EPIDEMIOLOGY OF DEAFNESS IN NEWBORNS OF NICU AND NECESSARY REHABILITATION

Thesis Submitted to

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH, BELAGAVI
(Formerly known as KLE University)

(Deemed-to-be University established u/s 3 of the UGC Act, 1956)
Accredited 'A' Grade by NAAC (2nd Cycle)
Placed in Category 'A' by MHRD (GoI)

For the award of the degree of

Doctor of Philosophy

In the Faculty of

MEDICINE

By

Dr. PRITI S. HAJARE

(Registration No: KLEU/Ph.D./10-11/D-11380(A)

Under the Guidance of

Dr. R. S. MUDHOL
Dean, Faculty of Medicine
Professor
Department of ENT &HNS,
J. N. Medical College, Belagavi.

JULY-2021

UNDERTAKING

I, **Dr. Priti S. Hajare,** hereby declare that the information and the data mentioned in my thesis entitled "**Epidemiology of deafness in newborns of NICU and necessary rehabilitation"** belongs to me and is original.

I am aware of definition of plagiarism as detailed below:

- An act or instance of using or closely imitating the language and thoughts of another author without authorization and the representation of that author's work as one's own, as by not crediting the original author.
- A piece of writing or other work reflecting such unauthorized use or imitation.
- The deliberate or reckless representation of another's words, thoughts or ideas as one's own without attribution in connection with submission of academic work, whether graded or otherwise.

I hereby declare that the thesis prepared by me is original-one and does not involve plagiarism anywhere. In case at a later stage it is found that I have indulged in plagiarism, then I am solely responsible for the same and the Institution is at liberty to take any disciplinary action against me including cancellation of dissertation or any other penalties imposed by the University.

Signature of the Research Scholar

Date:

Place: **Belagavi**

PLAGIARISM REPORT

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH
(Formerly known as KLE University)
(Deemed-to-be-University established u/s 3 of the UGC Act, 1956)
ಕೆ.ಎಲ್.ಇ. ಎಕ್ಯಾಡಮಿ ಆಫ್ ಹಾಯರ್ ಎಜ್ಯುಕೇಶನ ಆ್ಯಂಡ್ ರಿಸರ್ಚ್
(ಕೆ.ಎಲ್.ಇ. ವಿಶ್ವವಿದ್ಯಾಲಯವೆಂದು ಮುಂಚೆ ಗುರುತಿಸಿದ)
(ವಿ.ಧ.ಆ.ಕಲಂ 3ರಡಿ ಸ್ವಾಯತ್ತ ವಿಶ್ವವಿದ್ಯಾಲಯವೆಂದು ಸ್ಥಾಪಿಸಲ್ಪಟ್ಟಿದೆ)
Accredited 'A' Grade by NAAC (2nd Cycle) Placed in Category 'A' by MHRD (GoI)

Ref. No. KAHER/AA/21-22/D- 081221001 8th December 2021

[redacted]

percentage of **7%** which is within the acceptable limit of 10%.

To obtain the comprehensive report of the plagiarism test, research scholar can send a mail to **diracademic@kledeemeduniversity.edu.in** along with the Registration Number, Name of the Scholar, Name of Guide/Co-guide and title of the thesis.

DIRECTOR Deemed-to-be University ACADEMIC AFFAIRS

Dr.(Mrs.) Roopa M. Bellad
Director, Academic Affairs

To,

Dr. Priti S Hajare
Part-Time Ph.D. Scholar, 2010-11 Batch
Faculty of Medicine
[redacted]

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH, BELAGAVI
(Formerly known as KLE University)

(Deemed-to-be University established u/s 3 of the UGC Act, 1956)
Accredited 'A' Grade by NAAC (2nd Cycle)
Placed in Category 'A' by MHRD (GoI)

COPYRIGHT DECLARATION

We hereby declare that **KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH, BELAGAVI, KARNATAKA,** *shall have the rights to preserve, use and disseminate this thesis in print or electronic format for academic/research purpose.*

Signature of Candidate

Dr. Priti S. Hajare
Ph.D Research Scholar
KAHER,
Belagavi-590010

Signature of Guide

Dr. R. S. Mudhol
Dean, Faculty of Medicine
Professor, Dept of ENT & HNS
J. N. Medical College, Belagavi

Place : Belagavi
Date :

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH, BELAGAVI
(Formerly known as KLE University)

(Deemed-to-be University established u/s 3 of the UGC Act, 1956)
Accredited 'A' Grade by NAAC (2nd Cycle)
Placed in Category 'A' by MHRD (GoI)

DECLARATION

I hereby declare that the thesis entitled "**Epidemiology of deafness in newborns of NICU and necessary rehabilitation."** *is a bonafide and original research carried out by me under the guidance of* **Dr. R. S. Mudhol**, *Professor, Department of ENT & HNS, J. N. Medical College, Belagavi. The thesis or any part thereof has not formed the basis for the award of any degree/fellowship or similar title to any candidate of any University.*

Dr. Priti S. Hajare
Part-Time Research Scholar
Department of ENT & HNS,
JNMC

Place : Belagavi
Date :

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH, BELAGAVI
(Formerly known as KLE University)

(Deemed-to-be University established u/s 3 of the UGC Act, 1956)
Accredited 'A' Grade by NAAC (2nd Cycle)
Placed in Category 'A' by MHRD (GoI)

CERTIFICATE

This is to certify that the thesis entitled **"Epidemiology of deafness in newborns of NICU and necessary rehabilitation."** *is a bonafide and genuine research carried out by* **Dr. Priti S. Hajare**, *for the award of degree of* **DOCTOR OF PHILOSOPHY** *in faculty of Medicine under my supervision and guidance.*

Place : Belagavi
Date :

Signature of Guide
Dr. R. S. Mudhol
Dean, Faculty of Medicine
Professor, Dept of ENT & HNS
JN Medical College,
KAHER, Belagavi

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH, BELAGAVI
(Formerly known as KLE University)

(Deemed-to-be University established u/s 3 of the UGC Act, 1956)
Accredited 'A' Grade by NAAC (2nd Cycle)
Placed in Category 'A' by MHRD (GoI)

CERTIFICATE

This is to certify that the thesis entitled "**Epidemiology of deafness in newborns of NICU and necessary rehabilitation**" *is a bonafide and genuine research carried out by* **Dr. Priti S. Hahjare** *under the guidance of* **Dr. R. S. Mudhol,** *Professor, Department of Anatomy, J. N. Medical College, Belagavi.*

Place : Belagavi
Date :

Dr. N. S. Mahantashetti
Pricipal,
JN Medical College,
KAHER, Belagavi

ACKNOWLEDGMENT

I take this opportunity to thank each and everyone for their support and encouragement in completing my research work successfully.

At the outset, I would like to express my deepest gratitude to my guide **Dr. R. S. Mudhol,** Dean, Faculty of Medicine and Professor, Department of ENT AND HNS, J. N. Medical College, Belagavi; for his guidance, constant encouragement and critical evaluation throughout my work which helped me to complete my research work. I am really grateful and indebted in many ways for his personal interest and enthusiasm towards this study.

I am grateful to **Prof. (Dr.) C. K. Kokate,** Former Vice Chancellor and **Prof. (Dr.) Vivek A. Saoji,** Honourable Vice Chancellor, KLE Academy of Higher Education and Research, for giving me an opportunity to pursue my research work.

I also express my gratitude to **Dr. V. D. Patil,** Former Registrar and **Dr. V. A. Kothiwale**, Registrar, KLE Academy of Higher Education and Research for providing the requisite institutional facilities throughout my research.

I extend my gratitude to **Dr. (Mrs) Niranjana S. Mahantashetti,** Principal J. N. Medical College, and Professor, Dept of Paediatrics for giving her full support for conducting research and **Dr. M.V. Jali, MD, CEO,** KLEs Dr. Prabhakar Kore Hospital and MRC Belgaum for his support and help and providing institutional facilities to complete my research work.

I express my sincere thanks to **Dr. B. P. Belaldavar,** Professor & Head of the Department of ENT and HNS, J. N. Medical College. I thank **Dr. A. S Harugop**,

Professor and former HOD, **Dr. Vinita Metgudmath, Dr. Shama Bellad** and all other **collegues** for their constant encouragement and help.

I thank Dept of Paediatrics, **NICU staff members**, my Audiologist and my department supporting staff for their constant help.

I sincerely thank **Dr. N. K. Tyagi,** Professor and Head and **Dr. J. B. Prasad**, Asst Prof of the Department of Epidemiology and Biostatistics, KLE Academy of Higher Education and Research, for guiding me throughout the work.

I thank**, Dr, P. V Patil, Dr.Daksha Dixit** and **Dr. Roopa Bellad** for their valuable suggestions and guidance.

My deep and sincere gratitude for my husband **Dr. Santosh Hajare**, my children **Sachi** and **Shlok**, my mother in law **Mrs. Sulabha D. Hajare** for their continuous help, support and faith in me throughout. Finally I dedicate this work to my parents Late **Shri. Praveen** and **Smt. Shakuntala Jain** for their unconditional love and support in achieving my dream.

Date: **Dr. Priti S. Hajare**

Place:

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

ACOG	American Congress of Obstetricians and Gynecologists
ANC	Antenatal Period Diseases
AUC	Area Under Curve
ABR	Auditory Brainstem Response
ASSR	Auditory Steady State Response
AABR	Automated Auditory Brainstem Response
BOA	Behavioural Audiometry
BERA	Brain Stem Evoked Response Audiometry
CDC	Centers For Disease Control and Prevention
CNS	Central Nervous System
CS	Cesarean Section
CHL	Conductive Hearing Loss
CMV	Cytomegalovirus
Db	Decibels
DPOAE	Distortion Product Evoked Otoacoustic Emissions
EHDI	Early Hearing Detection and Intervention
ECMO	Extracorporeal Membrane Oxygenation
ELBW	Extremely Low Birth Weight
HL	Hearing Loss
IUGR	Intrauterine Growth Retardation

ID	Iron Deficiency
JCIH	Joint Committee on Infant Hearing
LBW	Low Birth Weight
NPPCD	National Program for Prevention and Control of Deafness
NICU	Neonatal Intensive Care Unit
NHS	Newborn Hearing Screening
OAE	Otoacoustic Emissions
PCHL	Permanent Childhood Prevalence Loss
RBSK	Rashtriya Bal Swasthya Karyakram
ROC	Receiver Operating Characteristic
SNHL	Sensorineural Hearing Loss
SPSS	Statistical Package for Social Sciences
THS	Targeted Hearing Screening
TORCH	Toxoplasmosis, Others, Rubella, Cytomegalovirus, And Herpes
TEOAE	Transient Evoked Otoacoustic Emissions
UNHS	Universal Newborn Hearing Screening
VLBW	Very- Low Birth Weight
WBN	Well Baby Nursery
WHO	World Health Organization

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

Background:

Hearing loss in infants is a prevalent yet neglected problem, especially in developing countries like India. Hearing loss negatively impacts the speech and language development of the child and affects various aspects of life. It is estimated that 0.3 to 15 babies per 1000 experience permanent hearing loss. The babies in neonatal intensive care unit (NICU) have higher rates of hearing loss due to the presence of additional risk factors.

Objectives:

The study's main aim is to screen the NICU babies for hearing loss or deafness through a hospital-based Newborn hearing screening (NHS) program. The objectives of the study were to assess the incidence and associated risk factors of deafness in NICU babies and provide necessary rehabilitation to the children identified with hearing loss.

Methodology:

This prospective cross-sectional study was carried out in the NICU and maternity wards of KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum. A total of 798 babies from NICU (n = 402) and Well Baby nursery (WBN) (n = 396) underwent hearing screening using two-staged screening protocol as per Joint Committee on Infant Hearing (JCIH) guidelines with Distortion product Evoked Otoacoustic Emissions (DPOAE) and Brain stem Evoked Response Audiometry (BERA).

Results:

During the initial DPOAE screening, 311 from NICU and 383 from WBN passed the test and during the second DPOAE screening, 80 out of 91 NICU babies and 10 out of 13 WBN babies passed the test. A total of 11 NICU and 3 WBN babies underwent BERA and confirmed hearing loss was detected in 5 babies (4 NICU and 1 WBN). The incidence of hearing loss is10 per1000 in NICU babies and 2.5 per 1000 in WBN babies. NICU babies exhibited more risk factors like infection, treatment with aminoglycosides, mechanical ventilation, craniofacial anomalies, neurological factors and associated syndromes which were not noted in WBN babies. Risk factors like low birth weight, prematurity, low APGAR score was noticed in both NICU and WBN babies. Family history of deafness ($p<0.001$) was a common significant risk factor in both groups. Maternal TORCH infection ($p<0.01$) and hyperbilirubinemia ($p<0.001$) were associated with hearing loss in NICU babies. In contrast, anaemia ($p<0.01$), intermediate APGAR score ($p<0.05$) was significantly associated with hearing loss in WBN babies whereas absence of maternal illness ($p=0.004$) reduced the risk of hearing loss. Our study showed a high incidence rate of hearing loss in NICU babies with high risk factors as well as WBN babies with few or no risk factors. Audiological intervention using hearing aids was provided to 4 out of 5 children identified with hearing loss and underwent sign language training later. Necessary education about rehabilitation was provided to the parents.

Conclusion:

Our results strongly recommend that Universal Newborn Hearing Screening (UNHS) rather than high-risk-targeted screening be made a compulsory screening procedure to detect all the infants with hearing loss to minimize the deafness associated sequel in

the newborn. We conclude that the early detection of hearing loss and appropriate therapeutic intervention would improve the quality of life of children with hearing loss.

Keywords:

Hearing loss; Newborn; Neonatal intensive care units; Risk factors; Incidence rates; Language development; Hyperbilirubinemia; Aminoglycosides; Anaemia, APGAR score

INTRODUCTION

1.1 Background

"Blindness separates people from things, but deafness separates people from people", a famous quote by Helen Keller, implies the importance of hearing. Hearing is crucial for communication. Hearing enables us to talk to other people, listen to favourite music, assess any social cues, make us aware of dangers in the surrounding, etc., thus helping us connect with the world. On the other hand, hearing impairment, a partial or complete loss of ability to hear, severely affects many aspects of life, like communication, social and emotional skills impacting the quality of life.[(1)] Moreover, the mental health of the hard of hearing or deaf person is hugely compromised, leading to stress, depression and anxiety.[(2)] Hearing loss affects more than 466 million people worldwide with unequal distribution i.e, higher prevalence in developing countries and low in developed countries. For example, World Health Organization (WHO) estimated that 63 million people in India have a significant hearing impairment.[(3)] Hearing loss is a common problem in children affecting 1 in 5 under 18 years of age.[(4)] If not diagnosed at the time of birth, hearing impairment in infants is usually not noticed until 2 – 3 years of age. The consequences of hearing loss in children from birth or during very early childhood have more impact, as hearing is essential for the development of the spoken language skills.[(5)]

The prevalence of newborn and infant hearing loss is high, with 0.3 to 15 per 1000 suffer from congenital or early childhood-onset permanent hearing impairment.[(6)] The developing countries which fall under low and middle-income countries are reported to have higher prevalence rate of more than 10 per 1000 births and even higher in some regions. In contrast, the rate in developed or high-income

countries is usually <2 per 1000 babies.[7] This difference could be attributed to factors like poor health care system, high infection rates, consanguinity etc., noted in developing countries.[8] Likewise, a contrasting difference in hearing loss prevalence has been documented between NICU or high-risk babies and well babies. Various studies reported that neonates and infants with risk factors or in NICU usually have 7 to 10 times more chances of hearing impairment than babies without any risk factors. [9]

Hearing impairment in children could be due to various etiology. Nearly 50% of the hearing loss is genetically inherited (70% are non-syndromic and 30% syndromic).[10,11] Non-genetic factors that occur during prenatal (cytomegalovirus, Rubella infections), perinatal (birth asphyxia, low birth weight, hyperbilirubinemia ototoxic drugs), or postnatal periods (meningitis, trauma, chemotherapy, measles) are responsible for 25% of hearing loss.[12] The cause for the remaining 25% of hearing loss is idiopathic.[11] Apart from these causes, the presence of risk factors such as family history of deafness, NICU stay, craniofacial malformations, low APGAR score, prematurity etc., are higly associated with newborn and infant hearing loss. [13]

Hearing impairment has a serious effect on the child's learning abilities. Children develop speech and language skills in very early childhood. Auditory stimulus is essential for the proper development of synaptic connections in the auditory cortexs and the organization of auditory brain pathways.[14,15] These connections are formed within a critical window period, usually higher in the first two years of age when neural plasticity is greater and later decreases and finally becomes very minimal after six years of age.[16] Lack of auditory stimuli during this critical period results in poor synaptic connections and deficits in auditory pathways. Thus, the child with hearing impairment will display poor speech and language because of

this neurophysiological deficit caused by the lack of stimuli he/she failed to receive during the critical period.[17] Moreover, Synaptic pruning might prune away the weak synaptic connections within the auditory cortex, unless the synapses are strengthened by continuous auditory stimuli.[16] So it is imperative that the hearing loss is detected as early as possible.

Though the importance of hearing screening was projected earlier, there were no methods available for screening other than behavioral assessment, which is ineffective and highly variable in newborns.[18] But, in the last three decades, advancements in electrophysiological methods have facilitated sophisticated and accurate hearing screening in infants. With the advent of screening tools like Otoacoustic emmissions (OAE) and AABR (Automated auditory brainstem response), the NHS programs began to be implemented in many countries.

NHS programs aim to identify the newborn with any hearing impairment. NHS programs can be universal or targeted. Joint Committee on Infant Hearing (JCIH), an international committee dedicated to ensuring early identification and intervention of infants and young children with hearing loss, endorses UNHS to screen all newborns. The UHNS has a high chance of identifying most babies with hearing loss, unlike the targeted screening where only high-risk babies are screened, so infants who do not have any risk factors but have hearing impairment might be missed.[19] Many developed countries have adopted UNHS to screen newborns for hearing loss, as it has many advantages over targeted screening. However, the latter is highly recommended and practised in many developing countries due to resource constraints, where UNHS is not feasible.[20] Likewise, different screening tools are used for different screening context. For example, JCIH recommends only AABR screening

for NICU babies screening, while either OAE or AABR is recommended for normal babies.[13] Many studies use two-stage screening protocol, where OAE is the principal screening method and a second screening is by a highly sensitive AABR testing that could detect the auditory neuropathies as well, a condition that is missed in OAE detection.[21,22]

JCIH projects that the NHS programs should strive to meet the 1-3-6 benchmark - "screen the newborns or infants before 1 month of age, diagnose hearing loss before 3 month of age and start intervention before 6 month of age". The very essence of early identification is early intervention so that critical years of speech and language learning are not lost. Various interventions are available for infants with hearing loss. Depending on the need of the child, with consultation from the specialist, the families can choose the interventions needed. Some child may need medications or surgery to correct the hearing loss, whereas many might need audiological aids like hearing aids, cochlear or brainstem implants, or other assistive devices.[23] These interventions, along with language options like oral or sign language, will help the child acquire speech and language ability on par with children with normal hearing. Numerous studies provided evidence on the successful, positive language outcomes in hearing-impaired children who underwent early detection and early intervention. For example, Moeller et al. reported that children who received earlier intervention before 11 months of age demonstrated better vocabulary skills, language scores and verbal reasoning at 5 years of age than the children who received intervention at later ages.[24] Moreover, early intervention plays a significant role in improving the pragmatic language skills of the children, which are usually delayed or deviant in children with hearing loss.[25] It is shown that the children displayed a higher vocabulary quotient when the JCIH 1-3-6 benchmark was met.[26]

NHS programs are still not established in developing countries, especially from South East Asia and Sub-Saharan Africa. Some of these countries have NHS programs but still in infancy and not adopted nationwide.[27] Many countries do not have any national policies for hearing screening at all.[10] The National Sample Survey carried out in India, to determine the common causes of disability ranked hearing loss disability as 2nd and observed that nearly 7% of the people are born with a hearing disability.[28] The prevalence of newborn hearing loss ranges from 1 to 10 per 1000 births based on the various single centred studies from India.[29-31] Despite the high rate of hearing loss in children, there are no established NHS programs in the country. Though national policy for infant hearing screening exists and Government programs on for the same are in place, they are still in the developing phase and the reach of these programs are limited. NHS programs are being carried out in states like Kerala, Gujarat, Tamil Nadu and Goa. Still, only a few tertiary care hospitals carry out hearing screening in other states, which is minimal compared to the country's birth rate. The screening options in rural areas are scarce, a heavy setback in a country like India, where the population in rural areas is high.[32]

There are many limitations in the widespread use of NHS programs in our country. Lack of financial and infrastructure resources is a big hurdle in India,[33] where approximately 67,000 babies are born in a day.[34] In the present situation, it becomes impossible to screen all the newborns with the limited available resources. Moreover, deafness is often ignored and is not considered a priority issue in our society which is burdened with other life-threatening severe conditions. There is also a shortage of human resources, which is insufficient to meet the demands of a higher prevalence of hearing impairment in the country.[35] All these factors together restrict the initiation of UNHS programs in the country.

REVIEW OF LITERATURE

1.1.1 Hearing

Hearing is the ability to sense sound and is considered one of the essential senses primarily for communication. The process of hearing and understanding the sounds is mediated by the auditory system comprising of the peripheral (outer ear, middle ear, inner ear) and central system (brain stem and auditory cortex of the brain). The peripheral system collects the sound waves from the environment, amplifies the waves and transmits them in the form of vibrations that are then transduced into nervous impulses. The neurons in the auditory nerve carry these impulses to the central auditory system, where it is processed and perceived as the sound that we hear and understand.[36]

1.1.2 Hearing loss and Deafness

Hearing loss, the inability to hear sound, affects millions of people of all ages. WHO describes a person with hearing loss as "A person who is not able to hear as well as someone with normal hearing, i.e, hearing thresholds of 20 dB or better in both ears ". [37]

1.1.2.1 Prevalence of hearing loss

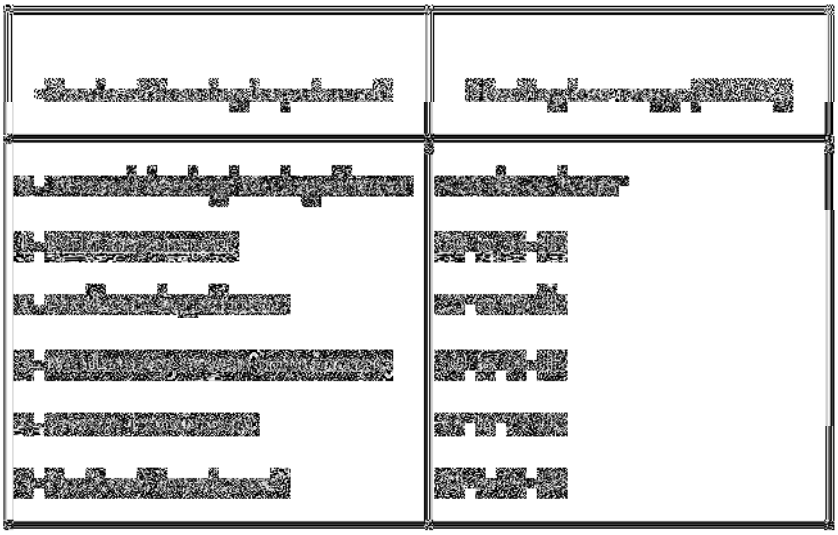
A systematic analysis conducted across 195 countries showed that hearing loss stands as the fourth leading cause of disability.[38] According to the WHO report (2018), the number of people with disabling hearing loss increased to 466 million people compared to 360 million in 2008 and is predicted to reach 900 million by 2050. [3] However, the "World Report on Hearing," released on 3rd March 2021, re-

estimated that in 2050, approximately 2.5 billion or 1 in 4 people would have some degree of hearing loss. The report also projected that the South and East regions of Asia and Sub-Sahara regions of Africa would have a high rate of hearing loss than other countries.[39] Moreover, severe hearing loss is more commonly noticed among elder people (over 70 years of age) and children (less than 5 years of age).[40] Hearing loss impacts many aspects of life, leading to psycho-social issues, thus considerably reducing the quality of life.

1.1.2.2 Degree of hearing loss

The minimal sound level required in order to be heard by a human ear is known as the hearing threshold.[41] The threshold for normal hearing is 20dB for adults and 15dB for children.[42, 43] The hearing loss can be differentiated into mild, moderate, moderately severe, severe or profound based on the hearing threshold, expressed as hearing loss range in decibels (dB HL), which is assessed by pure tone audiometers. The following table (Table 1) details the WHO proposed grades of hearing impairment based on audiometric dB HL ISO values.[44, 45]

Table 1: Grades of Hearing impairment



Usually, "hard of hearing" people have mild to severe hearing loss and can benefit from hearing devices as they might have some hearing ability in them. However, deaf people fall in the profound impairment category and mostly cannot hear any sounds.

Disabling hearing loss is defined as hearing loss if the hearing threshold is more than 40dB for adults and 30dB for children in the better hearing ear.[37]

1.1.2.3 Types of hearing loss

The types of hearing loss based on the function of the auditory system is as follows

1.1.2.3.1 Conductive hearing loss (CHL)

This type of hearing loss occurs due to the pathology of the outer or the middle ear or both. The dysfunction in conducting the sound from conductive regions of the ear i.e, outer ear, ear canal or middle ear to the inner ear results in CHL.[46] The audiogram of CHL patients shows that the bone conduction threshold is normal, but the air conduction threshold is higher, with the air-bone gap of 15dB or more.[47] In CHL, the sound intensity is reduced or altered depending on the region affected.

Various causative factors are responsible for CHL. The predominant external ear factors are blockage of ear canal due to too much cerumen or any foreign body, otitis externa, exostoses, osteoma, cysts and tumors. Perforated eardrum, chronic otitis media resulting in tympanosclerosis, cholesteotoma, otosclerosis, improper functioning of the eustachian tube and fluid build-up due to allergy or cold are the reasons for middle ear pathology.[48, 49] Apart from these, the malformations of

structures involved in sound conduction also result in CHL. Most of the CHL can be treated with medical or surgical intervention alone or in combination.

1.1.2.3.2 Sensorineural hearing loss (SNHL)

SNHL mainly occurs due to damage in the inner ear or the auditory nerve or the auditory areas of the brain.[46] The sensory component primarily involved in SNHL is the dysfunctional hair cells on the organ of Corti, whereas the cochlear nerve damage or malfunctioning of the auditory pathway are the neural factors responsible.[48] The audiogram shows both bone and air conduction are equally affected, indicating no air-bone gap.[47] The SNHL results in distorted perception and loss of intensity.[49]

The primary causes of congenital SNHL are perinatal infections, birth trauma, metabolic factors and syndromic/ non-syndromic genetic causes.[50]The adult-onset SNHL are due to infections, damage to the inner ear after exposure to loud noise (>140dB), head trauma, induced ototoxicity by drugs such as aminoglycosides, diuretics or by heavy metals like mercury, lead, etc., inner ear malformation, hereditary causes and tumors.[51,52] Presbycusis, a form of bilateral SNHL mainly noticed in older people, is known to occur because of the aging process.[53] Most permanent hearing losses are of this type. Though implantable devices might help, it is often difficult to correct SNHL.[51]

The configuration of hearing loss is based on the audiogram shape or pattern across the frequency spectrum.[54] The different shapes of the audiogram identify the hearing loss is at which frequency (high/ mid/ low). The configuration can be flat,

sloping, rising, U-shaped, tent-shaped and other shapes depending on the affected frequency.[55]

1.1.2.3.3 Mixed hearing loss

In this type of hearing loss both the conductive and the sensorineural structures are damaged or dysfunctional.[54] The audiogram shows elevated air and bone conduction with an air-bone gap of more than 10dB.[47] If the cause of hearing loss is more conductive, it can be treated like CHL, but if sensorineural regions are affected, treatment becomes more challenging.

1.1.2.4 Hearing assessment using Electrophysiological measures

A variety of electrophysiological screening measures may be employed for hearing screening. These include Otoacoustic emission (OAEs), Automated Auditory brainstem response (AABR) and a combination of OAE and AABR.[56] OAEs are acoustic signals generated from the outer hair cells within the cochlea reflecting the mechanical processes that provide an indication of the integrity of the cochlea.[57] Emissions are categorized by the presence or absence of an evoking stimulus with evoked OAEs (TEOAEs and DPOAEs) being of greater clinical significance.[58] TEOAEs are low intensity sounds originating from active amplification of outer hair cells of the cochlea, whereas DPOAEs are generated by two continuous pure tones presented simultaneously to the ear.[59] The AABR is a modification of the conventional ABR[60] which consists of an electrical response to auditory stimuli and assesses the peripheral auditory pathway from the ear to the brainstem.[61] Whilst OAEs are simple, fast, cheaper and non-invasive measures; they provide limited assessment of the auditory system and are negatively impacted by vernix and middle

ear fluid.[62] In contrast, the AABR provides more information regarding the auditory system and provides better detection of auditory neuropathy in infants; a condition which is missed entirely by OAEs. However, the AABR requires more knowledge and expertise to conduct in comparison to OAE testing; it is typically more costly and requires a longer test time to conduct;[62] all factors which may influence the implementation of a comprehensive screening program in different contexts. The JCIH, recommends either screening measure (OAE or AABR) for infants admitted to well-infant nurseries with AABR being the recommended choice for infants admitted to the NICU.[13]

1.1.3 Pediatric hearing loss

1.1.3.1 Prevalence Worldwide

Hearing loss is one of the most commonly observed disabilities in the pediatric population. Globally the hearing loss is observed in 70 million children (0-15 years of age)[40] and 34 million children have disabling hearing loss,[63] with higher rates noted in South Asia and Asia Pacific regions than North American and European countries.

Universal neonatal hearing screening programs have estimated that severe congenital hearing loss is witnessed in an average of 1 to 3 newborns in 1000 births and at least some degree of hearing loss is noted in 6 in 1000 births.[64,65] A worldwide survey on screening programs in 196 countries identified that the permanent childhood prevalence loss (PCHL) rate is 0.3 to 15 per 1000 babies.[6] The neonatal hearing loss prevalence rates vary across the globe, with higher prevalence estimates in low and middle-income countries, whereas the developed countries mark fewer children with hearing loss.

In high-income countries where NHS is mandatory, the PCHL is observed in an average of 1 in 1000 babies. Studies from these countries report a low rate of PCHL (per 1000 babies): 1.5 in the USA,[7] 0.6 in France,[66] 1.78 in Italy,[67] 1.7 in the UK,[65] 1.4 in Switzerland,[68] 0.68 in Australia,[69] 1.3 in Spain,[70] 0.87 in Belgium[71] and 1.1 in Netherland.[72]

In upper-middle-income countries, the prevalence is more than in high-income countries. Brazil, where NHS is followed on a large scale among the Latin American countries, reports hearing loss in an average of 2 per 1000 births.[73,74] A nationwide NHS program across various provinces of China detected the rate of hearing loss as 0.23% on average.[75] A Malaysian study conducted in a tertiary care hospital showed that 0.42% (4/1000) of children were identified to have a hearing impairment.[76]

There is a lack of data from lower-middle and low-income countries because of no screening. Whatever data available is mostly from single-center studies, which might not represent the whole population. Minimal studies from these regions show a high prevalence rate for PCHL. These countries have poor birth conditions, inefficient vaccination programs and high consanguinity rates contributing to higher PCHL incidence rates.[6]

The rates are between 19 to 24 per 1000 births in sub-Saharan Africa and South Asian regions.[77] The rate of congenital hearing loss per 1000 babies is 13 in Pakistan,[78] 23 in Indonesia.[79] In contrast, it is very high as 67 in 1000 babies in Nepal.[80] The data from African countries are almost nil. A pilot study from Nigeria reported the prevalence as 28 in 1000 live births.[81]

1.1.3.2 Indian population

Newborn hearing screening is not a mandate in most Indian hospitals. The neonatal prevalence rate in India is about 1 to 10 per 1000 births based on the various studies carried out in different cities.

The following table (Table 2) lists the neonatal hearing screening studies conducted in various places of India, including urban, semi-urban and rural areas.

Table 2: NHS studies in India

Author and Place of screening	Duration	Total screened	Prevalence (per 1000 babies)	Diagnostic tools used
Nagapoornima et al. 2007, Bangalore (29)	Sep 2002-Mar 2006	1764	5.2	2 step TEOAE & ABR, BOA
John et al. 2009 , Vellore (82)	Feb 2005-Jul 2005	500	6	2 step DPOAE & ABR
Neelam Vaid et al. 2009, Pune (83)	Aug 2005-Aug 2007	2621	4.96	2 step OAE & BERA
Paul et al. 2011, Cochin (84)	Jan 2003-Dec 2009	10,165	2.9	2 step OAE & ABR
Rai et al. 2013, New Delhi (85)	2009- 2010	500	8	2 step TEOAE & BERA
Augustine et al. 2013, Vellore (86)	Jan-Nov 2010	9948	4.1	2 step ABR, ASSR, DPOAE
Gouri et al. 2015, Bikaner (87)	Mar 2011-Oct 2011	415	43.4	TEOAE & ABR
Vignesh et al. 2015, Chennai (88)	May 2013 - Jan 2015	1405	1.42	TEOAE & ABR
Sharma et al. 2015, Karamsad (89)	Feb 2012-Jan 2015	2534	2	2 step DPOAE & BERA
Paul et al. 2016, Ernakulam (90)	Jan 2003-Jan 2015	1,01,688	1.6	2 step OAE & ABR
Kumar et al. 2016, Bangalore (91)	Jan 2007-Mar 2016	28,779	0.6	BERA

Kumar et al. 2017, Lucknow (92)	1 year	600	6.7	TEOAE, DPOAE& BERA
Singh et al. 2017, Jharkhand (93)	Jun 2015-Nov 2016	4356	2.07	2 step TEOAE & BERA
Parab et al. 2018, Maval (94)	Apr 2012-Apr 2015	8192	3.54	2 step TEOAE & ABR
James et al. 2018, Alappuzha (31)	Jul 2016-Jun 2017	4268	1.3	2 step OAE & BERA
Kaipuzha et al. 2019, Thodupuzha (95)	3 years	3121	4.8	3 step DPOAE & BERA
Nishad et al. 2020 , Mangalore (30)	12 months	1000	10	2 step OAE & BERA
Jacob et al., 2020 , Puducherry (96)	Oct 2016-Jul 2018	773	1.3	2 step TEOAE& BERA

TEOAE- Transient evoked Otoacoustic emissions; DPOAE- Distortion product otoacoustic emission; ASSR- Auditory steady state response audiometry; ABR- Auditory brainstem response; BOA- Behavioural audiometry; BERA- Brainstem evoked response audiometry

The variation in the prevalence rates in these studies could be due to many factors like different screening protocols (two-step or three-step protocols), the severity of Deafness, rate of false positives, inclusion criteria and difference in follow-up drop-out rates.

1.1.3.3 Incidence in NICU Vs. WBN

NICU provides critical care support to ill or premature babies. In contrast, healthy full-term babies will be in a well-baby nursery as they do not need any special monitoring or support. Hearing loss is comparatively higher in NICU babies than in well-babies as they possess many risk factors pertaining to PCHL.[9] A multi-centre study conducted in the USA identified that NICU babies had all the risk factors proposed by JCIH in higher percentages. In contrast, very few babies in WBN had risk factors for developing hearing loss.[97]

It has been observed that the prevalence of PCHL is almost seven times more in NICU babies than WBN babies in highly developed countries.[98] This is consistent with the data from the UK, which showed 6.3 times more[99] and from Korea, which observed 6.2 times more prevalence for high-risk babies admitted in NICU compared to well babies.[100] Connor et al. from Ireland showed a similar prevalence rate with 0.6 and 7.3 per 1000 in WBN and NICU.[101] A large Greece study established that the prevalence was 1.9% and 7% in their WBN and NICU, respectively.[102]

The rates vary between countries depending on the quality of perinatal medical care, which is comparatively better in developed countries. For example, a large-scale study from Turkey projected that 10.3 in 1000 NICU babies had hearing loss, whereas, in well babies, it was 2.8 per 1000.[103]

Various Indian studies have assessed the hearing loss rates in NICU vs. WBN, which identified 6 to 10 times more risk in NICU babies. The following table (Table 3) lists the incidence of hearing impairment in NICU/high-risk babies and WBN babies in Indian settings.

Table 3: Incidence of hearing impairment in NICU/high-risk babies and WBN babies from India

Global data indicates that the percentage of hearing impairment is significant in NICU babies. Pourarian et al. from Iran found that 13.7% of the neonates in NICU had hearing loss.[103] Stadio et al. from Brazil showed the prevalence in their NICU is 7.8%[104] and another Brazilian study reported it as 10.2%.[105] A newborn hearing screening program in a tertiary care hospital in Jabalpur, India, identified 8.8 % high-risk babies with hearing loss.[106] All these studies confirm that severe hearing impairment is higher in NICU babies than well babies; nevertheless, the rate of hearing loss in well babies is also a concern that should not be underestimated.

1.1.4 Risk factors for pediatric hearing loss

Multiple causes responsible for neonatal hearing loss have been identified. Nearly 50% of PCHL is due to genetic factors and environmental factors account for the rest.[107] Pediatric hearing loss could be congenital or acquired and occurs due to multiple factors. JCIH, in its second position statement, delineated the high-risk factors associated with hearing loss in neonates and children and the list has been amended by the addition of various risk factors in the subsequent position statements. The risk factor identification serves the following purposes:

1. To identify the infants who should be receiving audiological evaluation (mainly for targeted screening, especially in developing countries where UNHS is not adapted)
2. To identify the children who pass the neonatal hearing screen but later develop hearing loss (delayed on-set or missed hearing loss identification during NHS). Continuous surveillance of these high-risk factor neonates is recommended.
3. To identify infants who have passed the NHS but have a mild hearing impairment

The risk factors according to JCIH position statements[108] are discussed below

1.1.4.1 Family history

According to Centers for Disease Control and Prevention (CDC), nearly 60% of the hearing loss in children is due to genetic causes.[109] Family history of childhood hearing loss is an essential stand-alone risk factor as it increases the chance of hearing impairment by 6 times.[110] JCIH considers family history as a significant cause of permanent congenital hearing loss. Many studies have found a correlation between family history and congenital hearing loss.[111,112] A statistically significant

relationship between hearing loss in infants and family history was found in a study by Ohl et al., who examined 1461 infants through NHS program.[113] Sutton et al. showed that family history is one of the independent risk factors that can be added in the targeted screening of high-risk infants.[112] Neonates presenting with a family history should be screened at birth and monitored throughout their early childhood for any hearing abnormalities.

1.1.4.2 NICU stay

A stay in NICU for more than 5 days is one of the risk factors for hearing loss in infants. NICU babies are at high risk of hearing loss because of the illness/ condition for which they are in special care and (like low birth weight, hyperbilirubinemia, low APGAR) and for the treatments/ intervention, they receive during their stay (ototoxic drugs, mechanical ventilation).[9] Therefore, the chance of hearing loss in NICU babies is 6-10 times higher than in normal babies, and it is crucial to screen the NICU neonates for hearing loss.

1.1.4.3 Hyperbilirubinemia

Hyperbilirubinemia (bilirubin levels more than 20 mg/dl) occurs in more than half of the full term and more than 80% of the preterm babies.[114] The increase in the levels of bilirubin is usually mild,transient, and not harmful to the neonates. However, since it is liposoluble, high levels of bilirubin can cross the blood-brain barrier and cause damage to the central nervous system (CNS).[115,116] Higher bilirubin levels are neurotoxic, impacting the central auditory system in the brain.[117] Though the damage is reversible in many infants, some experience permanent hearing loss,[114] warranting the hearing screening.

1.1.4.4 Aminoglycoside administration

Aminoglycoside is one of the most common antibiotics used in infants for infection. Unfortunately, the aminoglycosides are cochleotoxic, damaging the hair cells resulting in permanent hearing loss.[118,119] Administration of aminoglycosides for more than 5 days is one of the risk factors for hearing loss. A study showed that nearly 87% of NICU infants received aminoglycosides for 1-24 days.[120] Therefore, NICU babies who passed the NHS but received aminoglycoside treatment must be under surveillance to develop any hearing loss in later stages.

1.1.4.5 Perinatal asphyxia

Neonates with asphyxia are considered to be at high risk for hearing loss or deafness, as asphyxia damages the cochlear hair cells and the brainstem nucleus, causing SNHL.[121]

1.1.4.6 Mechanical ventilation and Extracorporeal membrane oxygenation (ECMO)

Mechanical ventilation is a life-saving intervention in many critical neonates. However, mechanical ventilation lasting > 5 days acts as an independent risk factor for hearing loss.[122] Evidence shows that prolonged ventilation damages the peripheral segment of the hearing tract.[123]

Neonatal survivors of ECMO therapy develop hearing impairment at higher rates. For example, studies have identified that the rate of SNHL in ECMO is nearly 25%.[124,125] Moreover, these neonates also experience delayed-onset high-frequency hearing loss.[126,127]

1.1.4.7 In-utero infections

In-utero infections, especially TORCH infections which include Toxoplasmosis, Other (syphilis, varicella-zoster, parvovirus B19, hepatitis B, varicella-zoster virus (VZV), parvovirus B19, enteroviruses, lymphocytic choriomeningitic virus), Rubella, Cytomegalovirus (CMV), and Herpes infections have severe fetal consequences and are significantly associated with congenital hearing loss.[128,129]

Congenital CMV infections are the leading environmental cause of congenital hearing loss in infants accounting for 15-20%.[130] Neonatal CMV infections are typically acquired in utero with only 10% showing the symptoms.[131] Hearing loss is noted in both symptomatic and asymptomatic infants. Infants who survive the infection often have permanent early or delayed SNHL.[132] The etiology of hearing loss from CMV infection is not clearly understood. Studies show the inflammation of the cochlea and spiral ganglion which might be contributing to hearing loss in infants. [133] The infants identified with hearing loss with CMV infection needs to be monitored for the disease progression as the hearing loss worsens in later years.[134]

Another major cause of infant hearing loss is the in-utero Rubella infection. Congenital Rubella infection results in SNHL at birth and manifests in the first 6 months of life.[135] The mechanism of hearing loss due to Rubella infection is not known, but the virus damages the cochlea and organ of Corti.[136]

1.1.4.8 Certain birth conditions and findings

Birth conditions like craniofacial malformation, congenital microcephaly, hydrocephalus, temporal bone abnormalities have a well-recognized association with

hearing loss in neonates. Of all the birth anomalies, craniofacial malformations like cleft palate, abnormal pinna, abnormal ear canal, head trauma, choanal atresia, craniosynostosis, hemifacial microsomia, etc. account for 82% of hearing loss.[137]

1.1.4.9 Low APGAR score

A low APGAR score (less than 4 in the first minute and/or less than six in the fifth minute) is also a common indicator for hearing loss as they are often present with other risk factors like asphyxia, low birth weight. Hearing loss in infants with low APGAR score is 5 fold high and was independently associated with the development of neonatal hearing loss.[138,139]

APGAR scores that were recorded in participant files were classified as low (between zero and three), intermediate (between four and six) and normal (between seven and 10).[140] The classification of APGAR scores was also done in conjunction with a consultant paediatrician working in the neonatal wards at the time of data collection. These classifications were applied to the APGAR scores at five and ten minutes. The one minute score was not considered during classification as it has not demonstrated to be a predictor of clinical outcome;[140] and this was the position adopted by the current researcher.

1.1.4.10 Very- low birth weight (VLWB)

Birth weight was categorized into normal birth weight (≥2500 grams), Low birth weight- LBW (1500 grams -2499 grams), Very- low birth weight- VLBW (1000 grams-1499 grams) and Extremely low birth weight- ELBW (≤ 999 grams).[141] Infants with VLWB exhibit considerable hearing loss and are modulated by other

associated risk factors. Hearing loss in VLWB is mainly because of transient middle ear fluid accumulation. Both conductive and SNHL are observed in these infants.[142]

1.1.4.11 Mode of delivery

Cesarean section babies (CS) have two to threefold higher chances of experiencing hearing loss than vaginally delivered babies.[143,144] In addition, CS babies fail in the hearing screen due to the accumulation of amniotic fluid in the middle ear.

In case of assisted delivery using forceps, there is a chance of severe birth injury especially brain damage that can lead to deafness. Shaheen et al. showed that forceps delivery was independently associated with hearing loss in a cohort of 63042 infants. [145]

1.1.4.12 Consanguinity

Consanguineous marriage is practiced in many parts of the world, especially in South-East Asia consanguineous marriage accounts for 20-50% of the population. [146] The relationship between consanguinity and hearing loss is well established. Due to autosomal recessive inheritance, infant hearing loss is a common factor in consanguinity.[147] More than 80% of hereditary deafness is due to the inheritance of single recessive gene.[148] The chances that the infant inherits the recessive gene are higher if hearing loss runs in the family.[110] Even second and third-degree consanguinity has a considerable effect on hearing loss as there is 25% and 12.5% of gene sharing possibility in those cases.[149] Selvarajan et al. showed that the risk of hearing loss increases three times in second-degree consanguinity and two times in third -degree consanguinity.[110] Hereditary hearing loss is highly noticed in African,

Asian and Latin American countries where consanguineous marriage is a tradition. (150)

1.1.4.13 Gestation age

Guidelines by the American Congress of Obstetricians and Gynecologists (ACOG) were used to classify gestational age. Gestational age was classified into full term (39-40 weeks), early term (37-38 weeks), preterm (< 37 weeks) and late term (41 weeks).(151)

As the gestation age decreases, the prevalence of hearing impairment increases. Prematurity is not an independent factor but associated with other factors like NICU stay, noise exposure, ventilation, the risk increases.(152,153)

1.1.4.14 Antenatal period diseases

Some disease conditions or complications arising in pregnant women during the antenatal period are also considered risk factors for neonatal hearing loss. For example, iron deficiency anemia may affect the infant's neurodevelopment, including the central auditory system development, resulting in hearing impairment.(154) Studies suggest that the peak of iron uptake in the CNS coincides with the myelination peak, especially in the late fetal and early postnatal stages.(155) Iron deficiency (ID) is the most common nutritional deficiency globally, affecting about a quarter of the world population, and these numbers increase even more during pregnancy, reaching 59%.(156) In addition, some maternal and fetal pathologies may affect the newborn's iron stores, such as hypertension, diabetes mellitus, intrauterine fetal growth restriction, smoking during pregnancy, and premature birth, making the perinatal period especially susceptible to nutritional deficiency of this element.(157) ID anemia

has well-known impacts on CNS, such as reduced nerve conduction velocity and cognitive-behavioral changes[158] Iron deficiency without anemia, which has a prevalence 3 to 5 times higher than that of iron deficiency anemia, can also harm the CNS.[155] Oligodendrocytes, the cells responsible for myelin production, are particularly sensitive to iron deficiency and it has been shown that newborns submitted to intrauterine iron deficiency presented long-term CNS damage, reaching lower language scores and motor development at 5 years of age compared to those born with normal iron stocks.[157] Specific to the pediatric population, iron is involved in the central and peripheral nervous systems (nerve myelination, dendritic arborization) with downstream effects on development, learning, and long-term memory.[158]

Likewise, identifying preeclampsia as a significant risk factor for permanent hearing loss of the infant has been observed.[159,160]

1.1.4.15 Neurological factors

Neurological diseases in infants have a strong relationship with the development of hearing impairment. Intraventricular haemorrhage noted, especially in very-low birth weight premature infants, is responsible for hearing impairment in infants as their auditory pathways are affected due to the haemorrhage.[161,162]

1.1.4.16 Genetic disorders and other syndromes

It has been estimated that more than 400 syndromes and genetic disorders are associated with hearing loss. More common syndromes are Usher, Alport, Waardenburg, Stickler, to name a few. In many cases of genetic deafness, the reason is a single mutant gene.[77] For example, mutations in GJB2 (which encodes for

connexin 26, expressed highly in the cochlea) account for 30-50% of non-syndromic hearing loss.[163]

1.1.5 Preventable risk factors

Though multiple risk factors contribute to hearing loss in infants, it has been estimated that 60% of hearing loss is due to avoidable causes.

- TORCH, meningitis, mumps, measles and other chronic bacterial infections account for 31% of infant hearing loss.[164] Most of these infections can be prevented by strict adherence to immunization protocols and good hygienic practices. Prevention of primary infection in women limits the congenital CMV infection. In contrast, congenital mumps, measles and rubella infection can be significantly reduced if the mothers were vaccinated with MMR prior (135). Strengthening immunization programs plays a major role in effectively preventing these infections responsible for hearing loss. Likewise, chronic ear infections, when treated promptly, reduces the risk of hearing loss in children.

- Birth-related causes like prematurity, birth complication, low birth weight etc., contribute 17% of hearing loss.[164] Improved maternal and infant care, improved nutrition, better hygienic practices, promotion of safe birth etc., prevent these causes.[165]

- The use of ototoxic medicines in pregnant women and infants is responsible for 4% of hearing loss.[164] Limiting the use of these drugs and implementing ototoxicity monitoring protocol in infants prevents the hearing loss.[166]

- Maternal prenatal causes like particular disease conditions such as anaemia, hypertension contribute to 8% of infant hearing loss.[164] This can be prevented through improved maternal care.

- Several other risk factors can also be avoided to prevent infant hearing loss. Especially consanguineous marriage, which is responsible for hereditary hearing loss in infants, should be highly discouraged through awareness. Genetic counselling and antenatal screening can be carried out to rule out the chances of carrying any genetic causes for hearing impairment.[147]

Evidence state that the rate of hearing loss due to preventable causes are quite higher in developing and under-developed countries owing to poor maternal and neonatal care.[164] Strengthening the immunization programs, mental and child care programs can prevent childhood hearing loss to a great extent.

1.1.6 Hearing loss in relation to the number of risk factors

The higher the presence of risk factors, the higher the chances of hearing loss. Bielecki et al. observed in a cohort of 5282 infants that in children with one to four coexisting risk factors the probability of SNHL ranges from 3.15% to 5.56%, but for five or more risk factors the chance is almost double that amount (9.46–10.53%).[167] A similar observation was made by Ohl et al. in 1461 infants, who found that infants with two or more risk factors had a higher prevalence of hearing loss (6.1%) than the infants with one risk factor who showed lower hearing loss rates (1.6%).[113] These findings suggest that hearing loss can be reduced by reducing the risk factors of the infant. Many preventable risk factors can be avoided, limiting the number of risk factors thus reducing the prevalence of hearing loss.

1.1.7 Need for early identification and intervention of hearing loss

The first three years of life are critical for the natural and accurate acquisition of speech and language by a child due to higher plasticity of the sensory system development. Post that critical period language acquisition is complex.[168] Hearing the language is critical for learning and speaking the language, which is a challenge in children with hearing loss. Many deaf children who do not receive any language input in their earlier years show syntactic impairment.[169] If undiagnosed or lately diagnosed, hearing loss severely affects the speech and language skills of the child. This also has a tremendous negative impact on their social, emotional, cognitive development, mental well-being, family relationships and academic and workplace achievements. Before the NHS practice, hearing loss was identified at the age of two years and intervention was at an average of 3 years which is well beyond the critical period resulting in poor speech and language development.[170] NHS has reduced the diagnosis of hearing loss to 3months and intervention at 6 months of age, which means this earlier diagnosis and intervention aids in promoting communication and language skills. Studies show that children who receive early intervention show better language development, personal-social development and self-description.[171] Yoshihaga-Itano et al. identified that children screened early and received the early intervention had better language quotient and speech ability.[172] Cochlear implantation at earlier ages has significantly increased the children's spoken language ability.[173,174] A comprehensive study on the early identified children who received early treatment showed that most entered and managed mainstream education settings.[175] There is ample evidence that if the children are diagnosed and receive any intervention in the earlier stages of life show better speech and language ability.

Needless to say, NHS is essential to achieve this goal and improve the quality of life of children with hearing loss.

1.1.8 NHS Programs

1.1.8.1 NHS programs in other parts of the World

The NHS programs aim to identify hearing loss and deafness in newborns. The primary rationale behind these programs is earlier the identification, the earlier the intervention. This aids in improving speech and language development, thus increasing the quality of life of children with hearing impairment. The idea of infant screening dates back to 1964 when Marion Downs proposed and formulated a detailed guide for the newborn and infant hearing screening program. She also initiated and screened almost 10,000 infants in Denver using behavioural response testing, which laid the foundation for neonatal screening programs.[176]

In 1969, JCIH was established and the committee's first position statement was released in 1970. From then onwards, various position statements have been released over these 50 years (in 1973, 1982, 1990, 1994, 2000, 2007, 2013 and 2019), recommending the guidelines for NHS programs.[108] The following chart (Figure 1) describes the highlights of the JCIH position statements.

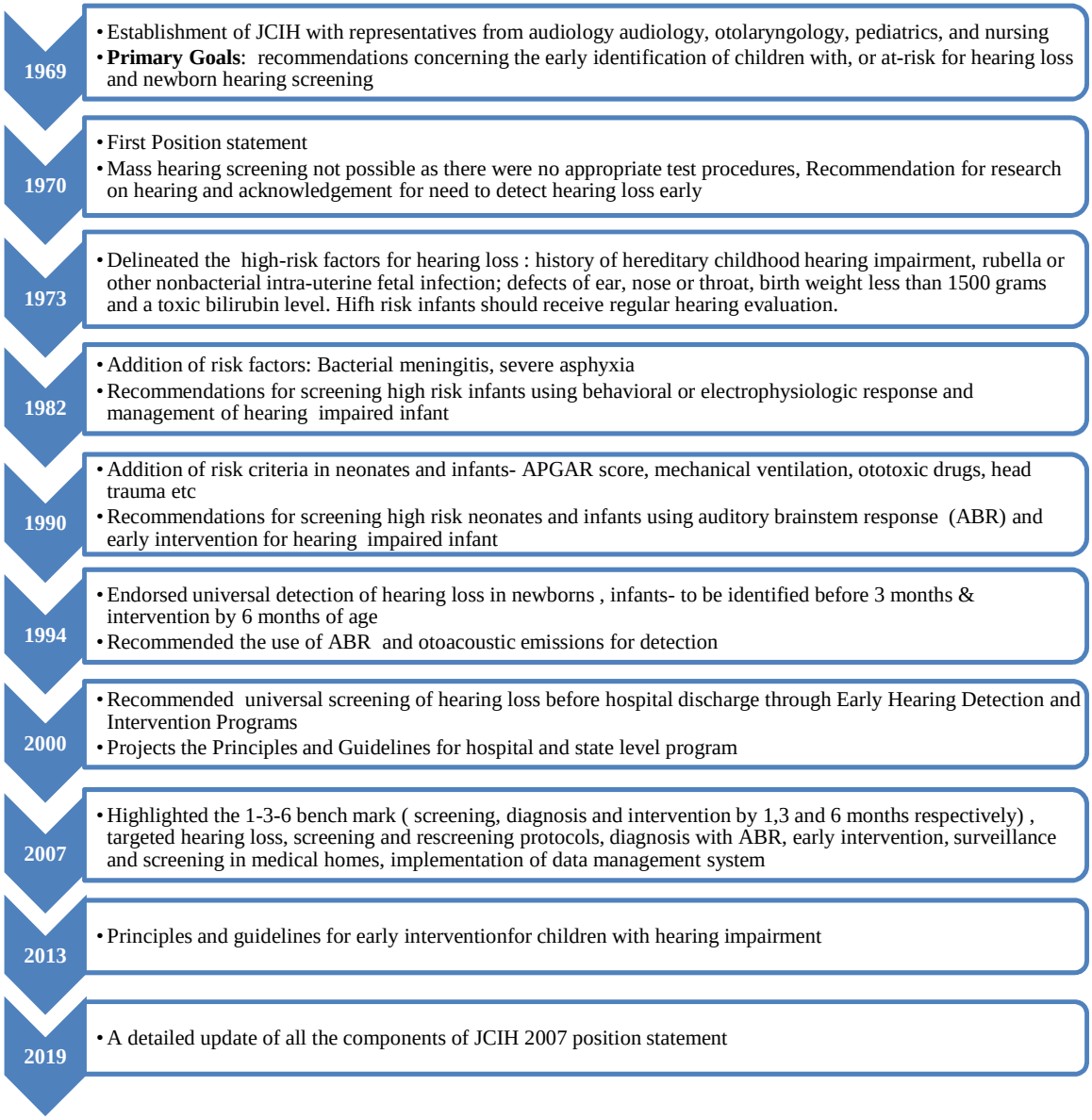


Figure 1: Timeline of JCIH Position statements

NHS started in the early 1990s in Hawaii, Rhode Island and Colorado.[163] Following the consensus statement by the National Institute of Health in 1993 and the JCIH statement in 1994 recommending universal screening, large-scale screening programs started in several places in the USA.[177] With the help of the NHS programs, the age of confirmation of hearing loss has reduced from 2 years of age to less than three months.[178]

In the past 30 years, the number of countries implementing mandatory NHS is increasing and has become standard medical care in resource-rich countries. As per a global survey, the whole nationwide UNHS was implemented in 33% of the countries in the world, with a high coverage rate of screening more than 85% of new born babies.[6] According to CDC data in 2018, in the USA 97% of newborn babies have been screened for PCHL within 30 days of their birth through Early Hearing Detection and Intervention (EHDI) Program.[179] UNHS in Qatar screens an average of 96.4% of babies born in the country.[180] The UK National Screening Committee confirms that 97.5% of newborns are screened within four weeks of age.[181]

NHS coverage is 50% to 85% in upper-middle-income countries. The situation is worse in lower-middle or low-income countries, especially in South Asian and Sub-Sahara African regions where NHS is not available or not widely practiced. Sixty four countries in these regions, accounting for 37.6% of the world population, are estimated to be screening 0-1% of the newborns mainly because of lack of adequate resources for screening.[6]

1.1.8.2 NHS programs in India

As in many developing countries, UNHS is not adopted in India due to various limitations like the shortage of audiologists, a high rural population, lack of infrastructure, funds and other resources.[182] Though there is no UNHS carried nationwide, many hospitals and few community-based programs are in place, but these programs' reach is minimal. In addition, Government programs for identifying infant hearing loss have been initiated in recent times. However, they are still not widely accomplished in many regions of the country, thereby lacking uniform coverage.

1.1.8.2.1 National programs for Hearing screening in India

India is the only country with a national policy for hearing screening among South East Asia and African countries.[10,81] The Ministry of Health and Family Welfare, Government of India, has launched two significant programs which target hearing screening, including infants.

1.1.8.2.1.1 National Program for Prevention and Control of Deafness (NPPCD)

With the objective of identifying, diagnosing, treating, rehabilitating and preventing hearing loss and Deafness, the National Program for Prevention and Control of Deafness (NPPCD) was launched in 2006. This program proposes strengthening ear care services at district and state levels in terms of human resources, diagnostic equipment, and training. Under this program, both institution-based screening and community-based screening were implemented in more than 200 districts. The institution-based screening was modelled after hospital-based programs, and community-based screening was targeted towards babies not born in hospitals. The community-based screening was conducted using a brief questionnaire and behavioural testing by a trained healthcare worker during immunization. Any infant who did not pass the screening was to be followed up at the district hospital for OAE and ABR testing, and if required, for rehabilitation.[33]

On World Hearing Day, in 2021, Dr. Harsh Vardhan, Union Health Minister of India, reported that NPPCD, with an annual budget of 35 crores, now covers 595 districts and will target over 6% of India's population with disabling hearing loss. [183]

1.1.8.2.1.2 (RBSK)

RBSK, which promotes Child Health Screening and Early Intervention Services, was launched in 2013 under the National Rural Health Mission. The program targets early detection and management of a set of 30 health conditions which falls under the following categories: birth defects, Diseases, Deficiency conditions and Developmental delays and Disability. Hearing impairment is also one of the health conditions covered in RBSK, where early detection, treatment and management are carried out free of cost. Community-based (for newborns), anganwadi-based (for 6weeks to 6 years of age) and school-based (for 6 to 18 years of age) screening are facilitated through dedicated health teams. As of now, hearing impairment screening is carried out in children above six weeks of age.[184]

1.1.8.2.2 Hospital-based programs

Though NHS at birth is not mandatory in India, many tertiary care hospitals have their own NHS programs. Table 2 gives the details of the NHS studies carried out in India. In 2003, a centralized newborn hearing screening facility was launched in cochin by the Indian Academy of Pediatrics, covering 20 major hospitals in the city, screening over 10,000 infants and still running successfully.[84] The screening equipment and personnel are shared between these hospitals, making it a cost-effective program that can be adopted in many parts.

Most of the screening programs are carried out in the Southern part of the country and screen many infants. In most of these studies, two or three-step protocols, including OAE and BERA (Table 2) are carried out according to international recommended guidelines by audiologists or trained screeners or ENT doctors. Though

there is the non-existence of more extensive studies, these single-site studies provide basic epidemiological data regarding infant hearing loss in our country.

1.1.8.2.3 Community-based Programs

In a country like India, where more than 72% of the population is from rural areas, community-based programs will have a better reach than hospitals.

Few community-based programs have been tried in India. Ramesh et al. used a mechanical calibrated noise maker to screen hearing impairment in neonates in rural Karnataka and validated against OAE and BERA. He reported that screening with the noisemakers and follow-up of the auditory and language skills till 2 years of age could be effectively used in resource-constrained settings to detect severe hearing loss in infants.[185]

A team from Chennai used the tele-ABR to diagnose pediatric hearing loss in rural areas of Tamil Nadu. They used 2 step DPOAE at the doorstep and kids with 'refer' results underwent either tele-ABR or testing in person in hospitals. It was observed that tele-ABR had 11% more follow-up rate compared to the other group. The authors suggest that this model be implemented in community-based programs for easy accessibility to the diagnostic tools.[186]

1.1.9 Screening strategy - Universal Vs. High risk-targeted screening

When NHS came into practice, newborns in the "High-risk register" who had risk factors for hearing loss (listed in JCIH position statements) were aimed to be screened. Over time, based on many studies, JCIH added additional risk factors in its position statements, which helped identify many infants with hearing loss. However, various studies provided evidence that more than 40% of the children with congenital

hearing loss do not exhibit any risk factors and are missed to be tested.[187,188] To identify all the children with hearing loss and the advent of reliable diagnostic tools, JCIH, in 1994, endorsed UNHS for the early identification and intervention.[108] UNHS has become a widely accepted screening strategy and has been practiced in many countries. Studies conducted in various parts of the world, support that UNHS would detect more cases than targeted screening. Brazil, which has adopted UNHS, reported that it is feasible to conduct these programs.[73] A Chinese study conducted in various provinces concluded that UNHS could be cost-effective in the long run.[189] A study from Egypt in 2013 compared the universal and high-risk targeted screening and showed that targeted screening would have missed 8% of the babies who did not have any risk factors but had permanent hearing loss.[190]

Nevertheless, UNHS is not a feasible and cost-effective approach in many developing countries.[33] In these countries, targeted hearing screening (THS) in high-risk infants is highly recommended. JCIH advocates that if THS only entails screening 5% of a birth cohort to achieve a yield of 50%, it is probably most suitable for a developing country.[191] THS studies in the UK showed that 55% of newborns had a family history and NICU admission as their risk factors in their infant population,[192] so analyzing the frequent risk factors in a particular population through pilot studies would help to narrow down the target infants. If not UNHS, at least THS should be established rather than a 'No Screen" policy so that a considerable number of infants with hearing loss could be detected.

Though the benefits of UNHS outweigh the cost, each country should decide on suitable NHS programs based on the evidence from pilot studies so that the infants could be benefitted.

1.1.10 Screening methods

A big leap in NHS occurred after the development of non-invasive physiological hearing screening tests. OAE and ABR are the two main screening tools used in NHS. These methods are automated, cost-effective and are feasible to practice, hence used widely in NHS programs. Depending on the protocol used, these tests can be used individually or in sequence.

1.1.10.1 Otoacoustic emission (OAE)

During the normal hearing process, the auditory stimulation moves the hair cells present in the cochlea resulting in the production of a very mild sound called OAE that echoes back to the middle ear. In case of hearing loss, OAEs are not produced. OAE test exploits this property and measures/records the OAE with the help of a microphone located in the probe and the test result, either a "Pass" or "Refer" is displayed on the screen.[193] Thus, OAE serves as an indicator of healthy cochlear function. Two different types of OAEs are available- **T**ransient Evoked Otoacoustic Emissions (TEOAEs) and Distortion Product Otoacoustic Emissions (DPOAEs). Though both these types are stimulus-evoked OAEs, there are notable differences between the two. For example, the status of the whole cochlea influences TEOAEs whereas, specific regions of cochlea generate DPOAEs. Another difference is in the frequency range- with TEOAEs effective in testing low and mid-frequency range(1000-4000Hz) and DPOAEs in the high-frequency range (over 4000Hz).[193]

OAE usually detects the function of the peripheral auditory system, especially the cochlear function, but it does not detect the neural component dysfunction.[194]

Moreover, the outer or middle ear dysfunction might affect the OAE, resulting in a Failed test even in normal cochlear function. OAEs are the primary screening tools used in the NHS as they are fast, cost-effective, highly-sensitive (85-100%), and specific (91-95%). The limitation of OAE is that they have high referral rates, i.e., more false-positive rates.[195]

OAE is performed by a trained technician while the infants are sleeping or calm. The test typically takes 10-15 min and both ears can be tested simultaneously. It is usually performed after 48 or 72 hrs of birth. If the testing room was noisy or if the infant was active, then the test has to be repeated.[196]

1.1.10.2 Auditory brainstem response (ABR)

The ABR test, also known as Brainstem evoked response audiometry (BERA), is considered a gold standard for assessing the hearing loss, especially in children.[197] It records brainstem electrical potentials in response to the auditory stimuli with the help of surface electrodes. An automated "pass" or "Refer" result will be displayed on the unit's screen.[198]

Unlike OAE, ABR can detect the dysfunction of the peripheral auditory system, auditory nerve and brainstem auditory pathways. In addition, less common auditory neuropathy can also be detected.[199] The sensitivity of the ABR is 100%, while specificity is 96-98% and reduced false-positive rates.[200]

ABR is usually performed by a trained technician. The test typically takes 10-15 min and both ears can be tested simultaneously.[196]

1.1.11 Screening Guidelines

The guidelines and protocols of the NHS are not universal. They vary substantially with the screening protocols, screening methods used (OAE alone/ AABR alone/OAE and AABR/OAE followed by AABR), age on the first screen (< 2 days/2-3 days/within 30 days/before discharge from the hospital), population (Universal/targeted), screening personnel, follow-up criteria, information management etc. Various guidelines are available, which are followed in many parts of the world. It is recommended that countries design their own protocols based on the budget, feasibility, and incorporating the key recommendations.

1.1.11.1 JCIH Guidelines

JCIH guidelines are more appropriate and can be adapted efficiently for any NHS program[201] JCIH position statements describe the guidelines for the development and implementation of NHS. The following are primary suggestions advocated by JCIH. [108]

- **Goals:** Achieve 1-3-6 benchmark
- **Screening protocol:**

  NICU Babies Screening: Only AABR. If "Fail", then refer for rescreening and complete audiological evaluation including diagnostic ABR

  Well- Baby Nursery Screening: Either OAE or AABR and a rescreen for the Fail babies using either technology before discharge or a two-stage protocol - OAE as first and ABR as a second screening test.

- **Quality indicators and Recommended Benchmarks:**

- **Other keynotes:**
  - Need for comprehensive otologic and medical evaluation of the infant after hearing loss confirmation
  - Immediate referral for intervention and appropriate interdisciplinary interventions should be offered
  - Continuous surveillance of communication development of the infants with or without risk factors
  - The programs should recognize evidence-based practices and build on the cultural beliefs, language, the tradition of the community

1.1.11.2 Indian Guidelines

Indian Academy of Pediatrics released the guidelines on newborn hearing screening in 2017.[202]

The key recommendations are as follows:

- **Goal**: Screen before 1 month of age, diagnose hearing loss before 3 month of age and start intervention before 6 months of age

- **Screening protocol**:
    - Two-stage- OAE as first and ABR as a second screening test
    - In case of OAE fail result, repeat OAE at 6 weeks / first immunization visit. If the result is Fail again, then proceed for the confirmatory test with ABR followed by audiological evaluation and intervention/ rehabilitation needed)
- **NICU Babies**: ABR testing to rule out auditory dyssynchrony/ auditory neuropathy
- **Special category babies**: Children with neonatal meningitis
- **Other keynotes:**

- Universal neonatal screening rather than targeted 'high risk' screening
- The program is to be coordinated by an audiologist
- All hospitals with level-3 neonatal care to have OAE and ABR facilities or use a portable OAE in multiple centers and refer abnormal cases for ABR to the nearest hospital.

1.1.12 Challenges in implementation of NHS

Though there are ample benefits of NHS, various limitations prevent the implementation of these programs in many countries, especially in resource-limited developing countries. The following are some of the difficulties faced.

1.1.12.1 Financial resources

The primary constraint for a free, government-funded NHS is the financial burden on the health care system. NHS is a comprehensive system that includes screening, diagnosis, treatment and management of infant hearing loss, which requires

high cost when it has to be implemented throughout the nation. In addition, the developing countries face the burden of many several fatal illnesses, which demands more financial allocations, thereby restricting the funding for NHS.[19] The cost of procurement of screening tools (2.5 lakhs for OAE and 5.3 lakhs for BERA), maintenance/service cost, the costs per tests (approximately 250 and 1300 rupees for OAE and automated ABR, respectively), cost of hearing aids and other interventions limits the reach of NHS all over the country.[203]

1.1.12.2 Infrastructure

Most rural areas have easy access to primary health centres only where it is difficult to establish the NHS due to the limited infrastructure.

1.1.12.3 Human resources

The developing countries have a shortage of human resources like an audiologist, ENT specialist, speech therapist pertaining to ear care and the available number of experts does not meet the demand. World report on hearing estimated the availability of these professionals in various regions and reported that there are only <10 per million ENT doctors, <5 per million audiologists and speech, language therapists in lower middle- income countries. The rates are <1 per million population in low-income countries. The report also indicates a considerable gap between demand and need; for example, New Delhi needs 1075 ENT doctors to diagnose hearing issues in children (0-15 years) but has only 650.[39]

Moreover, a dedicated trained person should be allocated for screening rather than an audiologist whose expertise can be used in consultation or monitoring, adding some extra cost to the program.

1.1.12.4 Awareness among health care workers

The NHS largely relies on primary health care providers like Pediatricians, Gynecologist, General practitioners, Nurses and midwives. Most of these health care workers, who can motivate the parents for hearing screening by providing the appropriate information, are not entirely aware of the various screening programs and updates on risk factors for hearing loss.[204,205] Many times even high-risk infants are not referred by a Pediatrician for hearing evaluation.[27]

1.1.12.5 Awareness among parents and Stigma associated

Many parents are unaware of the screening programs as they have not been informed or recommended. The unwillingness for hearing screening and beliefs that hearing loss will be cured as the child ages are the most common reasons for the failure of NHS.[206] Many parents do not give consent even to carry out hearing screening for their children. There is also a huge social stigma associated with hearing loss which often leads to parental denial to accept the interventions like hearing aids for their kids leading to social avoidance. Apart from this, many cultural and religious beliefs, especially among parents from lower socioeconomic status, prevent them from using any suggested intervention.[207]

1.1.12.6 Follow up

The success of the NHS program depends on the tracking and follow-up of the infants for timely intervention. The logistics and financial status of the parents may act as a barrier in this regard which drastically reduces the follow-up. Nearly 50% of infants with failed hearing screens drop out of the program and are lost to follow-up.[208] The initial recommendation by the JCIH was to ensure follow-up audiological

assessments every six months until three years of age. However, this was felt to place a great burden on audiologists, the system, and families, and may be economically unfeasible in developed contexts.[13,209] Hence, this recommendation for follow-up assessments was subsequently changed to at least one audiological assessment at 24-30 months for infants considered to be "low risk" (those that have passed the NHS but have a risk factor). More frequent assessments have been recommended by the JCIH for infants with risk factors that are known to be associated with late onset or progressive hearing loss such as cytomegalovirus or family history of hearing loss. The age at which these hearing re-evaluations are conducted and the number of these audiological evaluations for infants with risk factors should be decided based on the likelihood of delayed-onset hearing loss with each infant.[13]

1.1.13 Interventions and Rehabilitation

Hearing loss management in infants is a combined effort of pediatrician, otolaryngologist, audiologist and speech pathologist. Depending on the severity and etiology of hearing loss, various intervention options are available, which are described below.

1.1.13.1 Audiological intervention

Devices like Hearing aids, cochlear implants and other assistive devices have been successfully used in infants and provide extraordinary benefits to infants.

The hearing aid is an electronic device and the most commonly used device for hearing. It has a microphone that picks up the sound, an amplifier that amplifies the sound and a receiver that sends the amplified sound to the ear.[210] Hearing aids thereby assist the babies in hearing who have some residual hearing.[211] The Behind

the ear hearing aids are commonly recommended for the infants and children and can be used for all degrees of hearing loss. It can be used in infants as young as 2-3 months and with the digital versions, customization according to the baby's need is also possible.

In severe to profound hearing loss where hearing aids are insufficient, cochlear implants implanted in the inner ear that directly stimulate the auditory nerve are preferred.[211] Implantation is through surgery under general anaesthesia and proven to be without significant risk. The cochlear implant has an external sound processor that collects the environmental sound and passes it to the implant that conveys the sound directly to the nerve fibres in the form of electrical signals.[212] It can be fitted in children as early as one year of age.[213] After implantation, the audiologist and speech language therapist work closely with the child to help the child reach optimal adjustment of the device. Early implantation helps the child to attain normal speech.

Hearing assistive technology like frequency modulation (FM) system, which can be used along with these devices, helps to cut down the unwanted noise from the surrounding.[214]

1.1.13.2 Medical and surgical intervention

Hearing impairment because of ear infections (especially TORCH) can be treated with specific antimicrobial therapies or surgery to drain the fluid.[215] Intravenous Ganciclovir is widely used to treat hearing loss and restore hearing from CMV infection.[216] Other anti-viral drugs like valganciclovir, cidofovir and foscarnet can also be used as treatment options.[135,217] Insertion of tympanostomy tubes is the most common surgical procedure for recurrent ear infections, chronic otitis media

with hearing loss and middle air-fluid accumulation. These tubes reduce the frequency of ear infection and improve hearing ability in children.[218]

Conductive hearing loss due to external or middle ear malformations can be surgically corrected to improve the hearing ability[219] Various congenital ear deformities like cryptotia, microtia, ear hemangioma, Stahl's ear, Cup ears can be corrected through surgical techniques like reconstruction. Inner ear malformations like complete labyrinthine aplasia, rudimentary otocyst, cochlear aplasia, hypoplasia, incomplete partition of the cochlea etc. requires a surgical approach for placement of implants like cochlear implant/auditory brainstem implant or stapedotomy to manage the hearing loss.[220]

1.1.13.3 Communication skill development

Communication skill, precisely language skill, is essential for the child's social, cognitive, academic, and emotional development. Children with hearing loss often have difficulty learning the language, so the child would require audiologic habilitation for language acquisition.[221] Language skill development is usually based on the methods the family communicates with the child. Language options like oral language/sign language intervention result in better speech and language development in children.[222]

1.1.13.4 Family counselling

The child's hearing loss is unexpected news for the parents, causing stress/ depression, which may indirectly affect the child's social competence and cognition.[223] Therefore, family counselling is also an essential component in intervention programs. Counselling supports the parents in coping with their child's

hearing loss and helps them understand the impact of hearing loss on the child's development, choosing interventions and other necessary information.[224]

1.2 Justification of the study

Ideally, though all the newborns have to be screened for hearing loss, in a limited resource country like ours, at least targeted screening of high-risk infants/ NICU babies should be initiated as a first step. But, unfortunately, targeted screening also is not practised widely in our country, and thus the countrywide data on the epidemiology of deafness in NICU newborns is scarce. Moreover, studies from the state of Karnataka is minimal, and this insufficient data warrants necessary attention. In addition, according to WHO, 60% of infant hearing loss is preventable. Measures such as improved maternal and infant medical care, immunization, reducing the use of ototoxic drugs etc., ensures that hearing loss due to preventable causes is avoided. Screening of infants help us to narrow down the predominant avoidable causes of hearing loss in the population being screened.

In this context, the current study "Epidemiology of deafness in newborns of NICU and necessary rehabilitation" was carried out in KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum, which caters to North Karnataka, Southern Maharastra and Goa. An average of 3000 babies are born in the hospital and 450 babies require NICU care. The study's main aim is to screen the NICU babies for hearing loss or deafness through a hospital-based NHS program. The following are the specific objectives of the study;

Primary objective:

- To assess the incidence of deafness in NICU babies

Secondary objectives:

- To correlate the associated risk factors responsible for deafness
- To provide rehabilitation to the infant and necessary health education to parents to improve the quality of life
- To provide an appropriate platform for recommending UNHS as a compulsory screening procedure so as to minimize the deafness associated sequel in the newborn.

The study was conducted by screening the newborn babies from NICU and WBN, initially with OAE and later with ABR in the babies who failed the initial OAE screen. The risk factors present in the babies were also analyzed and correlated with the hearing impairment. The infants identified with deafness were provided with necessary rehabilitation. The study provides the incidence of deafness in NICU and WBN in a tertiary care centre and the risk factors associated with hearing impairment in newborns. The study's outcome justifies the critical need for the implementation of NHS programs to carry out early detection and intervention in infants with hearing impairment.

MATERIALS AND METHODS

Study place

The study was conducted in NICU and maternity wards of KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belgaum, North Karnataka.

Study design

The study was a prospective cross-sectional study. The study was approved by the institutional ethics committee

Study period

The study was conducted over a period of one year i.e, from July 2012 to July 2013.

Study population

All consecutive newborns admitted in NICU and WBN during the study period

Inclusion criteria

Newborn babies from NICU and maternity wards

Exclusion criteria

Neonates who were previously discharged, returned home and were readmitted to any of the wards were not enrolled in the study at the time of initial, in-hospital hearing screening.

Sample size

798 newborn babies were included in the study.

Methodology

- All the newborns admitted in NICU and maternity wards during the study period were screened for hearing impairment after obtaining consent from their parents.
- A total of 402 NICU babies and 396 normal babies from WBN were screened during this period. NICU babies were screened on the day of discharge and screening of WBN babies was carried on day 3.
- The following details, including demographic information and risk factors present, were documented in the preformed Performa.
    - Education of the parents
    - Consanguinity
    - Family history of deafness
    - Antenatal period diseases of the mother: anaemia, hypertension, preeclampsia, IUGR (intrauterine growth retardation)
    - Mode of delivery: normal, LSCS caesarean section, assisted delivery
    - Gestational age: preterm (37 weeks), early term (37 to 38 weeks), full-term (39 to 40 weeks)
    - Birth weight: very low birth weight (1000 to 1499 gms), low birth weight (1500 to 2499 gms), normal birth weight (≥ 2500 gms)
    - APGAR score: low (0-3), intermediate (4-6), normal (7-10)
    - Hyperbilirubinemia: significant (> 10), non-significant (≤ 10)
    - TORCH infection
    - Any other infections

- Aminoglycoside injection
- Mechanical ventilation
- Medication
- Craniofacial anomalies
- Neurological factors: intraventricular haemorrhage, other conditions
- Associated syndrome

- A two-stage hearing screening using DPOAE and ABR was employed; the primary screening procedure was DPOAE carried out with AuDX PRO portable OAE machine. If the result was "PASS", it was interpreted as no hearing impairment or normal auditory functioning. If the result was "REFER", which specifies poor auditory functioning, the parents were indicated for a follow-up screening usually repeated after 4 weeks for both NICU and normal babies. Screening was repeated immediately only for NICU babies at the first screening, even if it is "PASS/ REFER" result. Phone calls and letters were used to contact the parents reminding the follow-up. During the follow-up, those babies who passed the second DPOAE screening were discharged from the study, whereas the babies who failed the rescreening were referred for BERA testing. BERA was performed at 3 months of corrected age after all the diagnostic evaluation and the results were recorded. If the BERA test result was "REFER", hearing impairment was confirmed and early intervention was recommended.
- The following flow chart depicts the protocol employed in newborn hearing screening for NICU and normal babies.

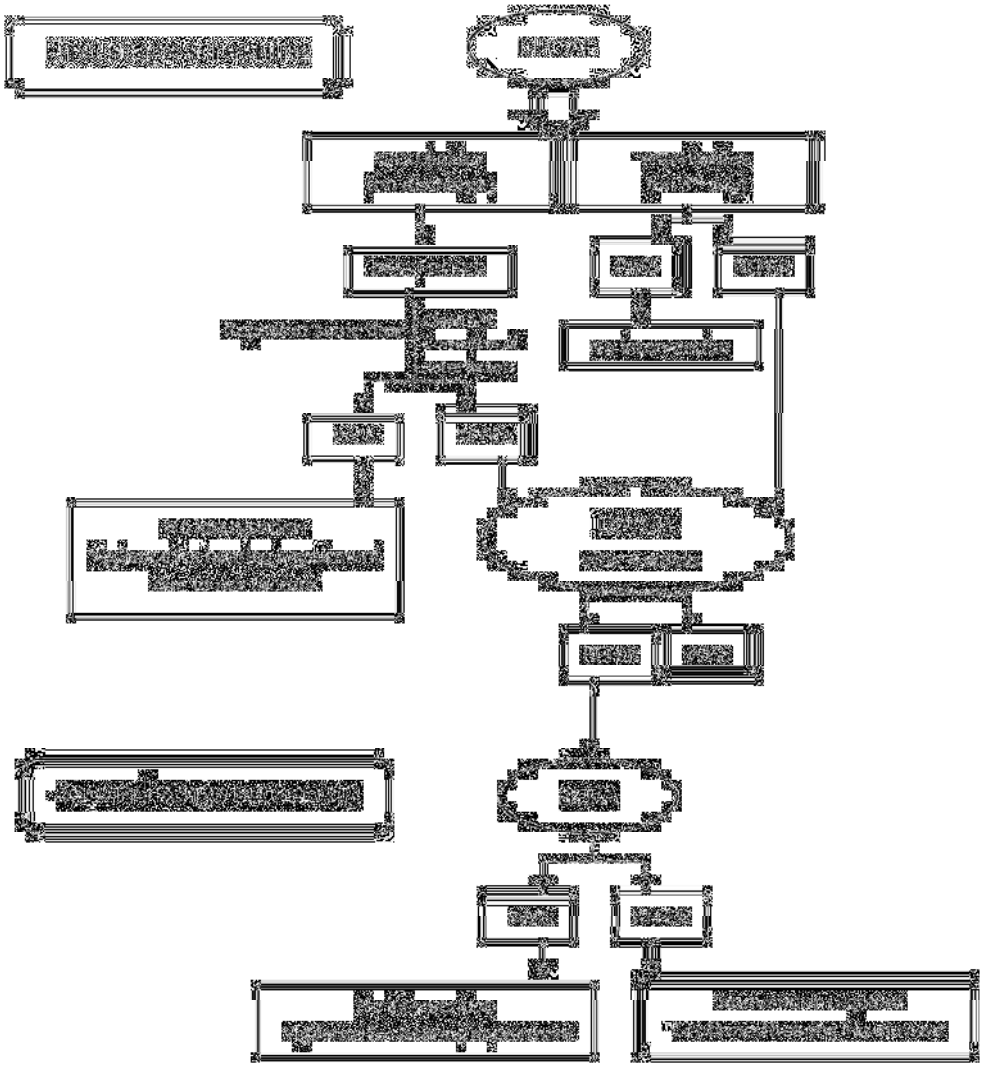


Figure 2: Newborn hearing screening protocol

- OAE test procedure:
    - The test was carried out in a quiet, noise-free environment, ideally when the baby was sleeping
    - Prior to the test, the babies were subjected to otoscopic examination for the confirmation of normal tympanic membrane
    - Wax or debris in the external auditory canal was cleaned
    - A proper size soft disposable ear probe tip was gently inserted into the external auditory canal to give a tight seal to keep out the

environmental noise, if any and ensures the signal is sent into the ear correctly.

- A sound stimulus at different frequencies i.e., 6000 Hz, 4000 Hz, 3000 Hz and 2000 Hz, was given.
- The automatic response of the stimulus, either a "PASS" or "REFER", was noted

- BERA test procedure:
  - The conducting electrodes (Standardised silver and silver chloride electrodes) were kept over scalp. Care was ensured that the surface of scalp was dry without oil.
  - As per the routine configuration of ABR electrodes, one of them was kept on vertex and inverting electrodes placed over the ear lobe of the ear which was assessed for the mastoid prominence. Another electrode was kept on the forehead for the purpose of earthing. This earthing electrode is necessary for proper functioning of the pre-amplifier.
  - After ensuring the baby was sleeping or in a quiet alert state, a click stimulus was applied (Frequency of click is 10/ second). For screening 40 dB and 70 dB was used**.** Impedance matching was done prior to the procedure.
  - After observing the appearance of the typical wave pattern (Wave I to V), average sum of potential evoked was noted (usually 2000 responses are used for newborns). The process is repeated with the opposite ear.
  - The result of the test was noted.

DATA ANALYSIS PLAN

The results were expressed as percentages (%). The statistical analysis was carried out using Statistical Package for Social Sciences [SPSS] for Windows Version 22.0 (Released 2013. Armonk, NY: IBM Corp). Univariate analysis was carried out with chi-square test. Multivariate logistic regression was used to assess the contributions of variables for hearing impairment in NICU and WBN babies. OR and 95 % CI were calculated wherever appropriate. The performance of the hearing screening test was assessed using the Receiver Operating Characteristic Curve (ROC) and the Area Under Curve (AUC). The level of significance was set at $P<0.05$.

RESULTS

Incidence and referral rate

During the study period, 798 newborns, i.e., 402 from NICU (50.4%) and 396 from WBN (49.6%), were screened for hearing impairment. In the preliminary first stage screening with DPOAE, out of 402 babies in NICU, 311 (77.4%) passed the test while 91 (22.6%) babies were referred, whereas out of 396 newborn babies from WBN, 383 (96.7%) passed the test and 13 (3.3%) babies were referred. The babies who obtained the "REFER" result were rescreened with DPOAE within 4-6 weeks. In the second DPOAE, 80 out of 91 NICU babies showed a "PASS" result and 11 got a "REFER" result and 10 out of 13 WBN babies were passed and 3 got referred. A second stage BERA testing performed at 3rd month of corrected age, for confirmation of hearing loss showed that 7 out of 11 NICU babies and 2 out of 3 WBN babies had normal BERA. Thus, the hearing loss was confirmed in 5 babies; 4 from NICU and 1 WBN baby.

The incidence of hearing loss in this cohort of all the infants screened is 6.3 per 1000 newborns screened. Out of 402 NICU babies screened, 4 were detected with hearing impairment accounting for 10 in 1000 NICU babies. In contrast, 1 baby out of 396 WBN babies had confirmed hearing impairment which is 2.5 per 1000 WBN babies screened.

The following figure (Figure 3) depicts the results of the two-stage hearing screening in the NICU and WBN babies.

Among the 798 neonates screened, 87% (694) babies passed the first DPOAE screening. Total referral rate in this stage is 13% (104 babies). Out of these 104 babies

who underwent second OAE, 86.5% (90 babies) passed the test, so the referral rate for BERA after this test was 13.5% (14 babies) which is 1.75% of the total population screened. BERA screening was done on these 14 babies and 5 were referred and the reference rate is 35.7% which constitutes to 0.63% of the total newborns screened.

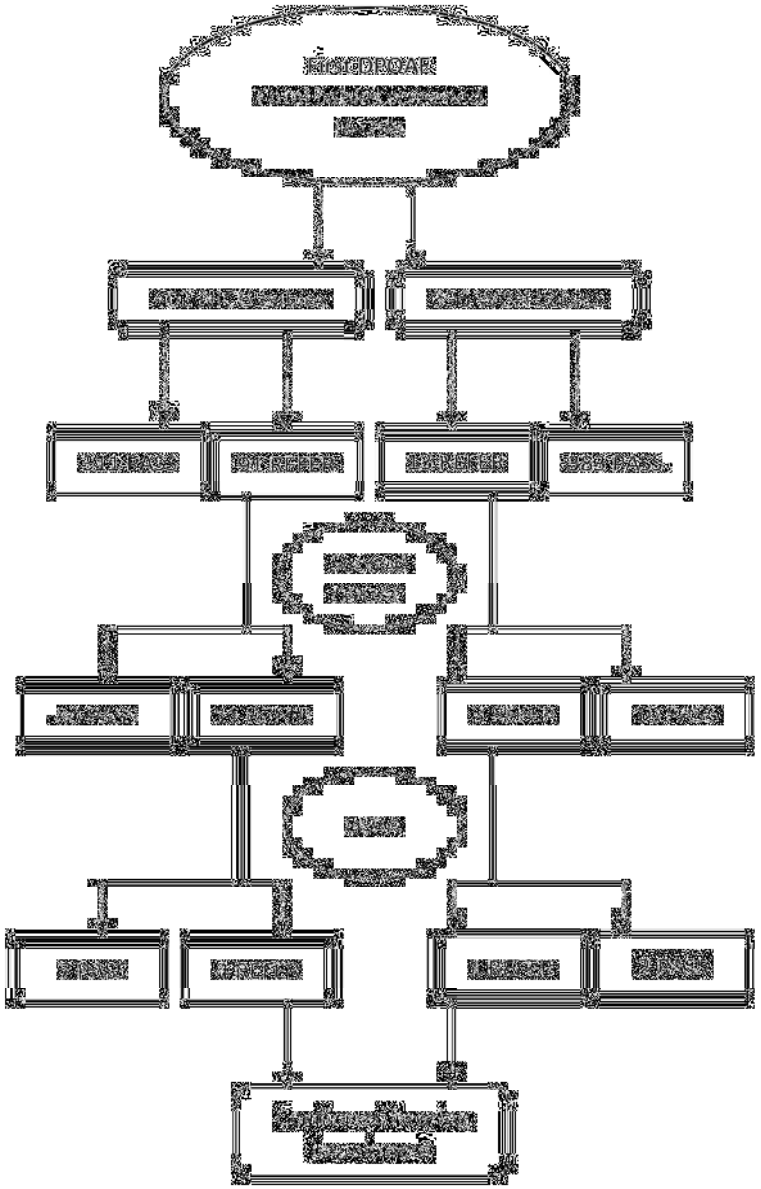


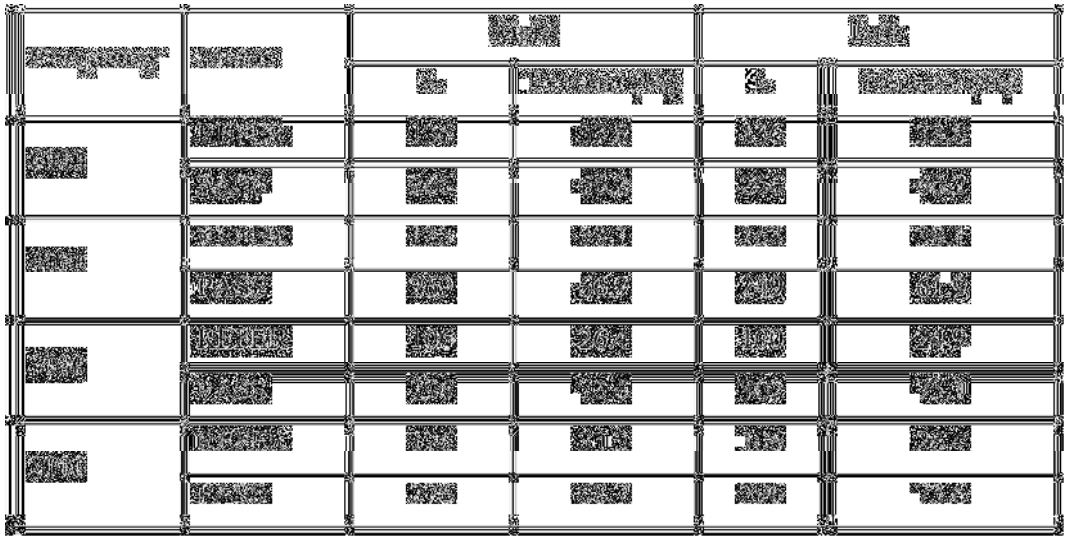
Figure 3: Result of Two-stage hearing screening program in NICU and WBN babies

Characteristics of NICU Babies

OAE screening outcomes

OAE was performed as a primary screening procedure in the study. The following table (Table 4) and (Figure 4) depicts the hearing screening outcome at different frequencies (6000, 4000, 3000, 2000 Hz) of the OAE screening in NICU babies.

Table 4: Initial OAE screening outcome at different frequencies in NICU babies



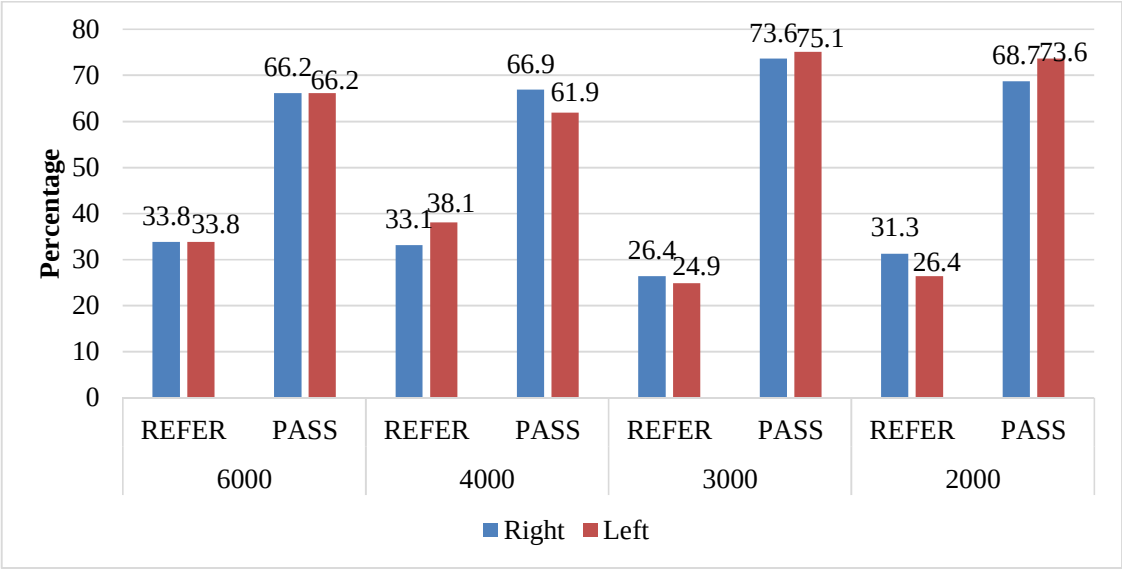
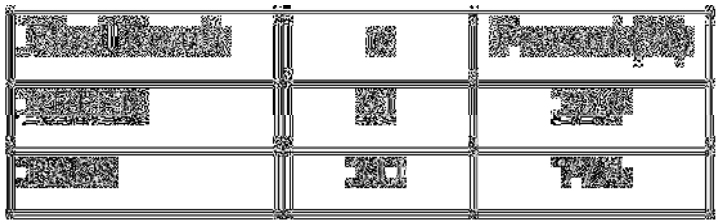


Figure 4: Initial OAE screening outcome of NICU babies at different frequencies

The following table (Table 5) and figure (Figure 5) shows the result of final OAE screening outcome in NICU babies.

Table 5: Final OAE screening outcome of NICU babies



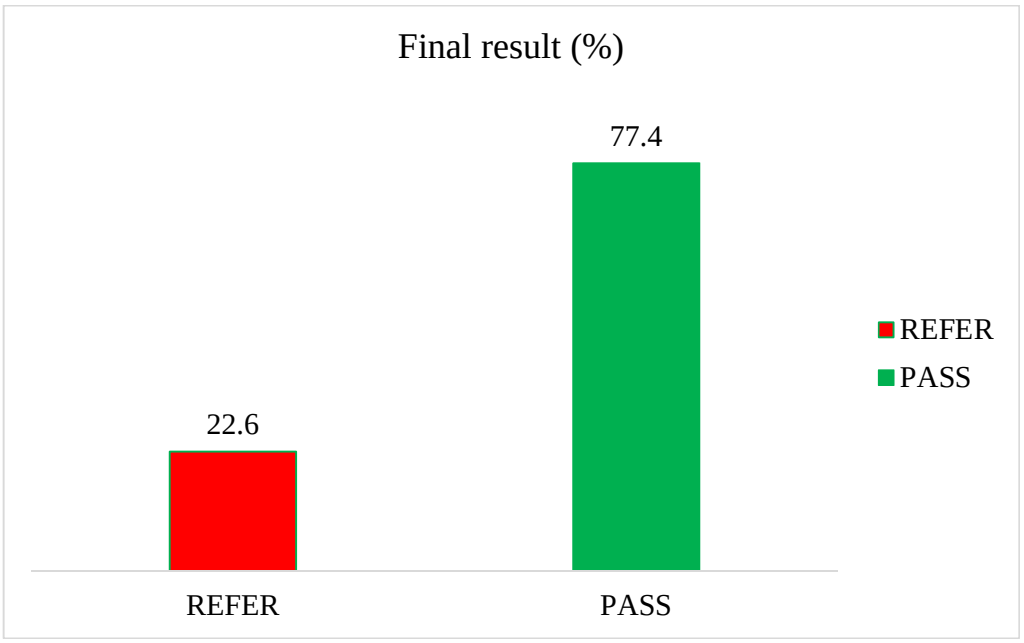


Figure 5: Final OAE screening outcome of NICU babies

Length of NICU stay

As NICU stay is by itself considered as one of the risk factors for hearing impairment, the days of NICU stay by the babies were analyzed. The (Figure 6) gives the percentage of babies by total days in NICU.

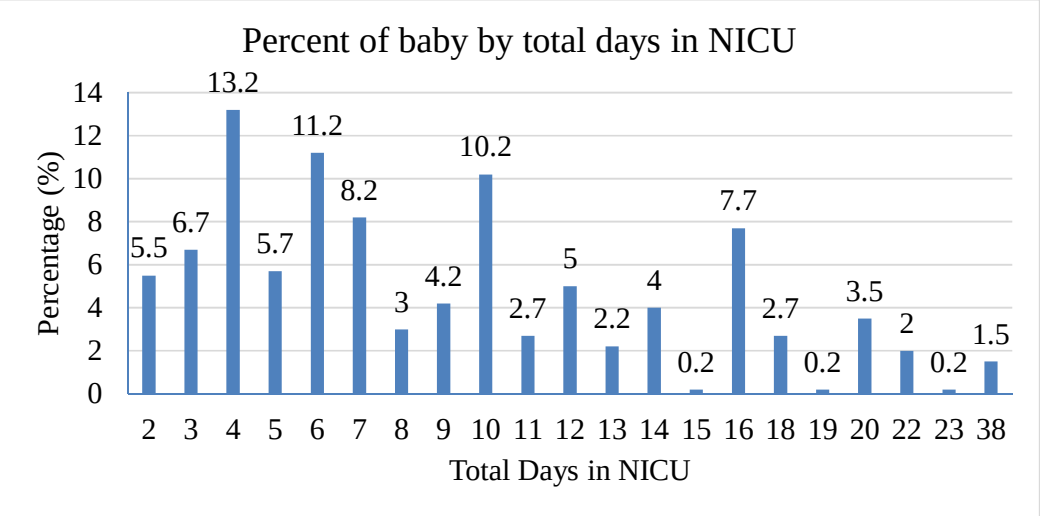
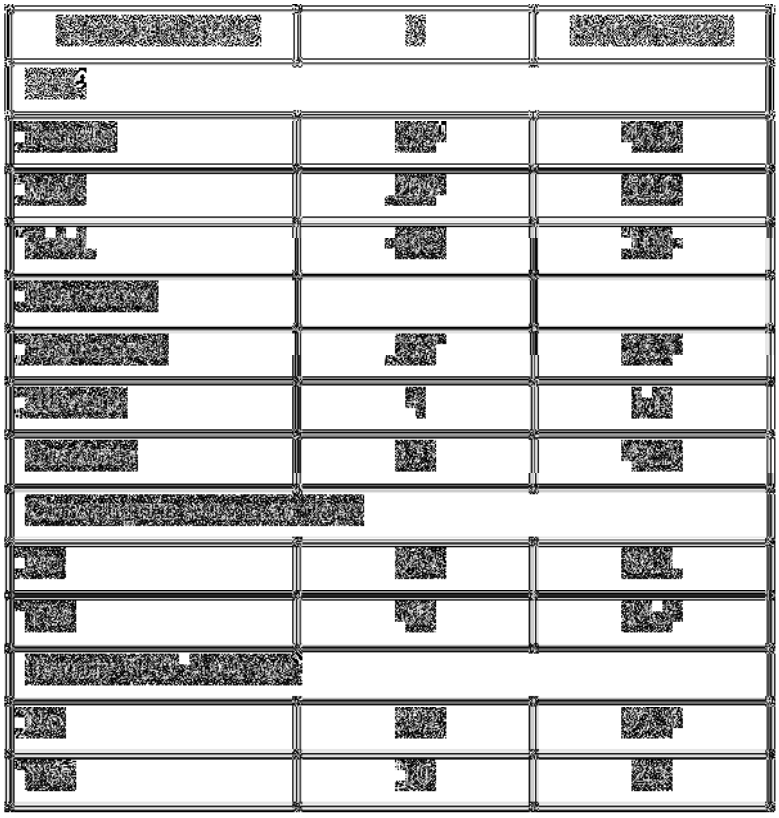


Figure 6: Percent of baby by total days in NICU

Demographic details

Of the 402 NICU babies, 52% were male and 48% were female babies. The ratio of male to female is 1.1:1. The educational status of the mothers showed that 42.5% had completed their graduation, 56.5% had finished high school and 1% were illiterate. The rate of consanguineous marriage was higher in the parents of NICU babies with 14.9%. Nearly 2.5% of the NICU had a family history of deafness. The demographic details of the NICU babies are presented in Table 6.

Table 6: Demographic details of the NICU babies



The distribution of demographic factors with respect to hearing screening outcomes among NICU babies is listed in Table 6. Univariate analysis of variables showed that of all the demographic details studied, family history of deafness was significantly associated with failed hearing tests in NICU babies (p=< .001). Other factors like sex of the baby (p = 0.263), Education of the mother (p = 0.279) and consanguineous marriage (p = 0.253) were not significantly associated with hearing loss.

Table 7: Hearing screening outcome in relation to the demographic factors in NICU babies

Characteristics	PASS		REFER		Total
	Count	%	Count	%	
Sex	χ^2 (df =1) = 1.25, p = 0.263				
Female	154	79.8	39	20.2	193
Male	157	75.1	52	24.9	209
Education	χ^2 (df =2) = 2.556, p = 0.279				
High School	180	79.3	47	20.7	227
Illiterate	2	50	2	50	4
Graduate	129	75.4	42	24.6	171
Consanguineous marriage	χ^2 (df =1) = 1.307, p = 0.253				
No	268	78.4	74	21.6	342
Yes	43	71.7	17	28.3	60
Family H/O deafness	χ^2 (df =1) = 19.269, **p <0.001**				
No	309	78.8	83	21.2	392
Yes	2	20	8	80	10

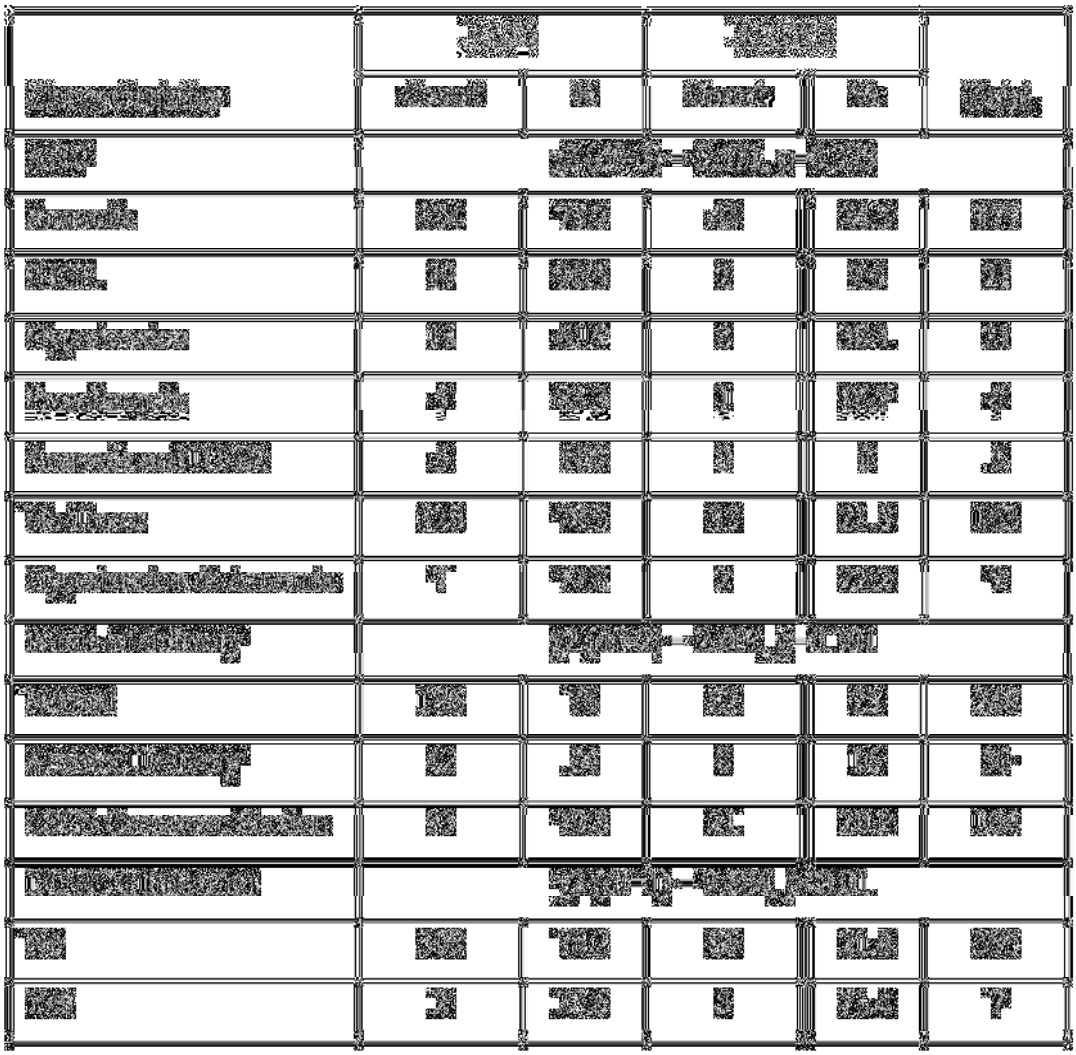
Antenatal factors

Maternal illnesses like anaemia, intrauterine growth retardation (IUGR), hypertension, preeclampsia was noted in 59.5% of the mothers of NICU babies, with anaemia indicated in 44% of the mothers, IUGR and hypertension in 5.2% and preeclampsia in 1.5%. Anaemia and IUGR were present in 1.2%, whereas anaemia and hypertension were found in 2.2% of the mothers. Maternal TORCH infection was observed in 1.7% of the mothers of NICU babies. Most of the NICU babies were delivered by normal delivery (61.7%); however, 12.4% were born by assisted delivery and 25.9% by LSCS Caesarean Section. Table 8 presents the distribution of antenatal factors in the mothers of NICU babies.

Table 8: Distribution of ANC factors in mothers of NICU babies

Statistical analysis to determine the association between hearing screening outcomes and ANC factors showed that maternal TORCH infection (p=<.01) was significantly associated with hearing impairment in NICU babies. However, maternal antenatal diseases and mode of delivery did not play a significant role in hearing loss in NICU babies (Table 9).

Table 9: Hearing screening outcome in relation to the ANC factors in mothers of NICU babies



Distribution of JCIH risk factors

JCIH has recommended a set of risk factors for infant hearing loss. The presence of these risk factors was analyzed in NICU babies. The distribution of JCIH recommended risk factors in NICU babies are as follows:

Infection was noted in 44.5% of the babies, with 46.8% were treated with aminoglycosides and 10.9% with other medications. 37.3% of the NICU babies were on mechanical ventilation. Five babies (1.2%) had craniofacial anomalies, 48 (11.9%) babies presented with some neurological factors including intraventricular haemorrhage and 4 babies (1%) had associated syndromes. The risk factors are listed in Table 10.

Table 10: Distribution of JCIH risk factors of NICU babies

Risk Factors	n	Percentage
Infection		
No	223	55.5
Yes	179	44.5
Aminoglycoside Injection		
No	214	53.2
Yes	188	46.8
Mechanical ventilation		
No	252	62.7
Yes	150	37.3
Medication		
No	358	89.1
Yes	44	10.9
Craniofacial Anomalies		
No	397	98.8
Yes	5	1.2
Neurological factors		
Normal	354	88.1
Other conditions	44	10.9
Intraventricular haemorrhage	4	1.0
Associated Syndrome		
No	398	99.0
Yes	4	1.0

On further analyzing the risk factors, it was found that high percentage of NICU babies were born preterm (82.1%), 15.7% were born early term and only 2.2% were full term babies. Similarly, 74.1% of the babies in NICU were under very low or low birth weight category. Normal APGAR score was observed in only 46% of the NICU babies, whereas the remaining 54% of babies had low or intermediate scores. Hyperbilirubinemia was present in 49 babies (12.2%). The following table lists the distribution of risk factors in NICU babies (Table 11).

Table 11: Distribution of other JCIH risk factors in NICU babies

Risk Factors	N	Percent (%)
Gestational age in Weeks		
Preterm	330	82.1
Early term	63	15.7
Full term	9	2.2
Birth weight Grams		
Very low	48	11.9
Low	250	62.2
Normal	104	25.9
APGAR score		
Low	56	13.9
Intermediate	161	40.0
Normal	185	46.0
Hyperbillirubinemia		
<=10	353	87.8
> 10 (Significant)	49	12.2

Preterm: <37 wks, Early term: 37 to 38 weeks, Full term: 39 – 40 weeks; Very low birth weight: 1000- 1499 grams, Low birth weight: 1500 to 2499 grams, Normal: ≥ 2500 gms; APGAR score- Low: 0-3, Intermediate: 4-6, Normal:7-10

The distribution of risk factors with respect to hearing screening outcomes among NICU babies is listed in Table 12 and Table 13.

Interestingly, risk factors known to cause hearing loss in neonates like infection, aminoglycosides treatment, other medications were not significantly associated with hearing loss. Likewise, other risk factors recommended by JCIH, such as mechanical ventilation, craniofacial anomalies, neurological factors and associated syndromes, did not contribute to hearing loss in NICU babies. Moreover, no association between hearing impairment and birth weight, gestational age and APGAR score was found. We found hyperbilirubinemia (p=<.001) was significantly associated with hearing impairment in NICU babies.

Table 12: Hearing Screening Outcome in relation to JCIH risk factors in NICU babies

Risk factors	PASS		REFER		Total
	Count	%	Count	%	
Infection	$\chi 2$ (df=1) = 0.133, p=0.715				
No	171	76.7	52	23.3	223
Yes	140	78.2	39	21.8	179
Aminoglycoside Injection	$\chi 2$ (df=1) = 0.676, p=0.411				
No	169	79	45	21	214
Yes	142	75.5	46	24.5	188
Mechanical ventilation	$\chi 2$ (df=1) = 0.994, p=0.319				
No	199	79	53	21	252
Yes	112	74.7	38	25.3	150
Medication	$\chi 2$ (df=1) = 0.158, p=0.691				
No	278	77.7	80	22.3	358
Yes	33	75	11	25	44
Craniofacial Anomalies	$\chi 2$ (df=1) = 0.872, p=0.351				
No	308	77.6	89	22.4	397
Yes	3	60	2	40	5
Neurological factors	$\chi 2$ (df=2) = 3.878, p=0.144				
Normal	271	76.6	83	23.4	354
Other conditions	38	86.4	6	13.6	44
Intraventricular haemorrhage	2	50	2	50	4
Associated syndrome	$\chi 2$ (df=1) = 0.013, p=0.910				
No	308	77.4	90	22.6	398
Yes	3	75	1	25	4

Table 13: Hearing Screening Outcome in relation to other JCIH risk factors in NICU babies

Risk factors	PASS		REFER		Total
	Count	%	Count	%	
Gestational age in Weeks	$\chi 2$ (df=2) = 0.009, p=0.996				
Preterm	255	77.3	75	22.7	330
Early term	49	77.8	14	22.2	63
Full term	7	77.8	2	22.2	9
Birth weight Grams	$\chi 2$ (df=2) = 2.607, p=0.272				
Very low	40	83.3	8	16.7	48
Low birth	187	74.8	63	25.2	250
Normal	84	80.8	20	19.2	104
APGAR score	$\chi 2$ (df=2) = 0.433, p=0.805				
Low	45	80.4	11	19.6	56
Intermediate	125	77.6	36	22.4	161
Normal	141	76.2	44	23.8	185
Hyperbillirubinemia	$\chi 2$ (df=1) = 29.495, p<0.001				
<=10	288	81.6	65	18.4	353
> 10 (Significant)	23	46.9	26	53.1	49

Independent risk factors associated with hearing loss in NICU

A multivariate analysis using logistic regression analysis was carried to identify the factors independently associated with hearing loss in the NICU babies. The variables independently associated with hearing loss in NICU babies were family history of deafness (p = 0.003), maternal TORCH infection (p= 0.022) and hyperbilirubinemia (p= <.001). The likelihood of having a hearing impairment is 12 times higher in NICU babies with a family history of deafness (OR 12.76, 95% CI 2.35-69.3), whereas maternal TORCH infection and hyperbilirubinemia increase the odds of hearing loss by 8 folds (OR 8.24, 95% CI 1.35-50.32) and 5 folds (OR 5.9, 95% CI 2.86-12.17) respectively. There is a 63% lower likelihood of hearing loss in NICU babies delivered by assisted delivery (OR 0.366, 95% CI 0.15-0.92). Other demographic, maternal factors and JCIH risk factors did not contribute significantly to the hearing loss in NICU babies in this study. The following tables (Table 14, Table 15, Table 16) shows the logistic regression analysis of the factors.

Table 14: Demographic factors of NICU babies

Characteristics	P value	Exp(B)	95% C.I. for EXP(B)	
			Lower	Upper
Age	0.699	1.009	0.966	1.053
Sex				
Female	0.731	1.102	0.635	1.912
Male				
Education				
High school	0.514			
Illiterate	0.468	2.55	0.203	31.987
Graduate	0.334	1.303	0.761	2.23
Consanguineous marriage				
No	0.132	1.744	0.845	3.6
Yes				
Family H/O deafness				
No	**0.003**	12.757	2.348	69.3
Yes				

Table 15: ANC factors of NICU babies

Variable	P value	Exp(B)	95% C.I. for EXP(B)	
			Lower	Upper
ANC				
Anaemia	0.521			
IUGR	0.117	0.266	0.051	1.395
Hypertension	0.311	1.821	0.571	5.807
Preeclampsia	0.632	0.578	0.061	5.457
Anaemia and IUGR	-	-	-	-
No illness	0.677	0.875	0.465	1.643
Hypertension and Anaemia	0.288	2.593	0.446	15.059
Mode of delivery				
Normal	0.096			
Assisted delivery	**0.033**	0.366	0.145	0.924
LSCS	0.428	0.767	0.397	1.48
TORCH infection				
No	**0.022**	8.242	1.35	50.318
Yes				
Medication				
No	0.220	1.738	0.718	4.204
Yes				

Table 16: JCIH risk factors of NICU babies

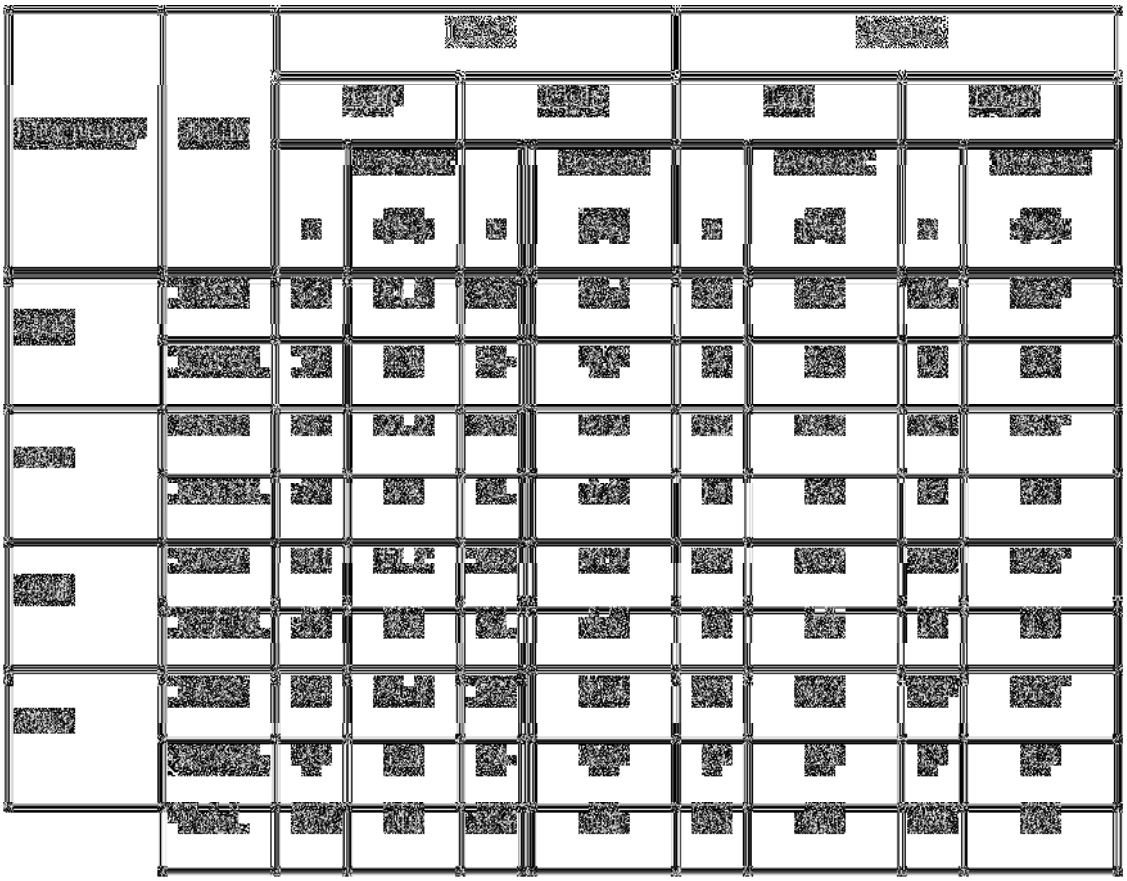
Risk factors	P value	Exp(B)	95% C.I. for EXP(B)	
			Lower	Upper
Gestational age (wks)				
Preterm	0.982			
Early term	0.873	1.07	0.466	2.457
Full term	0.891	1.151	0.152	8.719
Birth weight (gms)				
Very low	0.188			
Low birth	0.149	2.073	0.771	5.574
Normal	0.670	1.306	0.382	4.463
APGAR score				
Low	0.698			
Intermediate	0.444	1.42	0.579	3.478
Normal	0.407	1.496	0.578	3.874
Hyperbilirubinemia				
<=10				
> 10 (Significant)	**0.000**	5.903	2.863	12.171
Craniofacial Anomalies				
No	0.400	2.63	0.277	24.955
Yes				
Neurological factors				
Normal	0.165			
Other conditions	0.222	0.532	0.194	1.463

Characteristics of WBN Babies

OAE screening outcomes

OAE was performed as a primary screening procedure in the study. The following table (Table 17) depicts the hearing screening outcome at different frequencies (6000, 4000, 3000, 2000 Hz) of the OAE screening in WBN babies

Table 17: Hearing analysis by OAE at different frequencies in WBN group



The following table (Table 18) and figure (Figure 7) shows the result of final OAE screening outcome in NICU babies

Table 18: Final OAE analysis in WBN group

Final Impression	N	Percent (%)
PASS	383	96.7
REFER	13	3.3
Total	396	100

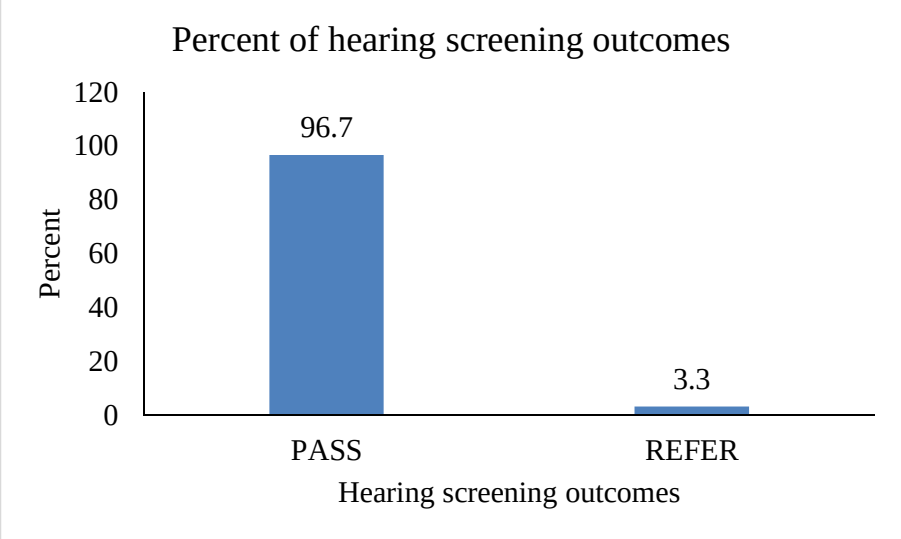


Figure 7: Percentage of final hearing analysis in WBN group

Demographic details

Of the 396 WBN babies, 52.5% were male and 47.5% were female babies. The ratio of male to female is 1.1:1. The rate of consanguineous marriage in the parents of WBN babies was 5.8 %. Nearly 2% of the WBN babies had a family history of deafness. The demographic details of the WBN babies are presented in the Table 19.

Table 19: Demographic details of the WBN babies

Demographics	N	Percent (%)
Sex		
Male	208	52.5
Female	188	47.5
Family history		
No	388	98.0
Yes	8	2.0
Consanguineous marriage		
No	373	94.2
Yes	23	5.8

The distribution of demographic factors with respect to hearing screening outcomes among NICU babies is listed in Table 20. Univariate analysis of variables showed that of all the demographic details studied, family history of deafness was significantly associated with failed hearing tests in WBN babies (p=< .001). Other factors like sex of the baby (p = 0.64), and consanguineous marriage (p = 0.13) were not significantly associated with hearing loss.

Table 20: Hearing screening outcome in relation to the demographic factors in WBN babies

Variables	PASS		REFER		Total
	n	%	N	%	
Sex	$\chi 2$ (df=1) = 0.219, p=0.64				
Male	202	97.1	6	2.9	208
Female	181	96.3	7	3.7	188
Family History	$\chi 2$ (df=1) = 12.129, **p<0.001**				
No	377	97.2	11	2.8	388
Yes	6	75	2	25	8
Consanguineous Marriage	$\chi 2$ (df=1) = 2.253, p=0.133				
No	362	97.1	11	2.9	373
Yes	21	91.3	2	8.7	23

Antenatal illness

Anaemia was indicated in 24.7% of the mothers, hypertension in 10.9% whereas 64.4% had no illness.

Most of the WBN babies were delivered by normal delivery (63.1%); however, 36.9% were born by LSCS Caesarean Section. The following table (Table 21) presents the distribution of antenatal factors in the mothers of WBN babies.

Table 21: Distribution of ANC factors in WBN group

Variable	N	Percent (%)
Maternal illness		
Anaemia	98	24.7
Hypertension	43	10.9
No illness	255	64.4
Mode of delivery		
Normal delivery	250	63.1
LSCS Caesarean Section.	146	36.9

Statistical analysis to determine the association between hearing screening outcomes and ANC factors showed that anaemia was significantly associated with hearing impairment in WBN babies ($p < .01$). However, other maternal antenatal diseases and mode of delivery did not play a significant role in hearing loss (Table 22).

Table 22: Hearing screening outcome in relation to the ANC factors in mothers of WBN babies

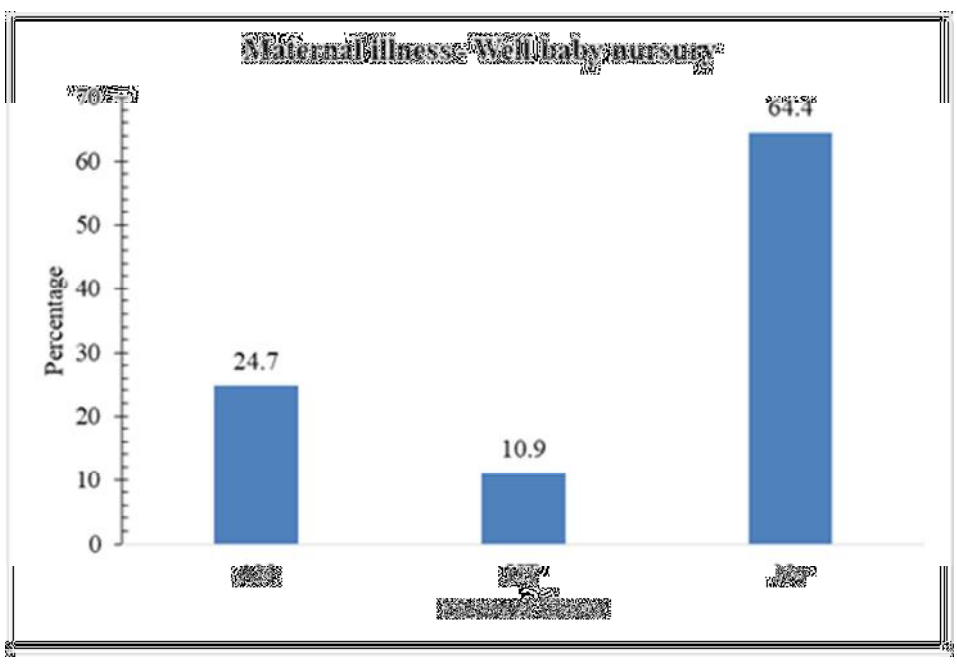
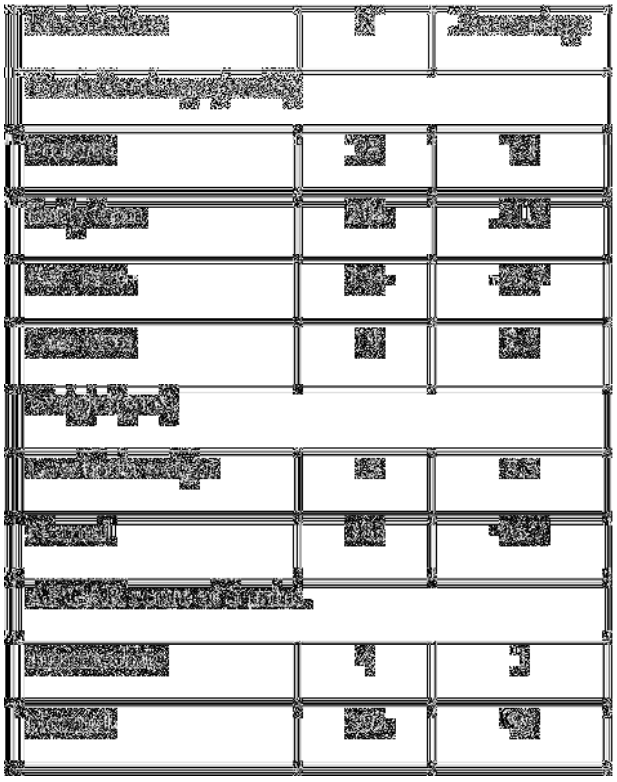


Figure 8: Shows the distribution of maternal illness factors in WBN babies.

Distribution of JCIH risk factors

The presence of JCIH risk factors was analyzed in WBN babies. The distribution of JCIH recommended risk factors in these babies showed that high percentage of WBN babies were born early term (51.5%), 38.9% were full term babies whereas, 7.1% were preterm babies and 2.5% were late term. Only 3.3% of the babies in WBN were under low-birth weight category. Normal APGAR score at 5 min was observed in 99% of the WBN babies, whereas only 1% of babies had intermediate scores (Table 23).

Table 23: Distribution of JCIH risk factors in WBN babies



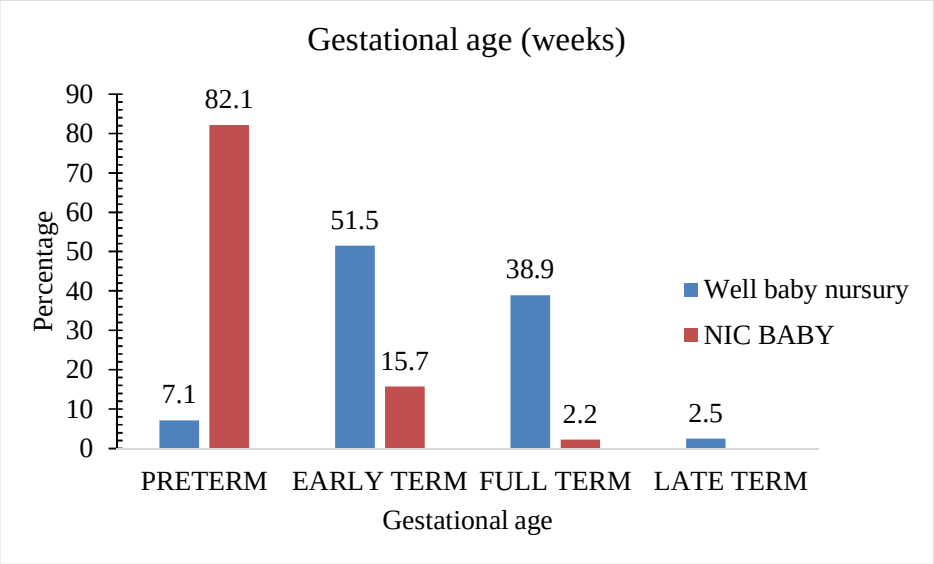


Figure 9: Distribution of gestational age in NICU and WBN babies

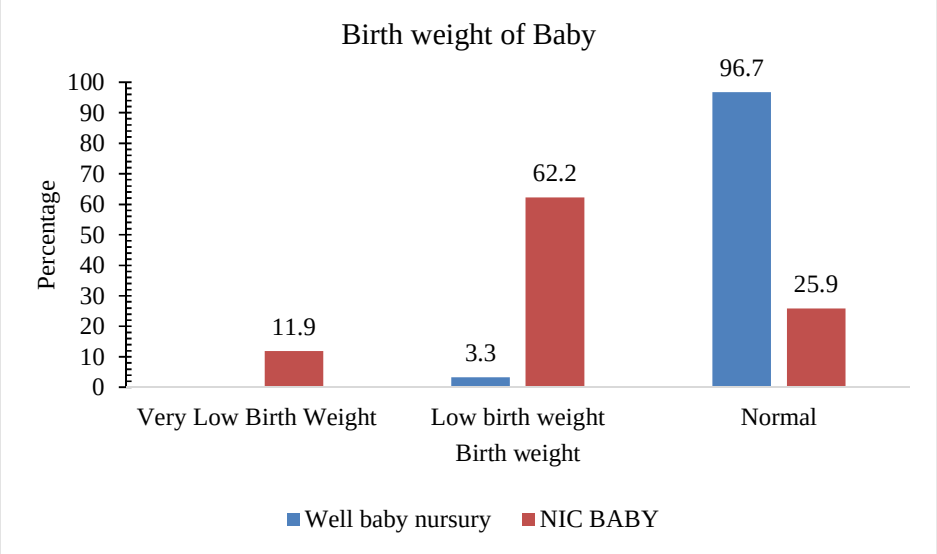


Figure 10: Distribution of birth weight in NICU and WBN babies

The distribution of risk factors with respect to hearing screening outcomes in WBN babies is listed in Table 24. Univariate analysis showed that risk factors recommended by JCIH, such as birth weight, gestational age did not contribute to hearing loss. We found intermediate APGAR score at 5min (p=<.05) was significantly associated with hearing impairment in WBN babies.

Table 24: Hearing Screening Outcome in relation to JCIH risk factors in WBN babies

Risk factors	PASS		REFER		Total
	n	%	n	%	
Gestational age (weeks)	$\chi2$ (df=3) = 3.941, p=0.268				
Preterm	27	96.4	1	3.6	28
Early term	194	95.1	10	4.9	204
Full term	152	98.7	2	1.3	154
Late term	10	100.0	0	0.0	10
Weight(gms)	$\chi2$ (df=1) = 0.456, p=0.499				
Low birth weight	13	100.0	0	0.0	13
Normal	370	96.6	13	3.4	383
APGAR score at 5 mins	$\chi2$ (df=1) = 6.002, p<**0.05**				
Low	0	0.0	0	0.0	0
Intermediate	3	75.0	1	25.0	4
Normal	380	96.9	12	3.1	392

Preterm: <37 wks, Early term: 37 to 38 weeks, Full term: 39 – 40 weeks, Late term: < 40 weeks; Low birth weight: 1500 to 2499 grams, Normal: ≥ 2500 gms; APGAR score- Low: 0-3, Intermediate: 4-6, Normal:7-10

Independent risk factors associated with hearing loss in WBN babies

A multivariate analysis using logistic regression analysis was carried to identify the factors independently associated with hearing loss in WBN babies. The variables significantly associated with hearing loss in WBN babies were family history of deafness (p = 0.013) and no maternal illness (p= 0.004). The likelihood of having a hearing impairment is 12 times higher in WBN babies with a family history of deafness (OR 12.32, 95% CI 1.7-89.1), whereas the absence of any maternal illness decreases the risk of hearing loss by 86% (OR 0.12, 95% CI 0.036-0.53). Other factors like demographics, ANC factors and risk factors were not the individual contributors for hearing loss in these babies. Table 25 shows the logistic regression analysis of the factors studied.

Table 25: Logistic regression analysis of different factors of WBN babies

	P value	Exp(B)	95% C. I. for EXP(B)	
			Lower	Upper
Age (Days)	0.048	1.412	1.003	1.986
Sex				
Male	0.234	2.109	0.618	7.206
Female				
Family history				
No	0.013	12.317	1.702	89.114
Yes				
Consanguineous marriage				
No	0.452	2.056	0.314	13.461
Yes				
Mode of delivery				
ND	0.946	1.065	0.169	6.725
LSCS				
Maternal illness				
AN				
HT	0.997	-	-	-
No	0.004	0.139	0.036	0.532
Gestational age (weeks)				
Preterm				
Early term	0.588	1.961	0.171	22.504
Full term	0.820	0.713	0.039	13.056
Late term	-	-	-	-

Sensitivity and specificity of the hearing screening test

The Receiver Operating Characteristic (ROC) curve with a probability cut off at 0.5 evaluated the predictive capacity of the test for hearing loss in NICU babies with a sensitivity of 0.692, specificity of 0.688 and AUC of 0.768 (Figure 11 and Table 26). Hence all the above-mentioned factors assessed and analyzed contribute to hearing loss in NICU babies.

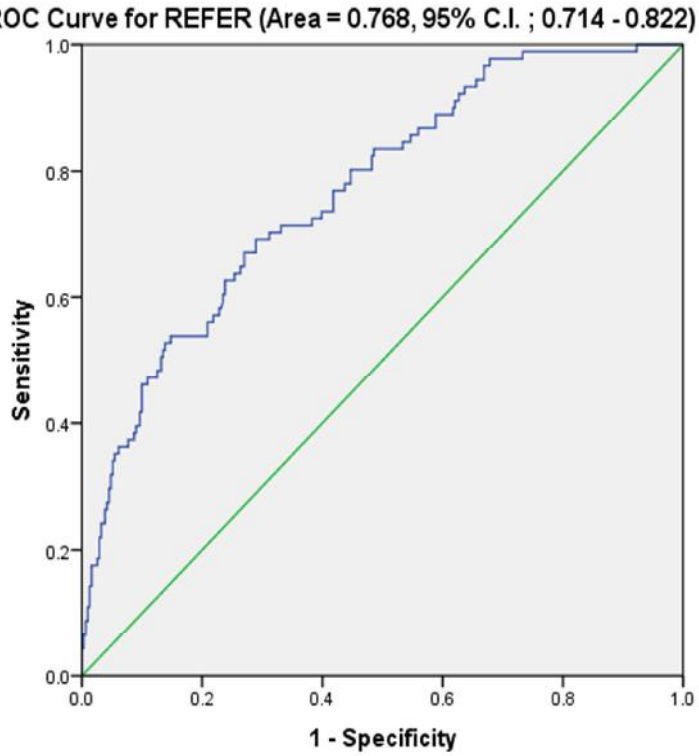


Figure 11: Predictive capacity of the hearing screening test in NICU babies

Table 26: Diagnostic evaluation of hearing screening outcome- NICU babies

Positive if greater than or Equal Toa	Sensitivity	Specificity
0.0544416	0.989	0.077
0.1061879	0.978	0.267
0.1140488	0.967	0.322
0.1158239	0.956	0.331
0.118639	0.934	0.344
0.1228844	0.923	0.363
0.1247489	0.912	0.373
0.1254543	0.901	0.379
0.1269416	0.89	0.383
0.1348562	0.879	0.412
0.1404132	0.857	0.441
0.1421822	0.846	0.453
0.1465188	0.835	0.466
0.1553585	0.824	0.514
0.1558542	0.813	0.518
0.1671921	0.791	0.553
0.169861	0.769	0.563
0.1765023	0.758	0.582
0.1788196	0.725	0.601
0.1817819	0.714	0.617
0.1886973	0.703	0.669
0.1944753	0.692	0.688
0.2014176	0.681	0.711
0.2117665	0.659	0.730
0.216635	0.637	0.736
0.2183032	0.626	0.746

The ROC Curve with a probability cut off at 0.5 evaluated the predictive capacity of the test for hearing loss in WBN babies with a sensitivity of 0.769, specificity of 0.775and AUC of 0.843 (Figure 12 and Table 27). Hence all the above-mentioned factors assessed and analyzed contribute to hearing loss in WBN babies.

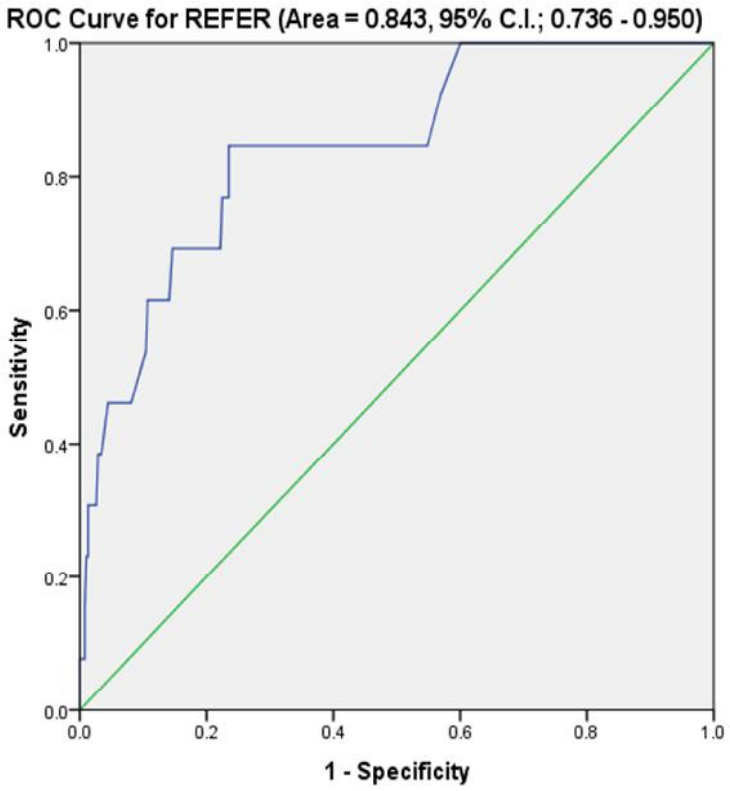


Figure 12: Predictive capacity of the hearing screening test in WBN babies

Table 27: Diagnostic evaluation of for Hearing screening outcomes- WBN babies

Positive if Greater Than or Equal Toa	Sensitivity	Specificity
0.0079137	0.923	0.431
0.0333782	0.846	0.765
0.0354784	0.769	0.775
0.061835	0.692	0.854
0.0888635	0.462	0.93
0.1173174	0.462	0.956
0.1465069	0.385	0.971
0.1937157	0.308	0.987
0.271925	0.231	0.99
0.3265694	0.154	0.992
0.3926458	0.077	0.997

Rehabilitation measures

The main challenge for the otolaryngologist/audiologist remains early rehabilitation of hearing loss. In the last decades, rehabilitation of hearing loss depended on the use of hearing aids that act as sound amplifiers, although their effectiveness is limited by the use of a damaged inner ear. Our NHS program also highlighted the importance of rehabilitation, so necessary rehabilitation was carried out for infants identified with hearing loss. Parents were supplied with detailed informing brochures about the significance and importance of the path of audiological screening and rehabilitation.

Out of 5 babies confirmed to have a hearing loss through BERA, 3 received high-end hearing aid at the age of three years, 1 baby received hearing aid at the age of 4.5years (from Red Cross society) and 1 child was lost to follow up when needed. Therapy remains a major challenge in the management of paediatric SNHL. The babies were followed for 4 years, simultaneously they were given sign language training.

Various educational programs in the form of hearing screening camps, play for the general publics, talks on neonatal screening and paediatric deafness awareness were given on multiple platforms like radio, newspapers etc.

DISCUSSION

Hearing loss is a silent pandemic, almost affecting 466 million people globally, with 70 million children in the age group of 0-15 years. Hearing loss affects nearly all aspects of life especially social, emotional, academic and financial determinants of the person experiencing any degree of hearing loss. The effect of hearing impairment in children has a massive impact on their development. If undiagnosed or lately diagnosed, hearing loss severely affects the child's speech and language skills, resulting in speech impairment, developmental issues, and loss of productive years of the child. Newborn hearing screening programs aim to diagnose the hearing impairment as early as possible to initiate intervention therapies.

Hearing impairment in infants is usually not noticed early and the age of diagnosis is too late. Many children experience a long delay from the time of suspicion of hearing loss to the diagnosis. It has been reported that the median age of diagnosis of mild-moderate hearing loss in children by audiology confirmation was 25 months and intervention usually after 5 months of diagnosis. The diagnosis of severe hearing loss was noticed at a median age of 15 months.[(225)] This leads to the loss of the critical period of speech and language acquisition. The policy of the NHS programs is to screen before 1 month, diagnose before 3 months and start intervention before 6 months of age, drastically reducing the age of diagnosis and intervention. Studies from the USA showed the mean age of hearing loss has decreased to 3-6 months after the implementation of NHS, which used to be 1-2 years before the introduction.[(226)] Canale et al. from Italy observed that the mean age of identification of profound hearing loss was 20.5 months which later reduced to 6.8 months by using screening programs.[(227)] In India, the mean age of suspicion is usually at the age of 1.5

years, mainly by mothers. But, due to the social beliefs and ignorance, it is generally not considered as an important issue, leading to a very late diagnosis at an average of 2.4–3 years of age and rehabilitation between 7.3-9.3 years of age.[228,229] The very late diagnosis affects the timely management of hearing loss in children, emphasizing early identification and intervention.

Our study aimed to screen the babies born in our hospital for hearing loss or deafness through a hospital-based NHS program to validate the recommendation of UNHS, a compulsory procedure in the hospitals. Babies from NICU and WBN were screened to determine the incidence of hearing loss in our study population. The incidence of hearing loss in this cohort of all the infants screened is 6.3 per 1000 newborns screened. Global rates vary between 0.3 to 15 neonates in 1000, with meagre rates in developed countries and higher rates in developing countries.[6] The national average is 4/1000 newborns based on many single centred studies from India. Our study is in agreement with a study from Lucknow where Kumar et al. screened 600 newborns and found 6.7 per 1000 babies had hearing impairment.[92] A Vellore based research also reported that 6 babies per 1000 experienced hearing loss after screening 500 newborns using DPOAE and BERA.[82] Anoh et al. from Côte d'ivoire, a developing African country showed the incidence of permanent hearing loss in their infants as 6 per 1000[230] in line with the incidence of our study. The incidence of newborn hearing loss in our study is higher than in many other Indian studies, with rates as low as 1-2 babies in 1000 screened and the national average. The higher incidence maybe because our tertiary care centre hospital has many high-risk deliveries leading to a larger caseload of at-risk groups.

Hearing loss is more in NICU babies than in well-babies. In our study, the rate of hearing loss was 2.5 per 1000 WBN babies screened whereas, among NICU babies, it was 10 in 1000 babies, a 4 times higher rate than WBN babies. A large-scale study from Turkey projected that 10.3 in 1000 NICU babies had hearing loss, whereas, in well babies, it was 2.8 per 1000, in line with our study.[103] Vignesh et al. screened 422 NICU higher risk and 983 well babies and found four times increase in hearing impairment in NICU neonates.[88] Many researchers have observed the NICU babies are more prone to hearing loss than well babies. It has to be noted that staying in NICU is one of the risk factors according to the JCIH position statements. The primary factors requiring admission in NICU along with the medication or the intervention practiced in NICU are highly associated with hearing loss in infants. It is not surprising that our study showed various risk factors associated with hearing loss like maternal TORCH infection, hyperbilirubinemia etc., mainly in NICU babies and were not noted in WBN babies. The percentage of hearing loss in our NICU babies is 1%. Parab et al. screened 1683 high-risk newborns with two-step screening using TEOAE and ABR and observed 1.1% presented with hearing loss (94). Varying rates have been observed in various settings; 1.7%,[231] 3.1%,[232] 7.8%,[104] 13.7%,[9] depending on the risk factors present in the neonates which promote hearing impairment. Better NICU care might reduce the adverse effect of the risk factors that hugely impact these infants' audiological ability.

The referral rate in preliminary DPOAE screening in our study was 13%, which is relatively higher than the JCIH recommended referral rate of 4%. This high referral rate could be due to the higher false-positive rates noticed in DPOAE screening due to the external auditory canal and middle ear conditions and high ambient noise level.[195] OAE is frequently used in NHS programs as it is simple,

easy, faster and cost-effective. If the NHS includes rescreening with OAE again after few days when these problems had resolved, many will pass the test, which was observed in our study as well where the referral rate dropped to 1.75% after the second OAE screening. We had a very low referral rate in BERA (0.63%), which is the confirmatory screening test. It is well known that BERA has very high sensitivity and specificity compared to thus reducing the overall referral rate. Though BERA incurs a high cost, we were able to identify auditory neuropathy spectrum disorder in one baby, which could be identified only with BERA and usually missed by OAE.[233]

A variety of risk factors are reported to be associated with hearing loss in infants, including a positive history of hearing loss in families, consanguineous marriage, TORCH infection, admission to NICU, mode of delivery, decreased birth weight, increased gestational age, low APGAR score, craniofacial anomalies, neurological condition, hyperbilirubinemia, mechanical ventilation, ototoxic drug use etc. We noted that NICU babies presented more risk factors, especially infection, pre-term birth, low birth weight, low APGAR score, hyperbilirubinemia, the primary reason for the babies to be placed in NICU. Other risk factors such as aminoglycoside usage, mechanical ventilation as a part of medical interventions were present only in NICU babies. These risk factors increase the chances of hearing loss in infants, which was observed in our study, too, as NICU babies experienced more hearing impairment than the WBN babies with no or few risk factors. Risk factors differ from one setting to another, based on the population screened. Thus, it is imperative to investigate the risk factors present in our study group, which will aid in providing better medical care to the infants to minimize hearing loss by successful management of these risk factors.

We found a strong significant association between family history of deafness and hearing loss in neonates. It was noted that this particular risk factor is the only common risk factor in both the NICU and WBN babies and increases the chance of hearing impairment by 12 times in both groups. Family history of childhood hearing loss is an essential stand-alone risk factor, as observed in many studies. A study by James et al. found family history was significantly associated with hearing loss, where 77% of the newborns with this risk factor had failed the hearing screening.[31] Sutton et al. identified family history as one of the four factors contributing to hearing loss and recommends that this risk factor be included in targeted screening as it is highly efficient in detecting the hearing impairment.[112]

Up to 84% of Preterm and term infants are affected by hyperbilirubinemia during the first week of life. Bilirubin induced neurotoxicity leads to the auditory disorder where neonates with extreme hyperbilirubinemia (>10 mg/dl) show a hearing loss. We detected that hyperbilirubinemia increased the risk of hearing loss by 5-fold in NICU babies. It has been demonstrated that SNHL was found to be related to hyperbilirubinemia.[114,117] In a particular work, which analysed the risk factors associated with SNHL in NICU newborns for 15 years, found higher serum bilirubin levels as the primary risk factor.[234] Studies have observed significant changes in audiological evaluation in infants with hyperbilirubinemia. Agrawal et al. noted 57% of the neonates with higher bilirubin levels had abnormal BERA[235] whereas, Gupta et al. found 56% of the babies failed BERA screening.[236]

TORCH infections have severe fetal consequences and are significantly associated with congenital hearing loss. TORCH infections are prevalent in NICU babies than well babies and are considered a risk factor for early or late-onset hearing

loss.[237] Nearly 71% of the NICU babies with hearing loss had TORCH infection and was an independent risk factor for hearing loss, where the odds of developing hearing impairment were 8 folds higher in this group. A study from Greece identified that TORCH infections were related to hearing impairment, especially in NICU babies.[238] Ohl et al., in a six-year screening program in France, by screening 1461 infants observed that TORCH infection was an independent risk factor highly associated with SNHL.[113]

Antenatal period diseases in mothers are a considerable risk factor for hearing loss in neonates. We noted that the absence of any maternal illness like anemia or hypertension decreases the risk of hearing loss by 86% in WBN babies. We also observed that WBN babies born to mothers with anemia had significant hearing loss. Iron deficiency anemia (serum ferritin <10 μg/L), a prevalent condition in Indian women, affects neonatal hearing ability. Anemia can adversely affect the neural development of the fetus, thus disturb the normal auditory maturation resulting in hearing loss. Neonates born to anemic mothers fail the ABR screening in higher rates.[239] ElAlfy et al. investigated the association between maternal anemia and newborn hearing loss and reported that 50% of the neonates failed the hearing screening.[154] Our result indicates that diagnosing and correcting maternal anemia through iron supplements might reduce the risk of hearing loss. A recent study from Pondicherry identified gestational hypertension as a significant risk factor for neonatal hearing loss in a cohort of 200 newborns.[240] Thus, it is essential to improve the quality of the maternal medical care to reduce the risk of hearing impairment.

Consanguineous marriages are prevalent in South-East Asian populations and Middle-East countries. In India, it is widely practiced in the southern states of the

country. Consanguinity is associated with neonatal hearing loss, as observed by Bener et al. in Qatar, where parental consanguinity is the leading cause of hearing loss in their NICU babies[241] and by Selvarajan et al. from Tamil Nadu, who found 40% of the hearing impaired neonates were found to have consanguineous parents.[110] Nevertheless, we did not find any significant association between consanguinity and hearing loss in both NICU and WBN babies.

Likewise, our findings also show no significant association between hearing loss and risk factors like low birth weight, gestational age, mechanical ventilation, Aminoglycoside injection, and craniofacial anomalies etc. which are well-known indicators of hearing loss. Karaca et al. screening 2284 infants and found no association between low birth weight and hearing impairment.[242] In contrast, Barreiri et al. found it to be a significant risk factor along with pre-term birth.[243]

Pre-term infants are at a high risk of hearing impairment. In an extended period of 18 years, the national hearing screening program in Finland screened nearly 10 lakh neonates and reported that prematurity increases the risk of hearing loss in infants.[244] We found 82% were pre-term among the NICU babies, yet only 22% of them had a hearing impairment and could not establish a statistical significance.

Mechanical ventilation is a known risk factor for infant hearing loss. An analysis of 5282 infants found a high frequency of SNHL in the babies subjected to mechanical ventilation, the second leading cause of hearing loss in their setting.[167] On the contrary, no relationship was found between mechanical ventilation and neonatal hearing loss by Pourarian et al. in agreement with our finding.[9]

The use of aminoglycoside is a common practice in NICU babies for treating bacterial infections. Though nearly 47% of our NICU babies were exposed to this

ototoxic drug, we could not find any correlation between the usage of this drug and hearing impairment. Our findings matched with many authors who investigated the extended use of aminoglycosides and failed to establish its relation with increased hearing loss.[166,237]

A strong association between craniofacial anomalies and hearing impairment has been established.[245,246] A large-scale study from Poland involved screening of 11438 infants and reported craniofacial malformations as a significant risk factor for hearing loss.[152] But, only 1.2% of the NICU babies presented with craniofacial anomalies in our study and we could not find any effect of this on neonates hearing inability.

The primary screening was done with OAE and the ROC curve suggested that the test is highly specific and sensitive in hearing screening in both NICU and WBN babies. The results indicate that OAE can be used as a screening tool in a resource-limited setting without compromising the quality of the result.

Rehabilitation is the vital scope of any hearing screening programs. The infants with hearing loss, who have been identified through the NHS were provided with appropriate rehabilitation including audiological intervention with hearing aids. Apart from that, necessary health education to parents was provided to improve the quality of life of the children.

As mentioned earlier, risk factors vary from different settings and understanding the predominant risk factors is of utmost importance to target the infants presented with the particular risk factors prevalent in the specific environment. This study helped us identify the most common risk factors responsible for neonatal hearing loss in our population, which was not studied. This could be used as a basis

for targeted screening in a resource-limited setting. However, a considerable number of babies who have hearing loss without any risk factors will be missed by high risk-targeted screening, justifying the need to implement UNHS programs to benefit the neonates. Moreover, we also observed that some preventable risk factors like TORCH infection, anaemia were significantly associated with hearing loss. Simple measures such as timely vaccination and improved maternal and infant medical care will minimize the preventable cause of hearing loss. Identifying these factors in the population helps us to take suitable preventive measures so that the infant hearing loss rates can be reduced.

Our study showed a high incidence rate of hearing loss in NICU and WBN babies and identified the risk factors contributing to hearing loss in these babies. Our results strongly recommend that UNHS be made a compulsory screening procedure to minimize the deafness associated sequel in the newborn.

CONCLUSION

The results from this study reveal the higher incidence of hearing loss in newborns and validate the critical need for the implementation of UNHS programs to carry out early detection and intervention in infants with hearing impairment. Screening at a younger age, as early as in the prenatal and perinatal period, can help manage hearing impairment. There is ample evidence that if the children are diagnosed and receive any intervention in the earlier stages of life show better speech and language ability. Needless to say, UNHS is the only option to achieve this goal. Though there are constraints to implement NHS in a developing country like India, it is evident from our study that screening programs should be practiced to improve the quality of life of children with hearing loss.

Recommendation:

We strongly recommend UNHS to be widely adopted in our country for the betterment of children with hearing loss

Limitation:

Though our hospital serves a huge population and is a chief referral tertiary care centre in North Karnataka, the study was a single centre study, which might underscore the incidence rate of neonatal hearing loss. A larger study including multiple hospitals would have been more comprehensive. However, our study serves as the first study to assess the incidence rates and risk factors associated with hearing loss in the particular geographical area.

Both JCIH and Indian guidelines recommend the use of AABR for NICU screening. But, due to financial constraints and limited resources, our initial screening

was by DPOAE and only confirmatory screening was by BERA. However, DPOAE showed better sensitivity and specificity which should not be under estimated. A two-stage screening protocol can be considered for NICU babies also in a resource limited setting.

SUMMARY

Infant hearing loss affects a considerable number of infants worldwide. Early hearing detection and intervention is essential to identify infants with hearing loss and rehabilitate them, so the productive years of speech and language development are not lost. In this perspective, the study was undertaken to screen the NICU infants for deafness through the hospital-based NHS program.

The study was conducted by screening 402 babies from NICU and 396 babies from WBN, with DPOAE twice and later with BERA in the babies who failed the initial DPOAE screen. The summary of the study is given below

1.1 Incidence of hearing loss and referral rate in the cohort

- The incidence of hearing loss is 5 out of 798 babies that is 6.3 per 1000 newborns screened
- The referral rate in BERA screening was 0.63% of the total newborns screened

1.2 Hearing loss and Risk factors in NICU babies

Incidence

- 10 in 1000 NICU babies

Demographic factors

- There were 52% male babies and 48% were female
- The rate of consanguineous marriage was 14.9% and 2.5% had a family history of deafness

Antenatal factors

- Maternal illnesses like anaemia, IUGR, hypertension, preeclampsia were noted in 59.5% of the mothers of NICU babies, with 44% of the mothers being anaemic
- Maternal TORCH infection was observed in 1.7% of the mothers
- The rate of assisted delivery and LSCS Caesarean Section were 12.4% and 25.9%, respectively

JCIH risk factors

- Infection was noted in 44.5% of the babies, with 46.8% were treated with aminoglycosides and 10.9% with other medications.
- 37.3% of the NICU babies were on mechanical ventilation
- Craniofacial anomalies were seen in 1.2%
- Neurological factors were observed in 11.9% and 1% had associated syndromes
- A high percentage of 82.1% NICU babies were born preterm, 15.7% were born early term and only 2.2% were full-term babies
- 11.9a%nd 62.2% of the babies in NICU were under very low or low birth weight category respectively
- 54% of babies had low or intermediate APGAR scores
- Hyperbilirubinemia was present in 12.2%

Factors associated with hearing loss in NICU babies

- Univariate analysis of variables showed that family history of deafness, maternal TORCH infection and hyperbilirubinemia were significantly associated with failed hearing tests in NICU babies
- The variables independently associated with hearing loss in NICU babies by multivariate analysis were the same factors - family history of deafness, maternal TORCH infection and hyperbilirubinemia, as identified by univariate analysis.
- The likelihood of hearing impairment is 12 times higher in NICU babies with a family history of deafness, whereas maternal TORCH infection and hyperbilirubinemia increase the odds of hearing loss by 8 folds and 5 folds respectively.

1.3 Hearing loss and Risk factors in WBN babies

Incidence

- 2.5 per 1000 WBN babies.

Demographic factors

- There were 52.5% male babies and 47.5% were female.
- The rate of consanguineous marriage was 5.8% and 2% had a family history of deafness

Antenatal factors

- Maternal illnesses like anaemia and hypertension were noted in 35.6% of the mothers of WBN babies.
- The rate of LSCS Caesarean Section was 36.9% in this group

JCIH risk factors

- A high percentage of WBN babies were born early term (51.5%), 38.9% were full term babies whereas, 7.1% were preterm babies and 2.5% were lateterm
- Only 3.3% of the babies were under the low-birth weight category
- Normal APGAR score was noticed in 99% of the babies
- Other risk factors like infection, treatment with aminoglycosides, mechanical ventilation, craniofacial anomalies, neurological factors and associated syndromes were not observed

Factors associated with hearing loss in WBN babies

- Univariate analysis of variables showed that family history of deafness, anaemia and intermediate APGAR score were significantly associated with failed hearing tests in WBN babies
- The variables independently associated with hearing loss in WBN babies identified by multivariate analysis were family history of deafness and no maternal illness.
- The likelihood of hearing impairment is 12 times higher in WBN babies with a family history of deafness, whereas the absence of any maternal illness decreases the risk of hearing loss by 86%.

1.4 Hearing loss in NICU vs WBN babies

- The incidence of hearing loss was five times higher in NICU babies than WBN babies
- A high number of JCIH risk factors were present only in NICU babies, whereas WBN babies exhibited very few risk factors
- Family history of deafness was a common significant risk factor in both groups.
- Maternal TORCH infection and hyperbilirubinemia were associated with hearing loss in NICU babies. In contrast, anaemia and intermediate APGAR were significantly associated with hearing loss in WBN babies whereas absence of maternal illness reduced the risk of hearing loss in WBN babies.

1.5 Sensitivity and specificity of the hearing screening test

- The ROC Curve with a probability cut off at 0.5 evaluated the predictive capacity of the test for hearing loss in NICU babies showed a sensitivity of 0.692, specificity of 0.688 and AUC of 0.768
- The ROC Curve with a probability cut off at 0.5 evaluated the predictive capacity of the test for hearing loss in WBN babies showed a sensitivity of 0.769, specificity of 0.775and AUC of 0.843

1.6 Rehabilitation measures

- Parents were educated about the significance and importance of audiological screening and rehabilitation using education materials and counselling
- Out of 5 babies with hearing loss through BERA, 4 received high-end hearing aid and one child was lost to follow up.

- Various general measures like frequent hearing screening check-up camps along with awareness talks on the importance of hearing and related aspects were given to the general population

BIBLIOGRAPHY

1. Calderon R, Greenberg M, Marschark M, Spencer P. Social and emotional development of deaf children: Family, school, and program effects. The Oxford handbook of deaf studies, language, and education. 2003;1:188-99.
2. Fellinger J, Holzinger D, Pollard R. Mental health of deaf people. Lancet. 2012;379(9820):1037-44.
3. Organization WH. Addressing the rising prevalence of hearing loss. 2018.
4. Lieu JEC, Kenna M, Anne S, Davidson L. Hearing Loss in Children: A Review. JAMA. 2020;324(21):2195-205.
5. Northern JL, Downs MP. Hearing in children: Lippincott Williams & Wilkins; 2002.
6. Neumann K, Euler HA, Chadha S, White KR. A survey on the global status of newborn and infant hearing screening. Journal of Early Hearing Detection and Intervention. 2020;5(2):63-84.
7. Busse AML, Hoeve HLJ, Nasserinejad K, Mackey AR, Simonsz HJ, Goedegebure A. Prevalence of permanent neonatal hearing impairment: systematic review and Bayesian meta-analysis. Int J Audiol. 2020;59(6): 475-85.
8. Olusanya B, Newton V. Global burden of childhood hearing impairment and disease control priorities for developing countries (vol 369, pg 1314, 2007). Lancet. 2007;369(9576):1860-.
9. Pourarian S, Khademi B, Pishva N, Jamali A. Prevalence of hearing loss in newborns admitted to neonatal intensive care unit. Iran J Otorhinolaryngol. 2012;24(68):129-34.

10. Organization WH. Newborn and infant hearing screening: Current issues and guiding principles for action. 2010.
11. Venkataramanan R. A Dissertation on Hearing Assessment of At-Risk Neonates: Madurai Medical College, Madurai; 2011.
12. Morzaria S, Westerberg BD, Kozak FK. Systematic review of the etiology of bilateral sensorineural hearing loss in children. Int J Pediatr Otorhinolaryngol. 2004;68(9):1193-8.
13. Hearing JCoI. Year 2007 position statement: Principles and guidelines for early hearing detection and intervention programs. Pediatrics. 2007;120(4):898-921.
14. Sininger YS, Doyle KJ, Moore JK. The case for early identification of hearing loss in children: auditory system development, experimental auditory deprivation, and development of speech perception and hearing. Pediatric Clinics of North America. 1999;46(1):1-14.
15. Harrison RV, Gordon KA, Mount RJ. Is there a critical period for cochlear implantation in congenitally deaf children? Analyses of hearing and speech perception performance after implantation. Dev Psychobiol. 2005;46(3): 252-61.
16. Butler I. Identification and management of childhood hearing loss. CME: Your SA Journal of CPD. 2012;30(9):314-7.
17. Sharma A, Dorman MF. Central auditory development in children with cochlear implants: clinical implications. Adv Otorhinolaryngol. 2006;64: 66-88.
18. Jackson I, Hunter L, Moore D, Jones P, Munro K. Facing up to the challenge of behavioural observation in infant hearing assessment. ENT and Audiology News. 2018.

19. Olusanya BO, Luxon LM, Wirz SL. Benefits and challenges of newborn hearing screening for developing countries. Int J Pediatr Otorhinolaryngol. 2004;68(3):287-305.
20. Olusanya BO. Making targeted screening for infant hearing loss an effective option in less developed countries. Int J Pediatr Otorhinolaryngol. 2011;75(3):316-21.
21. Johnson JL, White KR, Widen JE, Gravel JS, James M, Kennalley T, et al. A multicenter evaluation of how many infants with permanent hearing loss pass a two-stage otoacoustic emissions/automated auditory brainstem response newborn hearing screening protocol. Pediatrics. 2005;116(3):663-72.
22. White KR, Vohr BR, Meyer S, Widen JE, Johnson JL, Gravel JS, et al. A multisite study to examine the efficacy of the otoacoustic emission/automated auditory brainstem response newborn hearing screening protocol. 2005.
23. Paludetti G, Conti G, W DIN, E DEC, Rolesi R, Picciotti PM, et al. Infant hearing loss: from diagnosis to therapy Official Report of XXI Conference of Italian Society of Pediatric Otorhinolaryngology. Acta Otorhinolaryngol Ital. 2012;32(6):347-70.
24. Moeller MP. Early intervention and language development in children who are deaf and hard of hearing. Pediatrics. 2000;106(3):E43.
25. Yoshinaga-Itano C, Sedey AL, Mason CA, Wiggin M, Chung W. Early Intervention, Parent Talk, and Pragmatic Language in Children With Hearing Loss. Pediatrics. 2020;146(Suppl 3):S270-S7.
26. Yoshinaga-Itano C, Sedey AL, Wiggin M, Chung W. Early Hearing Detection and Vocabulary of Children With Hearing Loss. Pediatrics. 2017;140(2).

27. Olusanya BO. Screening for neonatal deafness in resource-poor countries: challenges and solutions. Research and Reports in Neonatology. 2015;5:51-64.
28. Organisation NSS. Disabled Persons in India: NSS 58th Round, July-December 2002: National Sample Survey Organisation, Ministry of Statistics and Programme …; 2003.
29. Nagapoornima P, Ramesh A, Srilakshmi, Rao S, Patricia PL, Gore M, et al. Universal hearing screening. Indian J Pediatr. 2007;74(6):545-9.
30. Nishad A, Somayaji KG, Mithun H, Sequeira N. A study of incidence of hearing loss in newborn, designing a protocol and methodology to detect the same in a tertiary health-care center. Indian Journal of Otology. 2020;26(2):85.
31. James M, Kumar P, Ninan P. A study on prevalence and risk factors of hearing impairment among newborns. Int J Contemp Pediatr. 2018;5(2):304-9.
32. Ramkumar V. A REVIEW OF NEONATAL HEARING SCREENING PRACTICES IN INDIA. Journal of Hearing Science. 2017;7(1):9-15.
33. Galhotra A, Sahu P. Challenges and Solutions in Implementing Hearing Screening Program in India. Indian J Community Med. 2019;44(4):299-302.
34. UNICEF. Key data [Available from: https://www.unicef.org/india/key-data.
35. Das S, Seepana R, Bakshi SS. Perspectives of newborn hearing screening in resource constrained settings. J Otol. 2020;15(4):174-7.
36. Alberti PW. The anatomy and physiology of the ear and hearing. Occupational exposure to noise: Evaluation, prevention, and control. 2001:53-62.
37. WHO. Deafness and Hearing loss [Available from: https://www.who.int/news-room/fact-sheets/detail/deafness-and-hearing-loss]
38. Disease GBD, Injury I, Prevalence C. Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195

countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet. 2018;392(10159):1789-858.

39. Organization WH. World report on hearing. 2021.
40. Olusanya BO, Neumann KJ, Saunders JE. The global burden of disabling hearing impairment: a call to action. Bull World Health Organ. 2014;92(5):367-73.
41. Association AS-L-H. Guidelines for manual pure-tone threshold audiometry. 2005.
42. Olusanya BO, Davis AC, Hoffman HJ. Hearing loss grades and the International classification of functioning, disability and health. Bulletin of the World Health Organization. 2019;97(10):725.
43. Welch D, Dawes PJ. Variation in the normal hearing threshold predicts childhood IQ, linguistic, and behavioral outcomes. Pediatric research. 2007;61(6):737-44.
44. Stevens G, Flaxman S, Brunskill E, Mascarenhas M, Mathers CD, Finucane M, et al. Global and regional hearing impairment prevalence: an analysis of 42 studies in 29 countries. Eur J Public Health. 2013;23(1):146-52.
45. Humes LE. The World Health Organization's hearing-impairment grading system: an evaluation for unaided communication in age-related hearing loss. Int J Audiol. 2019;58(1):12-20.
46. Association AS-L-H. Type, degree, and configuration of hearing loss. Audiology Information Series. 2015;10802(2).
47. Alshuaib WB, Al-Kandari JM, Hasan SM. Classification of hearing loss. Update On Hearing Loss: IntechOpen; 2015.

48. Isaacson J, Vora NM. Differential diagnosis and treatment of hearing loss. American family physician. 2003;68(6):1125-32.

49. Zahnert T. The differential diagnosis of hearing loss. Dtsch Arztebl Int. 2011;108(25):433-43; quiz 44.

50. van Beeck Calkoen EA, Engel MSD, van de Kamp JM, Yntema HG, Goverts ST, Mulder MF, et al. The etiological evaluation of sensorineural hearing loss in children. Eur J Pediatr. 2019;178(8):1195-205.

51. Cunningham LL, Tucci DL. Hearing Loss in Adults. N Engl J Med. 2017;377(25):2465-73.

52. Chau JK, Cho JJ, Fritz DK. Evidence-based practice: management of adult sensorineural hearing loss. Otolaryngologic clinics of North America. 2012;45(5):941-58.

53. Katsarkas A, Ayukawa H. Hearing loss due to aging (presbycusis). J Otolaryngol. 1986;15(4):239-44.

54. Swanepoel DW, Laurent C. Classification of hearing loss. Open Access Guide To Audiology And Hearing Aids For Otolaryngologists Available online: http://www entdev uct uct ac za. 2016.

55. Pittman AL, Stelmachowicz PG. Hearing loss in children and adults: audiometric configuration, asymmetry, and progression. Ear Hear. 2003;24(3):198-205.

56. Berninger E, Westling B. Outcome of a universal newborn hearing-screening programme based on multiple transient-evoked otoacoustic emissions and clinical brainstem response audiometry. Acta oto-laryngologica. 2011;131(7):728-39.

57. Kemp DT. Otoacoustic emissions, their origin in cochlear function, and use. British medical bulletin. 2002;63(1):223-41.

58. Baiduc RR, Poling GL, Hong O, Dhar S. Clinical measures of auditory function: the cochlea and beyond. Disease-a-month: DM. 2013;59(4):147.

59. Hall III JW, Smith SD, Popelka GR. Newborn hearing screening with combined otoacoustic emissions and auditory brainstem responses. Journal of the American Academy of Audiology. 2004;15(06):414-25.

60. Suppiej A, Rizzardi E, Zanardo V, Franzoi M, Ermani M, Orzan E. Reliability of hearing screening in high-risk neonates: comparative study of otoacoustic emission, automated and conventional auditory brainstem response. Clinical Neurophysiology. 2007;118(4):869-76.

61. Olusanya BO, Somefun AO, Swanepoel DW. The need for standardization of methods for worldwide infant hearing screening: a systematic review. The Laryngoscope. 2008;118(10):1830-6.

62. Choo D, Meinzen-Derr J. Newborn hearing screening in 2010. Current opinion in otolaryngology & head and neck surgery. 2010;18(5):399.

63. WHO. Deafness estimates [Available from: http://www.who.int/pbd/deafness/estimates]

64. Grindle CR. Pediatric hearing loss. Pediatr Rev. 2014;35(11):456-63; quiz 64.

65. Watkin P, Baldwin M. The longitudinal follow up of a universal neonatal hearing screen: the implications for confirming deafness in childhood. Int J Audiol. 2012;51(7):519-28.

66. Antoni M, Rouillon I, Denoyelle F, Garabedian EN, Loundon N. Newborn hearing screening: Prevalence and medical and paramedical treatment of

bilateral hearing loss in a neonatal series in the Ile-de-France region of France. Eur Ann Otorhinolaryngol Head Neck Dis. 2016;133(2):95-9.

67. De Capua B, Costantini D, Martufi C, Latini G, Gentile M, De Felice C. Universal neonatal hearing screening: the Siena (Italy) experience on 19,700 newborns. Early Hum Dev. 2007;83(9):601-6.
68. Cao-Nguyen MH, Kos MI, Guyot JP. Benefits and costs of universal hearing screening programme. Int J Pediatr Otorhinolaryngol. 2007;71(10):1591-5.
69. Bailey HD, Bower C, Krishnaswamy J, Coates HL. Newborn hearing screening in Western Australia. Med J Aust. 2002;177(4):180-5.
70. Gonzalez de Aledo Linos A, Bonilla Miera C, Morales Angulo C, Gomez Da Casa F, Barrasa Benito J. [Universal newborn hearing screening in Cantabria (Spain): results of the first two years]. An Pediatr (Barc). 2005;62(2):135-40.
71. Van Kerschaver E, Boudewyns AN, Declau F, Van de Heyning PH, Wuyts FL. Socio-demographic determinants of hearing impairment studied in 103,835 term babies. Eur J Public Health. 2013;23(1):55-60.
72. van der Ploeg CP, Uilenburg NN, Kauffman-de Boer MA, Oudesluys-Murphy AM, Verkerk PH. Newborn hearing screening in youth health care in the Netherlands: National results of implementation and follow-up. Int J Audiol. 2012;51(8):584-90.
73. Chapchap MJ, Segre CM. Universal newborn hearing screening and transient evoked otoacoustic emission: new concepts in Brazil. Scand Audiol Suppl. 2001(53):33-6.
74. Oliveira JS, Rodrigues LB, Aurelio FS, Silva VB. Risk factors and prevalence of newborn hearing loss in a private health care system of Porto Velho, Northern Brazil. Rev Paul Pediatr. 2013;31(3):299-305.

75. Yuan X, Deng K, Zhu J, Xiang L, Yao Y, Li Q, et al. Newborn hearing screening coverage and detection rates of hearing impairment across China from 2008-2016. BMC Pediatr. 2020;20(1):360.

76. Abdullah A, Hazim MY, Almyzan A, Jamilah AG, Roslin S, Ann MT, et al. Newborn hearing screening: experience in a Malaysian hospital. Singapore Med J. 2006;47(1):60-4.

77. Korver AM, Smith RJ, Van Camp G, Schleiss MR, Bitner-Glindzicz MA, Lustig LR, et al. Congenital hearing loss. Nat Rev Dis Primers. 2017;3:16094.

78. Ahmed S, Sheraz S, Malik SA, Ahmed NR, Malik SA, Farooq S, et al. Frequency Of Congenital Hearing Loss In Neonates. J Ayub Med Coll Abbottabad. 2018;30(2):234-6.

79. Bashiruddin J. Newborn Hearing Screening in Six Hospitals in Jakarta and Surroundings. Journal of the Indonesian Medical Association. 2009.

80. Shrestha B, Karmacharya S, Dhakal A, KC A, Shrestha K, Pradhan A, et al. Universal Neonatal Hearing Screening: An Experience at Tertiary Care Hospital. Kathmandu University Medical Journal. 2020;18(2):57-61.

81. Olusanya BO. Highlights of the new WHO Report on Newborn and Infant Hearing Screening and implications for developing countries. Int J Pediatr Otorhinolaryngol. 2011;75(6):745-8.

82. John M, Balraj A, Kurien M. Neonatal screening for hearing loss: pilot study from a tertiary care centre. Indian Journal of Otolaryngology and Head & Neck Surgery. 2009;61(1):23-6.

83. Vaid N, Shanbhag J, Nikam R, Biswas A. Neonatal hearing screening–The Indian experience. Cochlear implants international. 2009;10(S1):111-4.

84. Paul AK. Early identification of hearing loss and centralized newborn hearing screening facility-the Cochin experience. Indian pediatrics. 2011;48(5):355-9.

85. Rai N, Thakur N. Universal screening of newborns to detect hearing impairment--is it necessary? Int J Pediatr Otorhinolaryngol. 2013;77(6): 1036-41.

86. Augustine AM, Jana AK, Kuruvilla KA, Danda S, Lepcha A, Ebenezer J, et al. Neonatal hearing screening--experience from a tertiary care hospital in southern India. Indian Pediatr. 2014;51(3):179-83.

87. Gouri ZUH, Sharma D, Berwal PK, Pandita A, Pawar S. Hearing impairment and its risk factors by newborn screening in north-western India. Maternal health, neonatology and perinatology. 2015;1(1):1-8.

88. Vignesh SS, Jaya V, Sasireka BI, Sarathy K, Vanthana M. Prevalence and referral rates in neonatal hearing screening program using two step hearing screening protocol in Chennai - A prospective study. Int J Pediatr Otorhinolaryngol. 2015;79(10):1745-7.

89. Sharma Y, Mishra G, Bhatt SH, Nimbalkar S. Neonatal Hearing Screening Programme (NHSP): At a rural based tertiary care centre. Indian Journal of Otolaryngology and Head & Neck Surgery. 2015;67(4):388-93.

90. Paul AK. Centralized newborn hearing screening in Ernakulam, Kerala–experience over a decade. Indian pediatrics. 2016;53(1):15-7.

91. Kumar R, Kini P, Sardangouda P. Routine newborn hearing screening–an Indian experience. Int J Pregn & Chi Birth. 2016;1(1):15-7.

92. Kumar A, Gupta SC, Sinha VR. Universal Hearing Screening in Newborns Using Otoacoustic Emissions and Brainstem Evoked Response in Eastern Uttar Pradesh. Indian J Otolaryngol Head Neck Surg. 2017;69(3):296-9.

93. Singh PK, Kumar N, Kumar D, Shrivastava N, Kumar A. A prospective study for hearing screening of 4356 newborns by transient evoked oto-acoustic emissions and brainstem evoked response audiometry: a study of high risk factors for hearing loss. Int J Res Med Sci. 2017;5(4):1554-7.

94. Parab SR, Khan MM, Kulkarni S, Ghaisas V, Kulkarni P. Neonatal Screening for Prevalence of Hearing Impairment in Rural Areas. Indian J Otolaryngol Head Neck Surg. 2018;70(3):380-6.

95. Kaipuzha RR, Pulimoottil DT, Karthikeyan P. Universal neonatal hearing screening in a tertiary care center in South India. Saudi Journal of Otorhinolaryngology Head and Neck Surgery. 2019;21(2):29.

96. Jacob J, Kurien M, Kumar P, Krishnan L. Challenges of Universal Newborn Hearing Screening in a Developing Country-a Double-Edged Sword. Indian Journal of Otolaryngology and Head & Neck Surgery. 2020:1-7.

97. Vohr BR, Widen JE, Cone-Wesson B, Sininger YS, Gorga MP, Folsom RC, et al. Identification of neonatal hearing impairment: characteristics of infants in the neonatal intensive care unit and well-baby nursery. Ear Hear. 2000;21(5): 373-82.

98. Butcher E, Dezateux C, Cortina-Borja M, Knowles RL. Prevalence of permanent childhood hearing loss detected at the universal newborn hearing screen: Systematic review and meta-analysis. PLoS One. 2019;14(7):e0219600.

99. Butcher E, Dezateux C, Knowles RL. Risk factors for permanent childhood hearing impairment. Archives of disease in childhood. 2020;105(2):187-9.

100. Chang J, Oh SH, Park SK. Comparison of newborn hearing screening results between well babies and neonates admitted to the neonatal intensive care unit

for more than 5 days: Analysis based on the national database in Korea for 9 years. PLoS One. 2020;15(6):e0235019.

101. O'Connor A, O'Sullivan PG, Behan L, Norman G, Murphy B. Initial results from the newborn hearing screening programme in Ireland. Ir J Med Sci. 2013;182(4):551-6.
102. Korres S, Nikolopoulos TP, Komkotou V, Balatsouras D, Kandiloros D, Constantinou D, et al. Newborn hearing screening: effectiveness, importance of high-risk factors, and characteristics of infants in the neonatal intensive care unit and well-baby nursery. Otol Neurotol. 2005;26(6):1186-90.
103. Tasci Y, Muderris, II, Erkaya S, Altinbas S, Yucel H, Haberal A. Newborn hearing screening programme outcomes in a research hospital from Turkey. Child Care Health Dev. 2010;36(3):317-22.
104. Stadio AD, Molini E, Gambacorta V, Giommetti G, Volpe AD, Ralli M, et al. Sensorineural Hearing Loss in Newborns Hospitalized in Neonatal Intensive Care Unit: An Observational Study. Int Tinnitus J. 2019;23(1):31-6.
105. Lima GM, Marba ST, Santos MF. Hearing screening in a neonatal intensive care unit. J Pediatr (Rio J). 2006;82(2):110-4.
106. Sachdeva K, Sao T. Outcomes of Newborn Hearing Screening Program: A Hospital Based Study. Indian J Otolaryngol Head Neck Surg. 2017;69 (2):194-8.
107. Kochhar A, Hildebrand MS, Smith RJ. Clinical aspects of hereditary hearing loss. Genet Med. 2007;9(7):393-408.
108. JCIH. Position Statements [Available from: http://www.jcih.org/ posstatemts. htm.]

109. CDC. Hearing loss- Genetics [Available from: https://www.cdc.gov/ncbddd/hearingloss/genetics.html.]

110. Selvarajan HG, Arunachalam RK, Bellur R, Mandke K, Nagarajan R. Association of family history and consanguinity with permanent hearing impairment. Indian Journal of Otology. 2013;19(2):62.

111. Driscoll C, Beswick R, Doherty E, D'Silva R, Cross A. The validity of family history as a risk factor in pediatric hearing loss. Int J Pediatr Otorhinolaryngol. 2015;79(5):654-9.

112. Sutton GJ, Rowe SJ. Risk factors for childhood sensorineural hearing loss in the Oxford region. Br J Audiol. 1997;31(1):39-54.

113. Ohl C, Dornier L, Czajka C, Chobaut JC, Tavernier L. Newborn hearing screening on infants at risk. Int J Pediatr Otorhinolaryngol. 2009;73(12): 1691-5.

114. Teixeira MH, Borges VMS, Riesgo RDS, Sleifer P. Hyperbilirubinemia impact on newborn hearing: a literature review. Rev Assoc Med Bras (1992). 2020;66(7):1002-8.

115. Okhravi T, Eslami ST, Ahmadi AH, Nassirian H, Najibpour R. Evaluation of auditory brain stems evoked response in newborns with pathologic hyperbilirubinemia in Mashhad, Iran. Iranian Red Crescent Medical Journal. 2015;17(2).

116. Panahi R, Jafari Z, Sheibanizade A, Salehi M, Esteghamati A, Hasani S. The Relationship between the behavioral hearing thresholds and maximum bilirubin levels at birth in children with a history of neonatal hyperbilirubinemia. Iranian journal of otorhinolaryngology. 2013;25(72):127.

117. Boskabadi H, Zakerihamidi M, Moradi A, Bakhshaee M. Risk Factors for Sensorineural Hearing Loss in Neonatal Hyperbilirubinemia. Iran J Otorhinolaryngol. 2018;30(99):195-202.

118. Huth ME, Ricci AJ, Cheng AG. Mechanisms of aminoglycoside ototoxicity and targets of hair cell protection. Int J Otolaryngol. 2011;2011:937861.

119. Selimoglu E. Aminoglycoside-induced ototoxicity. Curr Pharm Des. 2007;13(1):119-26.

120. Johnson RF, Cohen AP, Guo Y, Schibler K, Greinwald JH. Genetic mutations and aminoglycoside-induced ototoxicity in neonates. Otolaryngol Head Neck Surg. 2010;142(5):704-7.

121. Alvarez FJ, Revuelta M, Santaolalla F, Alvarez A, Lafuente H, Arteaga O, et al. Effect of neonatal asphyxia on the impairment of the auditory pathway by recording auditory brainstem responses in newborn piglets: a new experimentation model to study the perinatal hypoxic-ischemic damage on the auditory system. PLoS One. 2015;10(5):e0126885.

122. Rastogi S, Mikhael M, Filipov P, Rastogi D. Effects of ventilation on hearing loss in preterm neonates: Nasal continuous positive pressure does not increase the risk of hearing loss in ventilated neonates. Int J Pediatr Otorhinolaryngol. 2013;77(3):402-6.

123. Galambos R, Despland PA. The auditory brainstem response (ABR) evaluates risk factors for hearing loss in the newborn. Pediatr Res. 1980;14(2):159-63.

124. Mann T, Adams K. Sensorineural hearing loss in ECMO survivors. Extracorporeal membraneous oxygenation. J Am Acad Audiol. 1998;9(5): 367-70.

125. Fligor BJ, Neault MW, Mullen CH, Feldman HA, Jones DT. Factors associated with sensorineural hearing loss among survivors of extracorporeal membrane oxygenation therapy. Pediatrics. 2005;115(6):1519-28.

126. Lasky RE, Wiorek L, Becker TR. Hearing loss in survivors of neonatal extracorporeal membrane oxygenation (ECMO) therapy and high-frequency oscillatory (HFO) therapy. J Am Acad Audiol. 1998;9(1):47-58.

127. Robertson CM. Hearing loss among children who have undergone ECMO. CMAJ. 1995;153(7):881.

128. Del Pizzo J. Focus on diagnosis: congenital infections (TORCH). Pediatr Rev. 2011;32(12):537-42.

129. Shet A. Congenital and perinatal infections: throwing new light with an old TORCH. Indian J Pediatr. 2011;78(1):88-95.

130. Ross DS, Fowler KB. Cytomegalovirus: A major cause of hearing loss in children. The ASHA leader. 2008;13(6):14-7.

131. Fowler KB, McCollister FP, Dahle AJ, Boppana S, Britt WJ, Pass RF. Progressive and fluctuating sensorineural hearing loss in children with asymptomatic congenital cytomegalovirus infection. J Pediatr. 1997;130(4):624-30.

132. Bale JF, Jr. Cytomegalovirus infections. Semin Pediatr Neurol. 2012;19 (3):101-6.

133. Schraff SA, Schleiss MR, Brown DK, Meinzen-Derr J, Choi KY, Greinwald JH, et al. Macrophage inflammatory proteins in cytomegalovirus-related inner ear injury. Otolaryngol Head Neck Surg. 2007;137(4):612-8.

134. Barbi M, Binda S, Caroppo S, Primache V. Neonatal screening for congenital cytomegalovirus infection and hearing loss. J Clin Virol. 2006;35(2):206-9.

135. Cohen BE, Durstenfeld A, Roehm PC. Viral causes of hearing loss: a review for hearing health professionals. Trends Hear. 2014;18.

136. Lee JY, Bowden DS. Rubella virus replication and links to teratogenicity. Clin Microbiol Rev. 2000;13(4):571-87.

137. Hayes D. Hearing loss in infants with craniofacial anomalies. Otolaryngol Head Neck Surg. 1994;110(1):39-45.

138. Chu K, Elimian A, Barbera J, Ogburn P, Spitzer A, Quirk JG. Antecedents of newborn hearing loss. Obstetrics & Gynecology. 2003;101(3):584-8.

139. da Silva DPC, Ribeiro GE, Montovani JC. Influência do Apgar baixo na primeira triagem auditiva do neonato. ABCS Health Sciences. 2019;44(2).

140. Fetus Co, Newborn A, Practice CoO, Pediatrics AAo. ACOG Committee Opinion. Number 333, May 2006 (replaces No. 174, July 1996): The Apgar score. Obstetrics and gynecology. 2006;107(5):1209-12.

141. Blanc AK, Wardlaw T. Monitoring low birth weight: an evaluation of international estimates and an updated estimation procedure. Bulletin of the World Health Organization. 2005;83:178-85d.

142. Cristobal R, Oghalai JS. Hearing loss in children with very low birth weight: current review of epidemiology and pathophysiology. Arch Dis Child Fetal Neonatal Ed. 2008;93(6):F462-8.

143. Smolkin T, Mick O, Dabbah M, Blazer S, Grakovsky G, Gabay N, et al. Birth by cesarean delivery and failure on first otoacoustic emissions hearing test. Pediatrics. 2012;130(1):e95-100.

144. Xiao T, Li Y, Xiao L, Jiang L, Hu Q. Association between mode of delivery and failure of neonatal acoustic emission test: a retrospective analysis. Int J Pediatr Otorhinolaryngol. 2015;79(4):516-9.

145. Abu-Shaheen A, Al-Masri M, El-Bakri N, Batieha A, Nofal A, Abdelmoety D. Prevalence and risk factors of hearing loss among infants in Jordan: initial results from universal neonatal screening. International journal of audiology. 2014;53(12):915-20.

146. Lotfi Y, Mehrkian S. Hearing impairments in consanguineous marriage. Iranian Rehabilitation Journal. 2004;2(1):9-14.

147. Zakzouk S. Consanguinity and hearing impairment in developing countries: a custom to be discouraged. J Laryngol Otol. 2002;116(10):811-6.

148. Reddy M, Bindu LH, Reddy P, Rani PU. Role of consanguinity in congenital neurosensory deafness. International Journal of Human Genetics. 2006;6(4):357-8.

149. Verma IC. Burden of genetic disorders in India. Indian J Pediatr. 2000;67(12):893-8.

150. Almazroua AM, Alsughayer L, Ababtain R, Al-Shawi Y, Hagr AA. The association between consanguineous marriage and offspring with congenital hearing loss. Ann Saudi Med. 2020;40(6):456-61.

151. Obstetricians ACo, Gynecologists. ACOG Committee Opinion No 579: definition of term pregnancy. Obstet Gynecol. 2013;122(5):1139-40.

152. Wroblewska-Seniuk K, Greczka G, Dabrowski P, Szyfter-Harris J, Mazela J. Hearing impairment in premature newborns-Analysis based on the national hearing screening database in Poland. PLoS One. 2017;12(9):e0184359.

153. Marlow ES, Hunt LP, Marlow N. Sensorineural hearing loss and prematurity. Arch Dis Child Fetal Neonatal Ed. 2000;82(2):F141-4.

154. ElAlfy MS, El-Farrash RA, Taha HM, Ismail EA, Mokhtar NA. Auditory brainstem response in full-term neonates born to mothers with iron deficiency

anemia: relation to disease severity. J Matern Fetal Neonatal Med. 2020;33(11):1881-8.

155. Ramel SE, Georgieff MK. Preterm nutrition and the brain. Nutritional Care of Preterm Infants. 2014;110:190-200.
156. Kassebaum N, Kyu HH, Zoeckler L, Olsen HE, Thomas K, Pinho C, et al. Child and adolescent health from 1990 to 2015: findings from the global burden of diseases, injuries, and risk factors 2015 study. JAMA pediatrics. 2017;171(6):573-92.
157. Radlowski EC, Johnson RW. Perinatal iron deficiency and neurocognitive development. Frontiers in human neuroscience. 2013;7:585.
158. Georgieff MK. Iron assessment to protect the developing brain. The American journal of clinical nutrition. 2017;106(suppl_6):1588S-93S.
159. Tabrizi AG, Asadi M, Naini AS. Preeclamsia: A New Risk Factor for Hearing Loss. Biomedical and Pharmacology Journal. 2016;9(3):1135-8.
160. Baylan MY, Kuyumcuoglu U, Kale A, Celik Y, Topcu I. Is preeclampsia a new risk factor for cochlear damage and hearing loss? Otology & Neurotology. 2010;31(8):1180-3.
161. Angrisani RG, Fagá AMC, Goulart AL, Azevedo MFd. Intracranial hemorrhage and central auditory disorders in neonates. Revista CEFAC. 2016;18(2):341-7.
162. da Silva LS, Ribeiro GE, Montovani JC, Silva D. The effect of peri-intraventricular hemorrhage on the auditory pathway of infants. Int J Pediatr Otorhinolaryngol. 2018;112:24-6.
163. Morton CC, Nance WE. Newborn hearing screening--a silent revolution. N Engl J Med. 2006;354(20):2151-64.

164. Organization WH. Childhood Hearing Loss: Strategies for prevention and care. 2016.

165. Ramakrishnan U, Imhoff-Kunsch B, Martorell R. Maternal nutrition interventions to improve maternal, newborn, and child health outcomes. Nestle Nutr Inst Workshop Ser. 2014;78:71-80.

166. Garinis AC, Kemph A, Tharpe AM, Weitkamp JH, McEvoy C, Steyger PS. Monitoring neonates for ototoxicity. Int J Audiol. 2018;57(sup4):S41-S8.

167. Bielecki I, Horbulewicz A, Wolan T. Risk factors associated with hearing loss in infants: an analysis of 5282 referred neonates. Int J Pediatr Otorhinolaryngol. 2011;75(7):925-30.

168. Friedmann N, Rusou D. Critical period for first language: the crucial role of language input during the first year of life. Curr Opin Neurobiol. 2015;35: 27-34.

169. Friedmann N, Szterman R. Syntactic movement in orally trained children with hearing impairment. J Deaf Stud Deaf Educ. 2006;11(1):56-75.

170. Reyes R. Early intervention for hearing impairment: appropriate, accessible and affordable. Ann Acad Med Singap. 2008;37(12 Suppl):55-2.

171. Yoshinaga-Itano C. The social-emotional ramifications of universal newborn hearing screening, early identification and intervention of children who are deaf or hard of hearing. A sound foundation through early amplification. 2001 :221-31.

172. Yoshinaga-Itano C. Early intervention after universal neonatal hearing screening: impact on outcomes. Ment Retard Dev Disabil Res Rev. 2003;9(4):252-66.

173. Bruijnzeel H, Ziylan F, Stegeman I, Topsakal V, Grolman W. A Systematic Review to Define the Speech and Language Benefit of Early (<12 Months) Pediatric Cochlear Implantation. Audiol Neurootol. 2016;21(2):113-26.

174. May-Mederake B. Early intervention and assessment of speech and language development in young children with cochlear implants. Int J Pediatr Otorhinolaryngol. 2012;76(7):939-46.

175. Desloovere C, Verhaert N, Van Kerschaver E, Debruyne F. Fifteen years of early hearing screening in Flanders: impact on language and education. B-ENT. 2013;21:81-90.

176. Downs MP, Sterritt GM. A guide to newborn and infant hearing screening programs. Arch Otolaryngol. 1967;85(1):15-22.

177. Narrigan D. Newborn hearing screening update for midwifery practice. J Midwifery Womens Health. 2000;45(5):368-77.

178. Harrison M, Roush J, Wallace J. Trends in age of identification and intervention in infants with hearing loss. Ear Hear. 2003;24(1):89-95.

179. CDC. 2018 Summary of National CDC EHDI data [Available from: https://www.cdc.gov/ncbddd/hearingloss/2018-data/01-data-summary.html.]

180. Abdul Hadi K, Salahaldin A, Al Qahtani A, Al Musleh Z, Al Sulaitin M, Bener A, et al. Universal neonatal hearing screening: Six years of experience in Qatar. Qatar Med J. 2012;2012(2):42-50.

181. Wood SA, Sutton GJ, Davis AC. Performance and characteristics of the Newborn Hearing Screening Programme in England: The first seven years. Int J Audiol. 2015;54(6):353-8.

182. RamkumarAEF V. A review of neonatal hearing screening practices in India. Journal of Hearing Science. 2017;7(2).

183. ANI. NPPCD will target over 6 pc of India's population with disabling hearing loss, says Harsh Vardhan

[Available from: https://www.aninews.in/news/national/general-news/nppcd-will-target-over-6-pc-of-indias-population-with-disabling-hearing-loss-says-harsh-vardhan20210303224658/.]

184. Ministry of Health and Family Welfare GoI. Rashtriya Bal Swasthya Karyakram (RBSK)- Child Health screening and Early Intervention Services under NRHM 2013 [Available from: http://cghealth.nic.in/nhmcg/Informations/RMNCH/7Rastriya_Bal_Swaasthya_karyakaram.pdf.]

185. Ramesh A, Jagdish C, Nagapoorinima M, Suman Rao PN, Ramakrishnan AG, Thomas GC, et al. Low cost calibrated mechanical noisemaker for hearing screening of neonates in resource constrained settings. Indian J Med Res. 2012;135:170-6.

186. Ramkumar V, Nagarajan R, Shankarnarayan VC, Kumaravelu S, Hall JW. Implementation and evaluation of a rural community-based pediatric hearing screening program integrating in-person and tele-diagnostic auditory brainstem response (ABR). BMC Health Serv Res. 2019;19(1):1.

187. Stein L, Clark S, Kraus N. The hearing-impaired infant: patterns of identification and habilitation. Ear Hear. 1983;4(5):232-6.

188. Mauk GW, White KR, Mortensen LB, Behrens TR. The effectiveness of screening programs based on high-risk characteristics in early identification of hearing impairment. Ear Hear. 1991;12(5):312-9.

189. Huang LH, Zhang L, Tobe RY, Qi FH, Sun L, Teng Y, et al. Cost-effectiveness analysis of neonatal hearing screening program in China: should universal screening be prioritized? BMC Health Serv Res. 2012;12:97.

190. Imam SS, El-Farrash RA, Taha HM, Bishoy HE. Targeted versus Universal Neonatal Hearing Screening in a Single Egyptian Center. ISRN Pediatr. 2013;2013:574937.

191. Joint Committee on Infant H, American Academy of A, American Academy of P, American Speech-Language-Hearing A, Directors of S, Hearing Programs in State H, et al. Year 2000 position statement: principles and guidelines for early hearing detection and intervention programs. Joint Committee on Infant Hearing, American Academy of Audiology, American Academy of Pediatrics, American Speech-Language-Hearing Association, and Directors of Speech and Hearing Programs in State Health and Welfare Agencies. Pediatrics. 2000;106(4):798-817.

192. Davis A, Bamford J, Wilson I, Ramkalawan T, Forshaw M, Wright S. A critical review of the role of neonatal hearing screening in the detection of congenital hearing impairment. Health Technol Assess. 1997;1(10):i-iv, 1-176.

193. Kemp DT. Otoacoustic emissions, their origin in cochlear function, and use. Br Med Bull. 2002;63:223-41.

194. Sokol J, Hyde M. Hearing screening. Pediatr Rev. 2002;23(5):155-62.

195. Wroblewska-Seniuk KE, Dabrowski P, Szyfter W, Mazela J. Universal newborn hearing screening: methods and results, obstacles, and benefits. Pediatric research. 2017;81(3):415-22.

196. Patel H, Feldman M. Universal newborn hearing screening. Paediatr Child Health. 2011;16(5):301-10.

197. Kuki S, Chadha S, Dhingra S, Gulati A. The role of current audiological tests in the early diagnosis of hearing impairment in infant. Indian J Otolaryngol Head Neck Surg. 2013;65(3):244-50.

198. Prescriber A. Newborn hearing screening. Australian Prescriber. 2003;26(4).

199. van Straaten HL. Automated auditory brainstem response in neonatal hearing screening. Acta Paediatr Suppl. 1999;88(432):76-9.

200. Sena-Yoshinaga TA, Almeida MG, Côrtes-Andrade IF, Lewis DR. Neonatal hearing screening with automated auditory brainstem response: using different technologies. Audiology-Communication Research. 2014;19(1):19-24.

201. Kamenov K, Chadha S. Methodological quality of clinical guidelines for universal newborn hearing screening. Dev Med Child Neurol. 2021;63 (1):16-21.

202. From National Consultation Meeting for Developing IAPGoNDutaoIAPCDG, the Committee on Child D, Neurodevelopmental D, Paul A, Prasad C, Kamath SS, et al. Consensus Statement of the Indian Academy of Pediatrics on Newborn Hearing Screening. Indian Pediatr. 2017;54(8):647-51.

203. Gouri ZU, Sharma D, Berwal PK, Pandita A, Pawar S. Hearing impairment and its risk factors by newborn screening in north-western India. Matern Health Neonatol Perinatol. 2015;1:17.

204. Kanne TJ, Schaefer L, Perkins JA. Potential pitfalls of initiating a newborn hearing screening program. Arch Otolaryngol Head Neck Surg. 1999;125(1): 28-32.

205. Ravi R, Gunjawate DR, Yerraguntla K, Rajashekhar B. Systematic review of knowledge of, attitudes towards, and practices for newborn hearing screening

among healthcare professionals. Int J Pediatr Otorhinolaryngol. 2018;104: 138-44.

206. Sharma Y, Bhatt SH, Nimbalkar S, Mishra G. Non-compliance with neonatal hearing screening follow-up in rural western India. Indian pediatrics. 2018;55(6):482-4.
207. Merugumala SV, Pothula V, Cooper M. Barriers to timely diagnosis and treatment for children with hearing impairment in a southern Indian city: a qualitative study of parents and clinic staff. Int J Audiol. 2017;56(10):733-9.
208. Cockfield CM, Garner GD, Borders JC. Follow-up after a failed newborn hearing screen: a quality improvement study. ORL Head Neck Nurs. 2012;30(3):9-13.
209. Núnez-Batalla F, Trinidad-Ramos G, Sequí-Canet JM, De Aguilar VA, Jáudenes-Casaubón C. Risk factors for sensorineural hearing loss in children. Acta Otorrinolaringologica (English Edition). 2012;63(5):382-90.
210. Dillon H. Hearing aids: Hodder Arnold; 2008.
211. Hoppe U, Hesse G. Hearing aids: indications, technology, adaptation, and quality control. GMS Curr Top Otorhinolaryngol Head Neck Surg. 2017;16:Doc08.
212. Marie A, Gonzalez-Gonzalez S. Biological mechanism of cochlear implant technology in humans. J Neurosci Clin Res 3. 2018;2:2.
213. Fitzpatrick EM, Ham J, Whittingham J. Pediatric Cochlear Implantation: Why Do Children Receive Implants Late? Ear Hear. 2015;36(6):688-94.
214. Dutra MRP, Ferreira MAF. Provision of the frequency modulation system for the hearing impaired. Braz J Otorhinolaryngol. 2020.

215. Ville Y, Leruez-Ville M. Managing infections in pregnancy. Curr Opin Infect Dis. 2014;27(3):251-7.

216. Kimberlin DW, Lin CY, Sanchez PJ, Demmler GJ, Dankner W, Shelton M, et al. Effect of ganciclovir therapy on hearing in symptomatic congenital cytomegalovirus disease involving the central nervous system: a randomized, controlled trial. J Pediatr. 2003;143(1):16-25.

217. Shin JJ, Keamy DG, Jr., Steinberg EA. Medical and surgical interventions for hearing loss associated with congenital cytomegalovirus: a systematic review. Otolaryngol Head Neck Surg. 2011;144(5):662-75.

218. Rosenfeld RM, Schwartz SR, Pynnonen MA, Tunkel DE, Hussey HM, Fichera JS, et al. Clinical practice guideline: Tympanostomy tubes in children. Otolaryngol Head Neck Surg. 2013;149(1 Suppl):S1-35.

219. Schwager K. Reconstruction of middle ear malformations. GMS Curr Top Otorhinolaryngol Head Neck Surg. 2007;6:Doc01.

220. Sennaroglu L, Bajin MD. Classification and Current Management of Inner Ear Malformations. Balkan Med J. 2017;34(5):397-411.

221. Fitzpatrick EM, Stevens A, Garritty C, Moher D. The effects of sign language on spoken language acquisition in children with hearing loss: a systematic review protocol. Syst Rev. 2013;2:108.

222. Bergeron F, Berland A, Demers D, Gobeil S. Contemporary Speech and Oral Language Care for Deaf and Hard-of-Hearing Children Using Hearing Devices. J Clin Med. 2020;9(2).

223. Watson SM, Henggeler SW, Whelan JP. Family functioning and the social adaptation of hearing-impaired youths. J Abnorm Child Psychol. 1990;18(2):143-63.

224. Spencer PE, Marschark M, Spencer LJ. Cochlear implants: Advances, issues, and implications. 2011.

225. Harrison M, Roush J. Age of suspicion, identification, and intervention for infants and young children with hearing loss: a national study. Ear Hear. 1996;17(1):55-62.

226. Thompson DC, McPhillips H, Davis RL, Lieu TL, Homer CJ, Helfand M. Universal newborn hearing screening: summary of evidence. JAMA. 2001;286(16):2000-10.

227. Canale A, Favero E, Lacilla M, Recchia E, Schindler A, Roggero N, et al. Age at diagnosis of deaf babies: a retrospective analysis highlighting the advantage of newborn hearing screening. Int J Pediatr Otorhinolaryngol. 2006;70(7): 1283-9.

228. Rout N, Singh U. Age of suspicion, identification and intervention for rural Indian children with hearing loss. Eastern Journal of Medicine. 2010;15(3):97.

229. Rout N, Parveen S, Chattopadhyay D, Kishore MT. Risk factors of hearing impairment in Indian children: a retrospective case-file study. Int J Rehabil Res. 2008;31(4):293-6.

230. Tanon-Anoh MJ, Sanogo-Gone D, Kouassi KB. Newborn hearing screening in a developing country: results of a pilot study in Abidjan, Cote d'ivoire. Int J Pediatr Otorhinolaryngol. 2010;74(2):188-91.

231. Coenraad S, Goedegebure A, van Goudoever JB, Hoeve LJ. Risk factors for sensorineural hearing loss in NICU infants compared to normal hearing NICU controls. Int J Pediatr Otorhinolaryngol. 2010;74(9):999-1002.

232. Hille ET, van Straaten HI, Verkerk PH, Dutch NNHSWG. Prevalence and independent risk factors for hearing loss in NICU infants. Acta Paediatr. 2007;96(8):1155-8.

233. Mittal R, Ramesh AV, Panwar SS, Nilkanthan A, Nair S, Mehra PR. Auditory neuropathy spectrum disorder: its prevalence and audiological characteristics in an Indian tertiary care hospital. Int J Pediatr Otorhinolaryngol. 2012;76(9):1351-4.

234. Martinez-Cruz CF, Poblano A, Fernandez-Carrocera LA. Risk factors associated with sensorineural hearing loss in infants at the neonatal intensive care unit: 15-year experience at the National Institute of Perinatology (Mexico City). Arch Med Res. 2008;39(7):686-94.

235. Agrawal V, Shukla R, Misra P, Kapoor R, Malik G. Brainstem auditory evoked response in newborns with hyperbilirubinemia. Indian pediatrics. 1998;35: 513-8.

236. Gupta AK, Anand NK. Brainstem evoked response audiometry in neonates. Indian Pediatr. 1990;27(9):1007-9.

237. Nisotakis E, Chalkiadakis V, Marangoudakis P, Tzagkaroulakis A, Nikolopoulos T. Risk factors affecting hearing in neonatal intensive care unit neonates. Journal of Hearing Science. 2016;6(3).

238. Chalkiadakis VF, Geramas I, Marangoudakis P, Kandiloros D, Vlastarakos P, Nikolopoulos TP. Neonatal hearing screening in intensive care units. Journal of Hearing Science. 2014;4(2):9-16.

239. Yakıştıran Betül KM, Yavuz. Is Maternal Iron Deficiency Anemia Associated With Hearing Loss In Healthy Newborns. Selcuk Tip Dergisi. 2020;4(36): 361-66.

240. Nair VS, Das P, Soundararajan P. Prevalence and risk factors of hearing impairment among neonates admitted in NICU in a tertiary care centre in South India. Int J ContempPediatr. 2018;5(4):1342-7.

241. Bener A, Eihakeem AA, Abdulhadi K. Is there any association between consanguinity and hearing loss. Int J Pediatr Otorhinolaryngol. 2005;69(3): 327-33.

242. Karaca CT, Oysu C, Toros SZ, Naiboglu B, Verim A. Is hearing loss in infants associated with risk factors? Evaluation of the frequency of risk factors. Clin Exp Otorhinolaryngol. 2014;7(4):260-3.

243. Barreiro SB, Gonzalez JCF, Acosta AO, Macias AR. HEARING LOSS AND VERY LOW BIRTHWEIGHT. Journal of Hearing Science. 2015;5(3).

244. Hirvonen M, Ojala R, Korhonen P, Haataja P, Eriksson K, Gissler M, et al. Visual and Hearing Impairments After Preterm Birth. Pediatrics. 2018;142(2).

245. Goudy S, Lott D, Canady J, Smith RJ. Conductive hearing loss and otopathology in cleft palate patients. Otolaryngol Head Neck Surg. 2006;134(6):946-8.

246. Fria TJ, Paradise JL, Sabo DL, Elster BA. Conductive hearing loss in infants and young children with cleft palate. The Journal of pediatrics. 1987;111(1): 84-7.

ANNEXURE - I - CONSENT FORM FOR PARTICIPATION IN RESEARCH STUDY

TITLE- Epidemiology of deafness in newborns of NICU and necessary rehabilitation.

Principal Investigator: Dr. Priti S. Hajare

Guide : Dr. R.S. Mudhol

You are being asked to involve your baby in above said research to be conducted at KLE'S Dr. P K Hospital and MRC from July 2012 to June 2012 conducted by Dr. Priti S. Hajare Associate Professor in Dept. of ENT & HNS at J.N. Medical College, Belgaum. We request you to participate in our study as your child is eligible to be included. During the study you will be asked questions regarding your childs and yours present and past medical history and you are suppose to answer to the best of your knowledge.

Newborns in Neonatal Intensive care unit are at high risk of developing hearing loss. When detected in early infancy, hearing loss results in delays in language, communication and intelligence development. Early detection and further intervention with hearing aids and cochlear implant will help your child to have good language, communication and intelligence development.

Procedure Involved: If you agree, in this research your newborn baby will undergo a hearing test called Otoacoustic Emission (OAE) to assess the presence of Hearing loss. Here a probe will be fitted in a ear for 30 seconds and hearing will be tested. If OAE test shows negative result then your baby has to undergo one more test called Brainstem Audio Evoked Response (BAER).This test requires small amount of sedation to be given to a baby for performing the test for 40 minutes so that baby should not move during test.

Risks and benefits involved: As the study does not require any intervention so there are no risks involved. During the period of study, existence of any significant findings in terms of psychiatric disorders or neurological abnormalities will be informed to you and appropriate advice is given for its further management.

Alternatives: Your child's participation in this study is totally a voluntary decision. If you don't want to be a part of the study, you refuse for the same or if you are already a part of the study and if you want to withdraw from the study for any reason, you may do so without any hesitation. Discontinuation from the study for any reason will not affect your current or future relationship with KLES Prabhakar Kore Hospital & MRC.

Privacy and confidentiality: The information provided by you will be known to the Principal Investigator and the members of the research team. This information will remain confidential and will be disclosed to others only with your written permission or if required by the law.

Financial incentives for participation: You will not be paid for participation in the research. There will not be any remuneration for participating in the research and you will not be reimbursed for any expenses, such as bus/train/companion/assistant etc.

Authorization to publish results: When the results of the research are to be published or discussed in conferences by the investigator, no information will be disclosed that will reveal your identity.

Contact details: If you have any questions about this study, you may contact Dr. Priti S. Hajare, Mobile No.9448117313 or Dr. R. S. Mudhol Guide, or Dr. P. V. Patil, Chairman, Institutional Ethical Committee for Human Subjects Research, KLE University's J N Medical College, Belgaum. Ph: 0831-2471350. You will be given a copy of this consent form for your information and for your records.

Statement of Consent:

I,Mr/Mrs._____

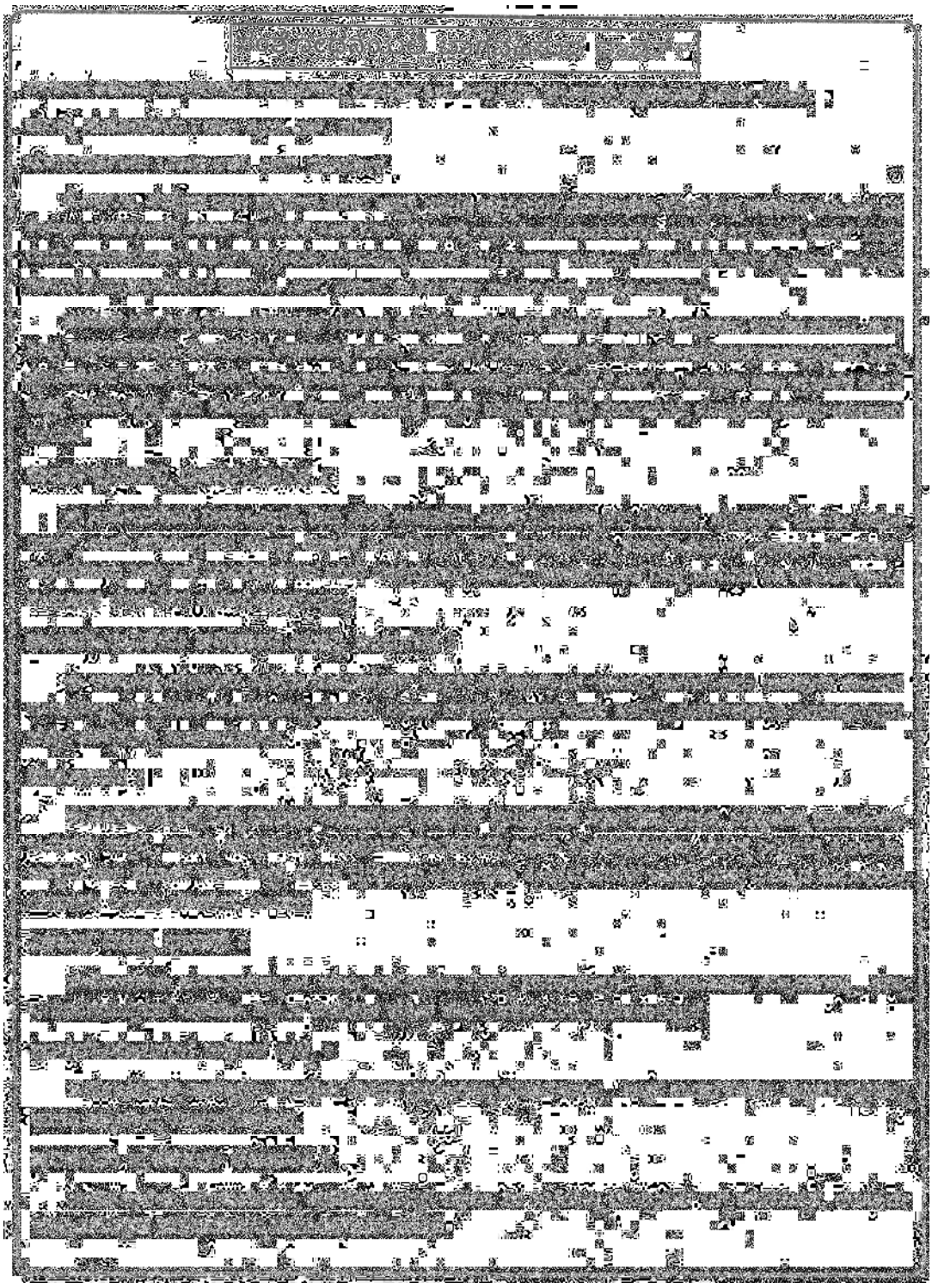
voluntarily agree to take part in this study along with my child. By signing this consent form I am not giving up my legal rights. I may withdraw at any time. I am signing after having read, or been read to me in the vernacular language including risks and the benefits and having all queries cleared.

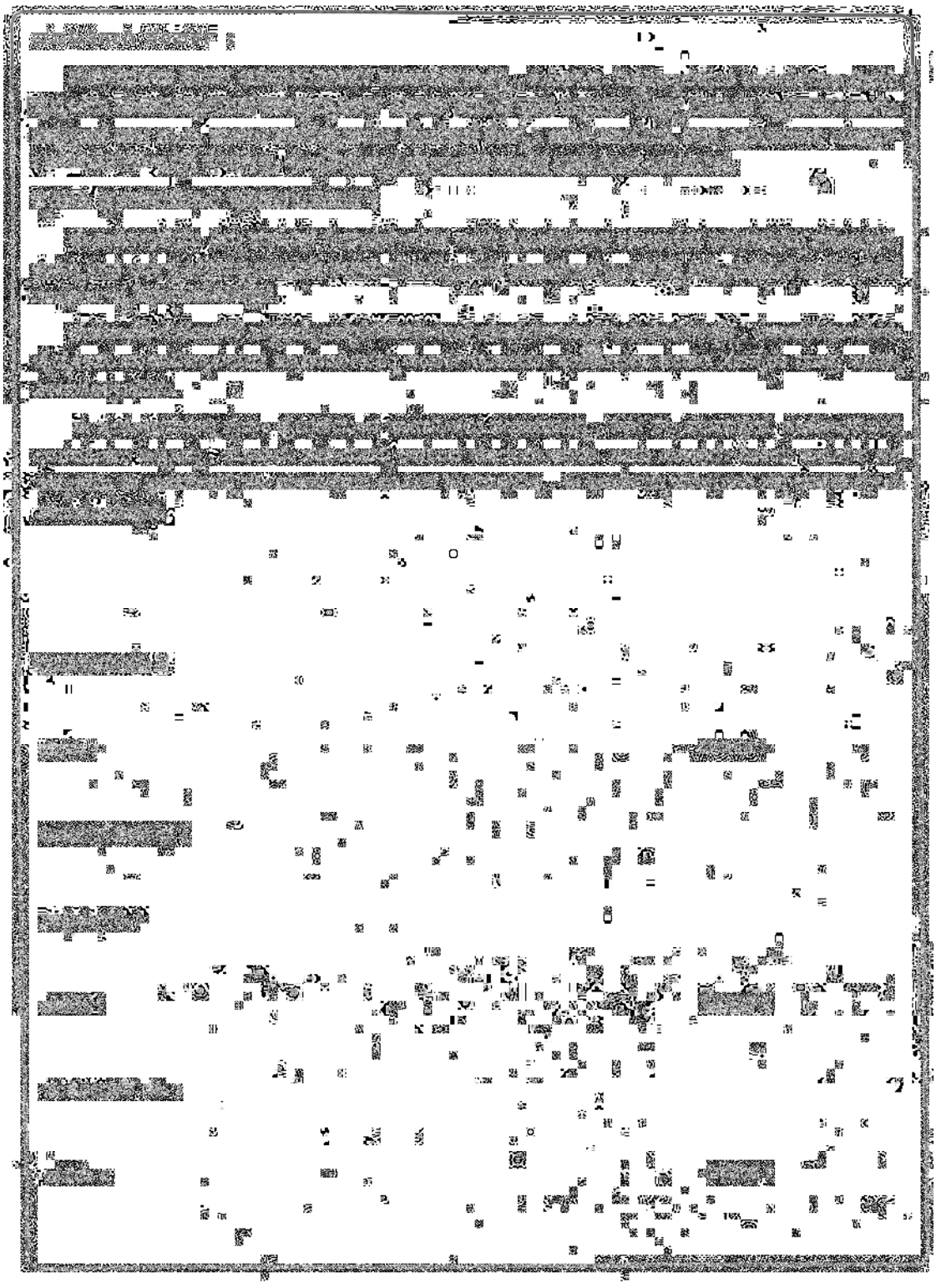
Name & Signature of Parent:

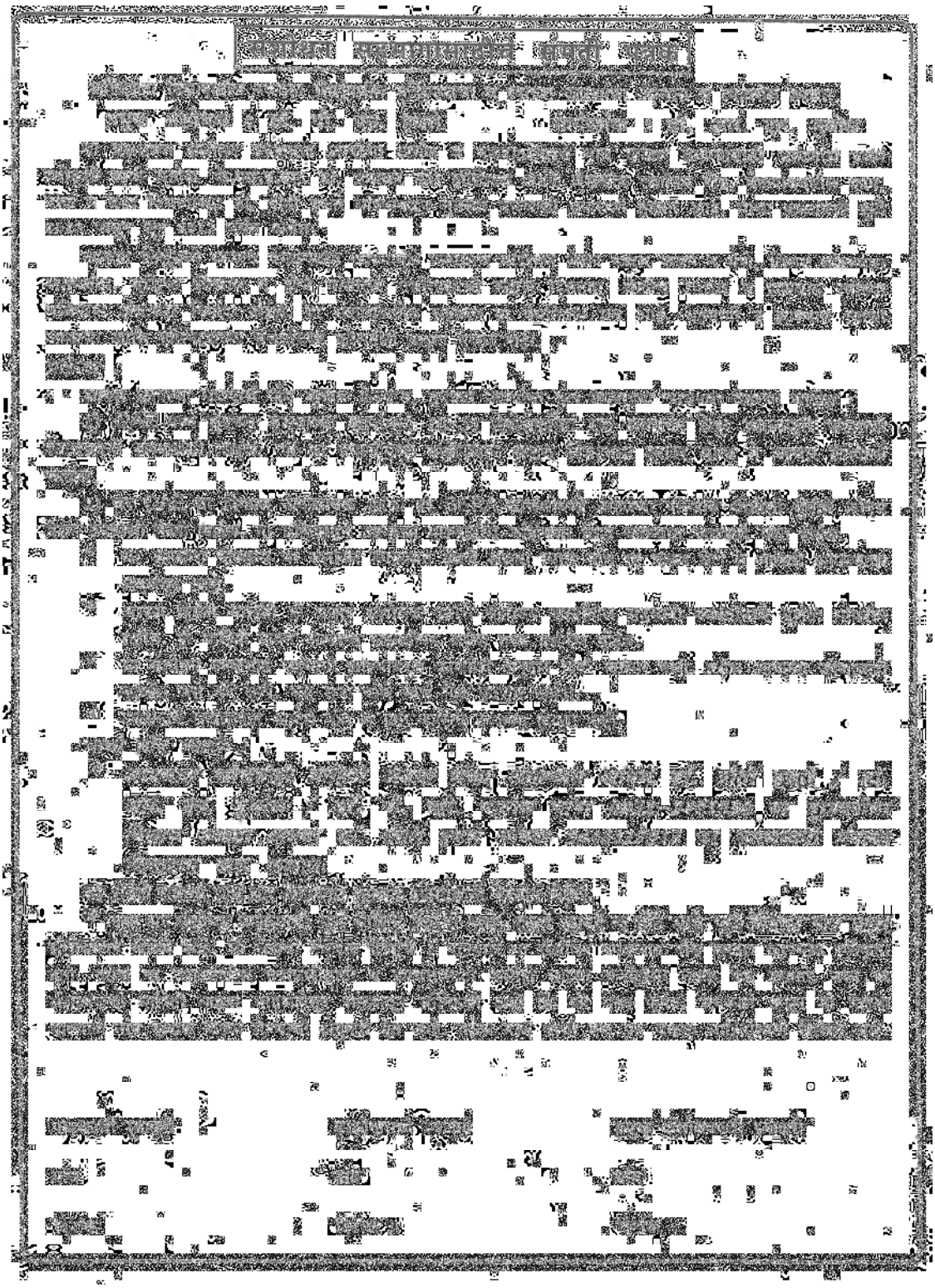
Name & Signature of the witness:

Signature of the investigator

Date:







ANNEXURE - II - PROFORMA

TITLE - Epidemiology of deafness in newborns of NICU and necessary rehabilitation.

Name: **DOB:**

IP NO: **Age:**

Sex: **Consanguineous Marriage:**

Address: **Parental education:**

Phone No:

Socioeconomic status:

History:

i. Maternal factors-

1. Antenatal Care History:

a. Preeclampsia –

b. Hypertension –

c. Rh incompatibility –

d. IUGR—

2. Family history of congenital hearing loss— YES NO

3. Mode of delivery—

a. Normal - b. Assisted c. Caesarean section

4. TORCH Studies – Done -- Not done--

5. Maternal medication –

ii. Risk factors in neonates—

1. Gestational age — Less than 32 wks —

33-36wks —

More than 37wks —

2. Birth weight—less than 1000gms-

1001-1500gms —

1501- 2000gms —

2001- 2500gms --

More than 2500gms --

3. Apgar score— 0-4 at 1 min -

0-6 at 5 min -

4. Craniofacial anomalies -- YES NO

5 .Hyperbillirubinemia – requiring exchange transfusion

S. billirubin level-

6. Neurological factors-

a. Seizures b. Hydrocephalus c. Intraventricular haemorrhage

7 . Presence of infection

a. Respiratory b. Meningitis c. Sepsis

8. Aminoglycoside administration--- Duration - (more than 5 days)

9. Mechanical Ventilation- Duration - (more than 5 days)

10. Stigmata or Syndromes associated with Hearing loss

11. Total no. of days in NICU—Less than 3 days

4-7 days -

8-30 days –

More than 31 days-

ANNEXURE – III – ETHICAL CLEARANCE LETTER

KLE UNIVERSITY
(Formerly known as KLE Academy of Higher Education & Research, Belgaum)
[Declared as Deemed-to-be-University u/s 3 of the UGC Act. 1956 vide Government of India Notification No.F.9-19/2000-U.3(A)]
'Accredited 'A' Grade by NAAC
JNMC Campus, Nehru Nagar, Belgaum-590 010, Karnataka State, India
☎: 0831-2444444/2493779 FAX: 0831-2493777 Web: http://www.kleuniversity.edu.in E-mail: diracademic@kleuniversity.edu.in

Ref.No.KLEU/Ethic/2012-13/D-1215 Date: 16-7-2012

To,
Dr. Preeti Hajare
Ph.D.Scholar,
Dept of ENT, J.N.M.C., Belgaum.

Sub:- Regarding Ethical Clearance.

With reference to the above subject , the KLE University Ethics Committee on Human Subjects for Ph. D Research Project has provided approval for your research project titled **"Epidemiology of deafness in newborns of NICU and necessary rehabilitation" .**

You are requested to report to Ethical Committee of the following:

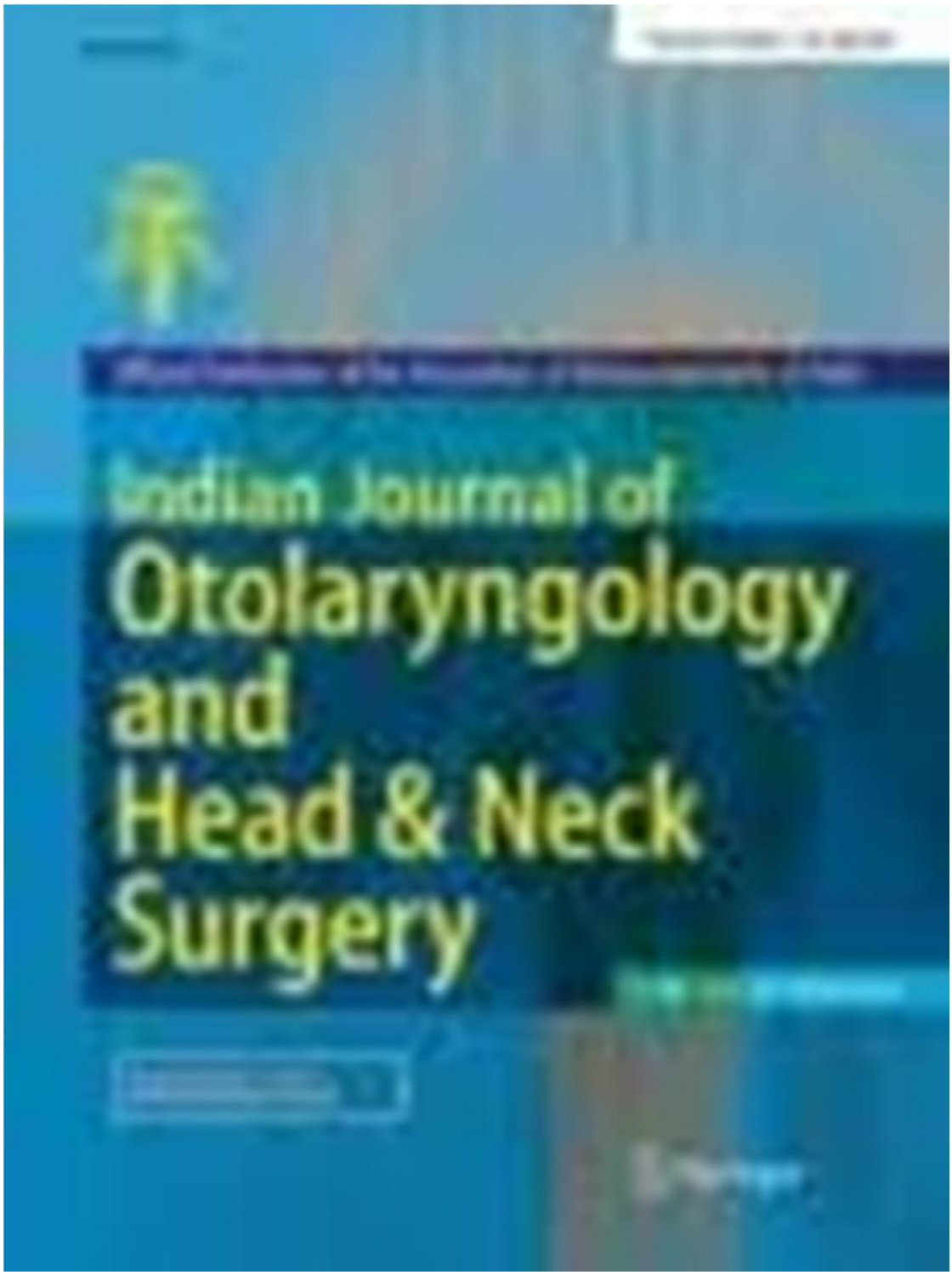
1. Any deviation from or change of the protocol.
2. All serious adverse events.
3. Any changes in study documents.

(Dr. Hema Dhumale)
Member Secretary,
Ph.D. Ethical Committee(Human),
K.L.E. University,
Belgaum.

(Dr.P.V.Patil)
Chairman
Ph.D. Ethical Committee(Human),
K.L.E. University,
Belgaum.

Cc - - The Director Research Foundation, KLE University
- The Director Academic Affairs, KLE University
- The Registrar, KLE University
- Special Officer to Hon. Vice Chancellor, KLE University

ANNEXURE – IV – PUBLICATIONS



Indian J Otolaryngol Head Neck Surg
https://doi.org/10.1007/s12070-021-02683-w

ORIGINAL ARTICLE

Nursery at a Tertiary Care Center

Priti Hajare[1] · **Ramesh Mudhol** [1]

staged screening protocol as per JCIH guidelines with Distortion product Evoked Otoacoustic Emissions (DPOAE) and Automated Auditory Brainstem Responses (A-ABR). According to DPOAE test, 311 from NICU and

month of corrected age where 6 out of 11 showed positive responses from NICU and 3 babies from WBN had profound hearing loss. Data analysis revealed that family

✉ Priti Hajare
drpritihajare@gmail.com

hood onset sensorineural deafness or severe-to-profound hearing impairment [18]. Genetic factors contribute to 50% with no other risk factors and this may go unnoticed in the normal newborn population. NICU babies are a subset of

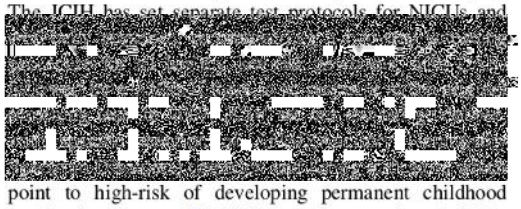
(JCIH) proposed several perinatal risk factors which increase the incidence of deafness by up to 14.1% [22]. Hearing loss being an invisible disability, early detection of

ulation burden there are no established universal newborn hearing screening (UNHS) programs as it is masked by other life-threatening public health diseases [11] JCIH strongly recommends all neonates should undergo hearing

made by 3 months of age, so that it can benefit patients by timely fitting of hearing aids or cochlear implants [1, 19].

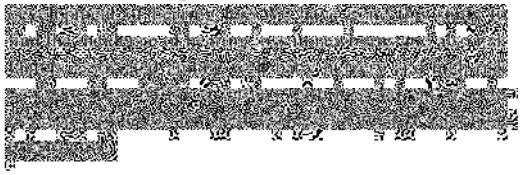
Clinically, it is difficult to detect the early hearing loss in newborns. There are two widely used tests for the

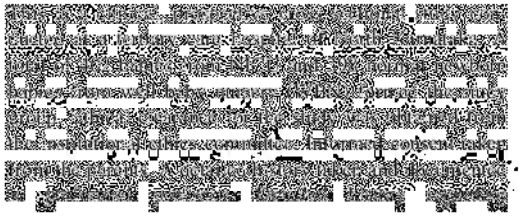
pathway from the eighth nerve to brainstem. As OAE is simple, quick, and inexpensive, it is usually more preferred than BERA for screening as a first step in newborns [27]. The JCIH has set separate test protocols for NICUs and



point to high-risk of developing permanent childhood hearing impairment [1].OAEs are not enough and ABRs should be the basis of the screening in order not to misdiagnose ANSD cases.

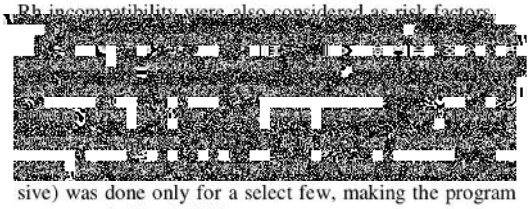
The genetic factors contribute 50–70% of either syndromic (30%) or non-syndromic (70%) profound hearing loss [24]. Over 400 syndromes presenting audiological disorders among other clinical manifestations have been identified, [25]. Non-syndromic deafness is related to mutations of genes that regulate the production of the gap junction protein connexin 26, which causes abnormal cochlear hair cell function. Overall, only 50% of hearing impaired infants have known risk factors, as given by JCIH, a fact that underlines the necessity for UNHS [26]. Several studies have tried to identify and re-evaluate the role and relative importance of certain risk factors in the





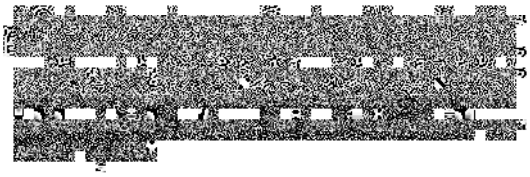
prenatal, natal, demographic details, family history of deafness and consanguinity, gestational history of the mother, intra-natal and postnatal events, and complications and postnatal period were recorded from the mother. High-

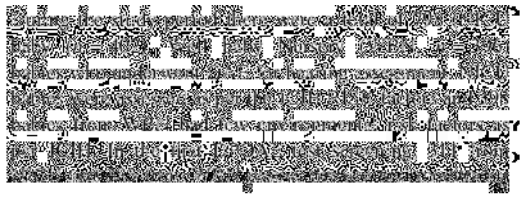
newborns with a history of convulsions, and infection were categorized into high-risk group. Positive antenatal history of drug intake, hypertension, diabetes, hypothyroidism, and Rh incompatibility were also considered as risk factors.



sive) was done only for a select few, making the program more practical and viable.

Portable OAE machine is completely automated analysis systems that gives Result.as PASS (normal functioning) or REFER (poor functioning). Parents of babies who failed (REFER) the screening test were asked for follow up after counseling. Those who passed on the second DPOAE screening were discharged from the study while those who failed second time were referred for further BERA testing, which was performed at 3 month of corrected age after all diagnostic evaluation. Recording of waveforms in BERA was done at different intensities starting at 90 dB. Two replications were obtained at each intensity and peaks I,III, V were marked wherever present. Phone calls and letters were used to contact parents who failed to return for follow up.





had profound hearing loss. Flow chart of children/patient grouping is shown in Fig. 1.

The demographics of NICU baby that includes frequency and percentile of male: female ratio, education level, consanguineous marriage family history of deafness and associated JCIH risk factors is given in Table 1 and the risk factors associated with the babies from well-baby nursing (WBN) is represented in Table 2. Age parameter was significant to the deafness ($p = 0.048$) between

including normal ($p = 0.096$) and assisted delivery ($p = 0.033$) were noted to be significant in NICU babies whereas LSCS caesarean section was insignificant in both the groups (NICU, $p = 0.428$ and WBN, $p = 0.946$). Family history was also assessed for the cause of deafness in both the groups and was found to be extremely significant ($p = 0.003$) in NICU babies and ($p = 0.013$) in well-baby nursing.

WHO [10] lists a number of factors that contribute to

infections which are causative pathogens of congenital infections ($p = 0.022$) and hyper-bilirubinaemia > 10 ($p = 0.001$) was noted to be associated with deafness in NICU babies. Interestingly use of routine medication was not a valid factor associated with hearing loss ($p = 0.220$) in NICU babies. Other factors including gestational age, birth weight (very low birth weight, $p = 0.188$), (low birth weight, $p = 0.149$), (normal weight, $p = 0.670$) were not significant. Similarly, APGAR score of low ($p = 0.698$),

ventilator ($p = 0.730$), craniofacial anomaly, neurological factors and other associated syndromes ($p = 0.534$) were not associated with respect to the deafness.

The Receiver Operating Characteristic Curve (Fig. 2) with a probability cut off at 0.5 suggests that the maximum area under the curve was seen at a sensitivity of 0.769 and specificity of 0.775. Hence all the above-mentioned factors in Table 1 that were analysed and assessed contribute to hearing loss. RoC curve for REFER (Fig. 3) with (CI:

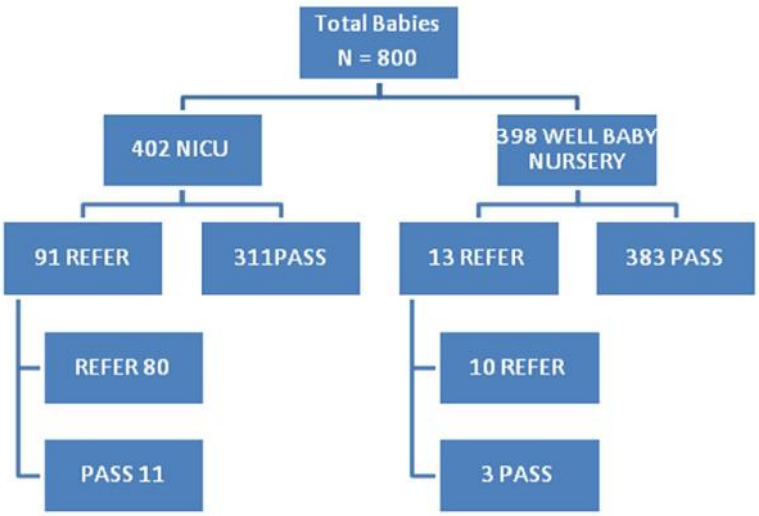
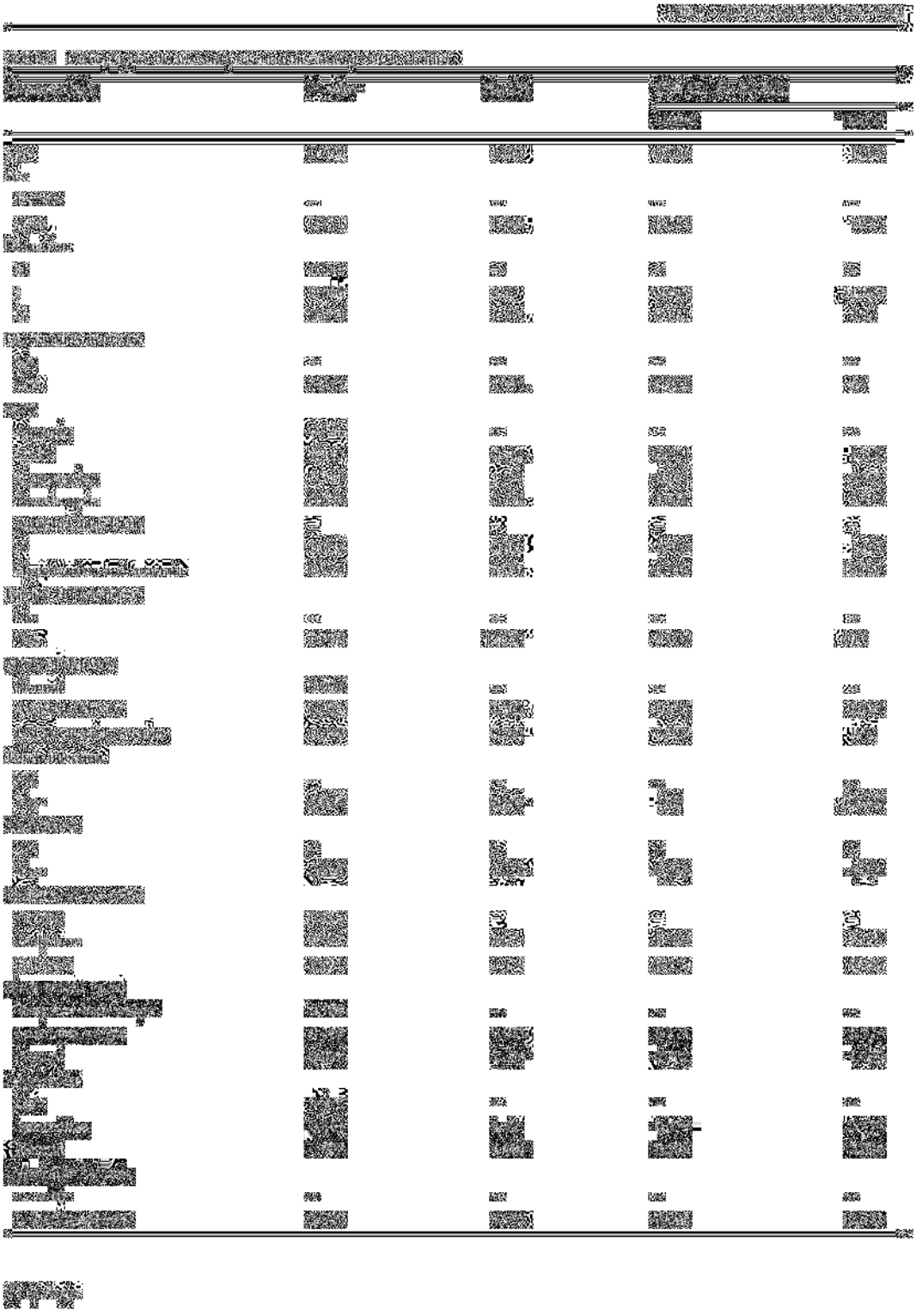
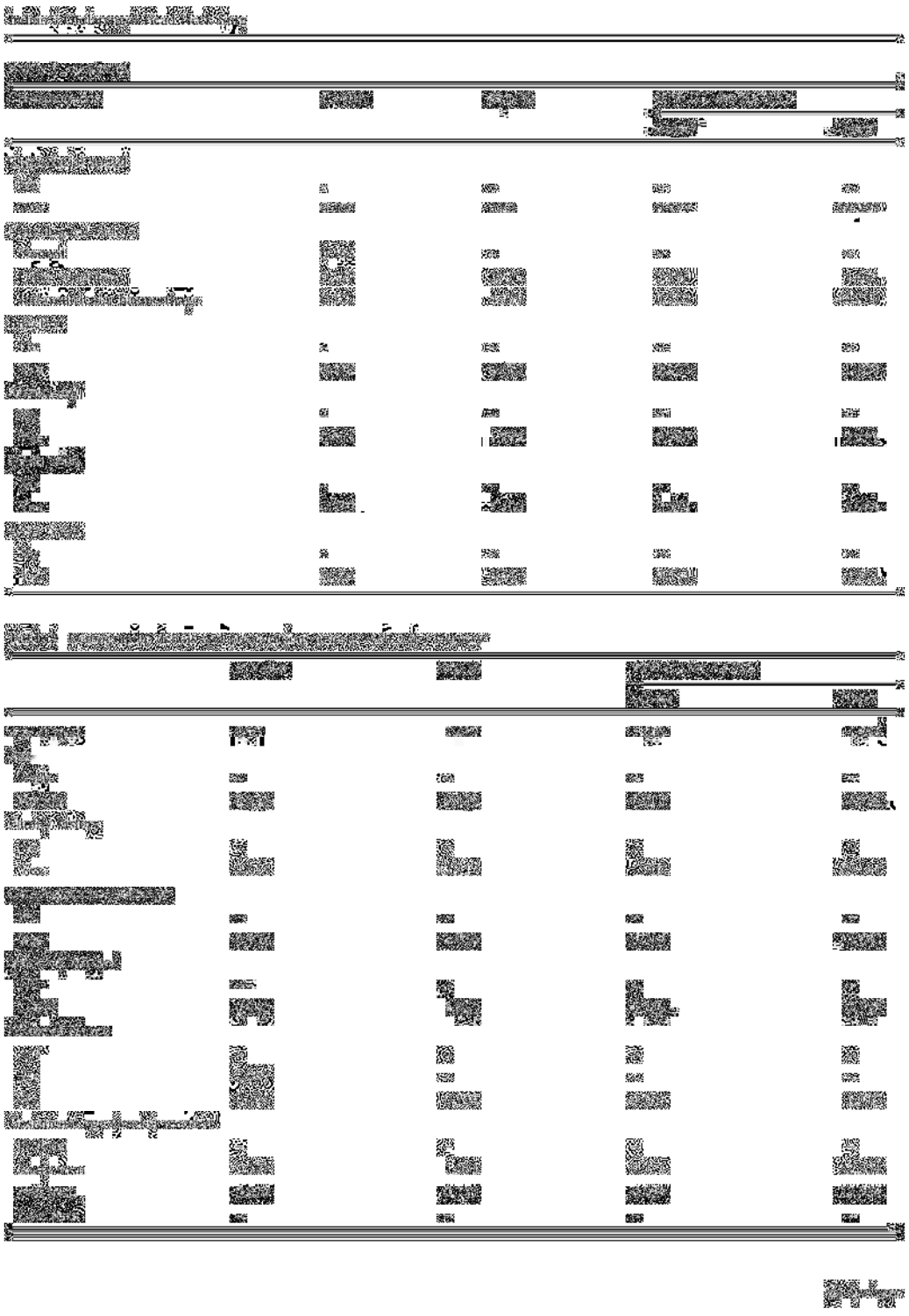


Fig. 1 Flow chart showing selection and grouping of children





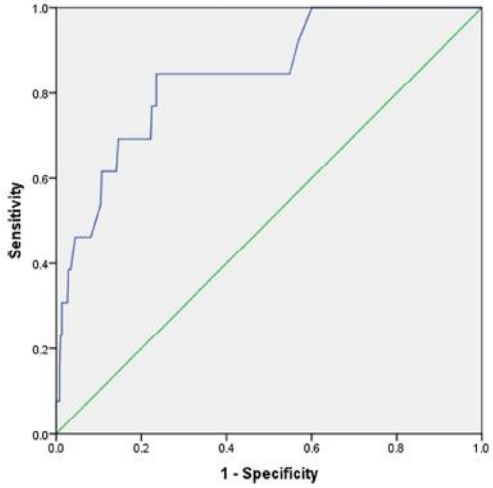


Fig. 2 ROC curve analysis for NICU children. The RoC Curve with a probability cut off at 0.5 suggests that the maximum area under the curve was seen at a sensitivity of 0.692 and specificity of 0.688. This RoC curve is for REFER with (CI: 0.736–0.960). Most of the parameters were associated with the deafness in NICU baby

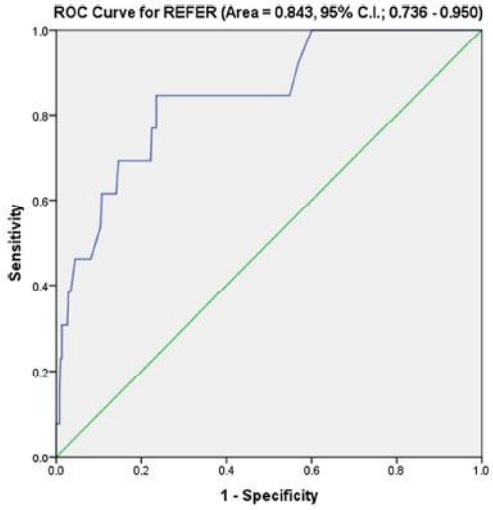


Fig. 3 ROC curve analysis for apparently healthy children. The Receiver Operating Characteristic Curve with a probability cut off at 0.5 suggests that the maximum area under the curve was seen at a sensitivity of 0.769 and specificity of 0.775. Hence all the above-mentioned factors in Table 2 that were analysed and assessed contribute to hearing loss

Sense of hearing has been recently considered as a severe health problem by National Program for the prevention and Control of Deafness (NPPCD). Auditory sense if undetected at an early stage lead to speech impairment, developmental issues and loss of productive years of the child. Therefore detection of hearing loss at the neonatal stage decreases the burden, where intervention therapies can help the children. A two stage screening test involving otacoustic emission (OAE) and Auditory Brainstem response Audiometry (BERA) screening have been recommended [23]. When a Child develops hearing loss with no risk factors involved, first tier genetic screening for the role of the GJB2 gene encoding protein connexin-26 is also recommended since this gene accounts for 20% of sensorineural hearing impairment [6].

Early hearing detection and intervention (EHDI) states that screening infants at 1, 3 and 6 months of age, help in early prognosis and treatment procedures. In a study involving 303 childern, the age of suspicion, diagnosis and intervention was observed to be 18, 72, 84 months respectively. Parent's literacy, father's occupation, consangiuos marriage, socioeconomic status and geographical location of the family determined the age of diagnosis [7]. A prior study by Chary et al. [8] in rural Karnataka, India showed the age of hearing loss recognition between 24 and 36 months.

The current study aims to understand the incidence of deafness in newborn for NICU and WBN nursery groups with various risk factors as proposed by JCIH using DPOAE and BERA. Various studies show the incidence of hearing loss in newborns in India. In one of pilot studies conducted Paul et al. [21] at Cochin the incidence of hearing loss were 10.3/1000 births in NICU and 0.98/1000 births in well baby nursery group. In another study by Nagapoornima, et al. [16] an incidence of hearing loss of 5.6/1000 births was demonstrated. Hearing impairment incidences were higher in the current study much larger than the national average of 4/1000. This may be because our tertiary care centre hospital has large number of high risk deliveries leading to larger caseload of at-risk group. Our finding is in contradictory to the other reports, it might be because of less sample size.

Risk factors that lead to hearing impairment are primarily due to genetic aspects, congenital infections and craniofacial abnormalities. Infectious congenital hearing loss is linked to *Toxoplasma gondii*, Rubella virus, Cytomegalovirus, herpes simplex virus and *Treponema pallidum* [14]. Besides risk factors such as positive history of hearing loss in families, consangiuos marriage, admission to NICU, decreased birth weight, increased gestational age,

toxic drug use, venous access and increased duration of hospital stay have been linked to increased hearing loss. Bilirubin induced neurotoxicity (BINT) also leads to auditory disorder where neonates with extreme hyperbilirubinemia (Total Serum Bilirubin $\geq$ 25 mg/dL) were associated with BINT [2]. Unbound bilirubin is shown to strongly associate with auditory toxicity in 28 out of 100 neonates [2]. Preterm and term infants are affected up to 84% by hyperbilirubinemia during the first week of life. Total serum/plasma bilirubin elevated levels can be mild, transitory or inconsequential in most of the babies [3].

The current study shows that normal and assisted delivery, family history of hearing loss, torch infections and hyperbilirubinemia greater than 10 were strongly

between hearing loss and birth weight of the babies, C-section delivery, medication, gestational age, amino injection, mechanical ventilation, associated syndromes and craniofacial abnormalities was observed. However

factors leading to hearing loss, where five infants failed in both OAE and tympanometry screening. This study screened 2000 live neonates at a tertiary care institute around a 12 month period [4] A study involving 307 children were assessed for etiologies related to mild or severe hearing loss. Stay at NICU, mechanical ventilation, ototoxic drug (aminoglycoside exposure), oxygen need and

and ECMO [20].

A longitudinal cohort study involving 87 babies showed that NICU (65.52%), ototoxicity (48.28%), hyperbiliiru-

score, infections, gestational age also played a major role [22–24]. In our study, family history of deafness in NICU and WBN group has statistical significance ($p = < 0.001$). Ganapathy et al. [10] conducted study on association of family history and consanguinity that showed 18.6 and 39.5% of babies having hearing loss in India. This study was also supported by an analysis on Mumbai school children by D'Mello et al. [9]. Family history of hearing loss is seen in different studies in India, with 25% in Karnataka and in Kerala, 45% had a family history of deafness with mutations in GJB2 gene [12, 15].

Risk factors contribute to the burden of hearing impairment in developing countries. Most cases of deafness in India are preventable as per WHO report which is

challenges that are faced to avail the services related to diagnosis of hearing loss in rural children include cultural, educational, financial and navigational barriers [9]. Therefore proper medical and counseling regimens should

Universal Newborn Hearing Screening (UNHS), especially for NICU patients who are having multiple risk factors for hearing loss. Multicenter studies incorporating large sample size should be done at different levels of health care in order to get a clearer picture of hearing status of babies in developing countries. IN India, majority of hospitals do not conduct universal or high risk screening. In such a situa-

participants.

Funding Present study is not supported any external funding source.

10. WHO. Multi-country Assessment of national capacity to provide hearing care. 2013. Available from: https://www.who.int/pbd/publications/WHOReportHearingCare_Englishweb.pdf?ua=1
11. Office of the Registrar General & Census Commissioner, India.

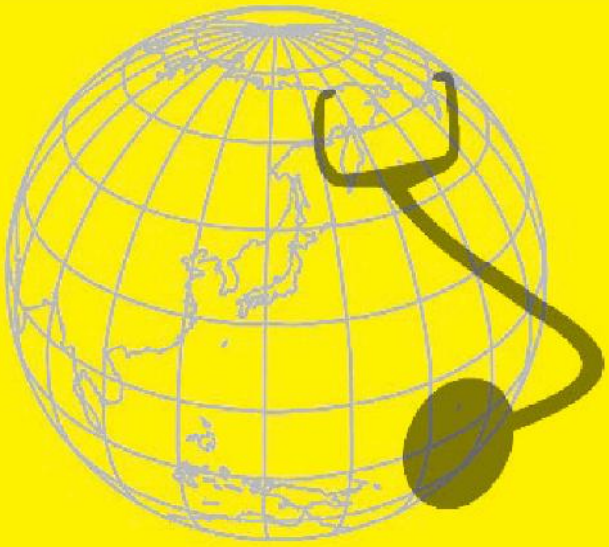
Head Neck Surg 25:370–377
25. Selvarajan HG, Arunachalam RK, Bellur R, Mandke K, Nagarajan R (2013) Association of family history and consan-

ISSN-0976-0245 (Print) • ISSN-0976-5506 (Electronic)

Volume 6 | Number 4 | October - December 2015

Indian Journal of Public Health Research & Development

An International Journal



Website:
www.ijphrd.com

Growing Burden of Paediatric Deafness - Challenges in Diagnosis and Rehabilitation in India

Priti S Hajare[1], R S Mudhol[2]

[1]Associate Professor, [2]Mudhol, Professor, Department of ENT & HNS, Jawaharlal Nehru Medical College, Belgaum

ABSTRACT

Paediatric deafness is a handicap affecting approximately 4-6/1000 newborns. The primary justification for early identification of deafness in children relates to the direct impact on their speech and language development which is further related to the academic, social and emotional impairment and disability. In a developing country like ours, the detected number of pediatric deafness cases may be like a tip of an iceberg as 70% of population lives in rural India where due to lack of basic medical infrastructure facility and social factors most of the cases are unnoticed till the age of 3-4 yrs, when the age of complete speech development occurs. So the delay in detection of deafness is very common amongst general population. Various studies has been done in India in different parts in relation to the incidence, causes, risk factors, etc but being the second highest population in the world , the exact number and percentage of deaf children is difficult to calculate. Various organizations including National programme for detection of deafness are working towards the early identification and rehabilitations measures but we still need to go a long way.

Keywords *– Paediatric deafness, detection and prevention, rehabilitation.*

INTRODUCTION

Hearing loss is a social and psychological handicap which adds to the emotional and financial burden of the family and economical burden to the country. Detecting exact number of cases is a major challenge in developing countries which is very important for early rehabilitation. In many developed countries Universal newborn hearing screening (UNHS) is mandatory along with routine newborn screening methods. In a developing country like ours, due to financial constraints, and limited resources hearing loss screening is not a compulsory program. Failure to detect HL can cause speech and language deficit lifelong. Various government and non government organizations needs to come together for early detection and rehabilitation of hearing loss to reduce the burden of the society and country.

THE GLOBAL BURDEN OF DEAFNESS

In 2012, WHO released new estimates on the magnitude of disabling hearing loss. The estimates are based on 42 population-based studies. According to these there are 360 million persons in the world with disabling hearing loss (5.3% of the world's population) and 328 million (91%) of these are adults (183 million males, 145 million females) and 32 (9%) millions of these are children. The prevalence of disabling hearing loss in children is greatest in South Asia, Asia Pacific and Sub-Saharan Africa[1]. The prevalence increases with age, i.e. prevalence in children is 1.7%, but in adults aged 15 years or more, it is around 7%, rapidly increasing to almost one in three adults older than 65 years. As per WHO , deafness is among the 20 leading causes of the global burden of disease and one of only nonfatal conditions. Also HL is the second most common cause of years lived with disability (YLD) accounting for 4.7% in India[2]. The problem of deafness is disproportionately high in the Southeast Asia region with a prevalence ranging from 4.6% to 8.8%.[3].Globally 90% of unidentified childhood hearing loss comes from developing countries and less than 2.5% of these children get hearing aids and less than 10% will never have access to early intervention[1]

DEMOGRAPHIC STATUS OF DEAFNESS IN INDIA

According to NCDS statistics; India has a population of over 1 billion and the identified number of deaf children are 3 million with 25,000 born every year and 90% of deaf children live in rural areas. In India, 13.93% of the school going population (6- 14 years) is at risk of having a hearing disorder [10]. 50%of deaf children in school dropout at the age of 13 [3]. The National Sample Survey Organization estimates, that the prevalence of speech disability is 8.3% in the urban areas and 8.9% in rural school going children [4]. This estimate may be on a lower side as the data is collected by the primary school teachers and social workers. In India, not many studies are being conducted to know the exact number of deaf children region wise due to population burden. Nationwide disability surveys have shown that hearing loss to be the second most common cause of disability.[2] Very few demographic statistics available, which are either outdated or unreliable because some people may not wish to identify themselves as having a hearing loss, or the question forms may not ask directly if a person has a hearing loss. The Census Bureau offers demographical statistics on disability and employment, which do not mention age of onset of hearing loss.[3] As per NCHC statistics 12 out of every 1,000 persons with hearing loss is under 18 years of age which implies that there are chances that at least one student in each school will have a hearing loss.[4]

AETIOLOGY OF DEAFNESS – GENETICS AND ENVIRONMENT

About 50% of children detected with hearing loss are having congenital deafness and out of this 30% have syndromic hearing loss with more than 500 syndromes are associated with childhood hearing loss.[3] That means they are associated with some or other anomalies, and hearing screening is done along with other screening tests to detect deafness. Other 70 % cases are of non syndromic origin and usually go unnoticed till late childhood. . Most of the deafness of genetic origin has been attributed to mutation in gene coding Connexin 26, which is a protein that forms channel for the potassium ion transduction in the cochlear hair cell. In the study on prevalence of this gene in Indian population the prevalence of this gene was around 40% of all cases [3]. Prenatal genetic counselling is essential in families to rule out any other environmental risk factors causing deafness. .

The Joint Commission on infant hearing (JCIH) along with AAP (American Academy of Pediatrics) has outlines the various environmental risk factors and principles and guidelines for early hearing loss detection and intervention programme in 2004.[6] Table 1 shows the risk factors given by JCIH. Many of these risk factors require an intensive care management for the new born and a routine screening for all intensive care babies can detect early hearing loss.

Table 1- JCIH risk factors for Hearing Loss in NICU babies

1.	Family history of childhood congenital hearing loss.
2.	Congenital infections such as TORCH.
3.	Craniofacial anomalies including morphological abnormalities of pinna, ear canal, nose and throat.
4.	Birth weight less than 1500 gms.
5.	Hyperbilirubinimia needing exchange transfusion.
6.	Ototoxic medications including but not limited to aminoglycosides used in multiple courses or in combination with loop diuretics.
7.	Bacterial meningitis.
8.	APGAR score of 0-4 at 1 minute or 0-6 at 5 minutes.
9.	Mechanical ventilation for 5 days or longer, ECMO or persistent pulmonary hypertension.
10.	Stigmata of other findings associated with a syndrome known to include sensorineural and or conductive HL.

In addition, consanguineous marriages which is more prevalent in some South east Asian countries imposes a higher risk for genetic deafness [7]. In India, the three southern states of Karnataka, Tamil Nadu (20%) and Andhra Pradesh it is more common and was rare among the communities of North India. [3] In another study done it was found that 199 of the 383 (52 per cent) children had the problem resulting from consanguineous marriages in which the Connexin 26 gene had caused deafness.

Other factors like Middle ear infections such as chronic suppurative otitis media (5.2%) and otitis

media with effusion (3%) are other leading causes of hearing loss in children as per WHO.[1] It has been noted by WHO that half the causes of deafness are preventable and about 30%, though not preventable, are treatable or can be managed with assistive devices such as hearing aids.[1] Thus, about 80% of all deafness can be avoidable.

CURRENT SCENARIO FOR DETECTION AND PREVENTION OF PAEDIATRIC DEAFNESS IN INDIA

The Government of India initiated the National Program for Prevention and Control of Deafness (NPPCD) in 2006 as a pilot project and was implemented in 25 Districts in 10 States and 1 in Union Territory. The objective of the program is the prevention and early identification, rehabilitation and strengthening of the existing inter-sectoral linkages and institutions and infrastructure development. For the prevention of auditory impairments, it promotes outreach activities and public awareness through innovative and effective information, Education and Communication (IEC) strategies at PHC level and along with NRHM programme. According to NPPCD approximately 63 million no. of children affected in India.8 Long term objective of NPPCD is to prevent and control major causes of HL, so as to reduce the total disease burden by 25% of the existing burden by the end of 12th Five Year Plan. [8]

Many nongovernmental organizations (NGOs) operate in India, providing support to deaf schools, offering vocational training, etc. There are around 9 deaf associations and 11 NGO in India in different states.[9] It conducts regular camps in various parts of the state towards deafness detection and awareness. India has several deaf education organizations at the national, state, and regional levels that set up schools for the deaf and hard of hearing and offer speech and auditory therapy. Even deaf women in India have their own organizations. Also N.A.D (National association for Deaf) aims to be a body that is truly representative of all deaf people across India. This includes deaf people in every state in India. Currently in India there is not a strong deaf movement, so N.A.D. aims to represent deaf people in order to demand their rights from the Government and policy makers[9]. N.A.D. organizes various national workshops with the aim of setting up India's first association of Sign Language interpreters., India has world's largest cultural diversity with 22 official languages and 200 spoken languages. Much language support in the form of sign language can be provided to the deaf children. The Association of sign Language Interpreters has been launched in June 2007. Sign language interpreting is growing as a profession in India. There is a professional organization for Indian sign language interpreters, the Association of Sign Language Interpreters set up by The Rehabilitation Council of India offers interpreter training, maintains a National Directory of Interpreters, and provides training to teachers of the deaf. Other government agencies like Ali Yaver Jung offer Bachelor's degree in deaf education and has a website devoted to jobs for the deaf in India.[9]

In 1920 , there were only 10 schools for the deaf in India but now there are around 130 Deaf schools in India in all states out of which maximum numbers are in Andhra Pradesh (20),Tamil Nadu(20), Gujrat (18), Orissa (17), Kerala (11), and Karnataka (10). [9]

The estimated number of ENT specialists and otologists in India are around 7000 and 2000, respectively. The audiologist to population ratio was found to be 1:500 000 and the ratio of speech therapists to the deaf population was 1:2000[7]. A total of 25% of Indian children under the age of 14 require the support of an audiologist and a speech language pathologist (ASLP). At present there are only 1567 registered ASLP in India [11] which is too little to fulfill the need. In addition the maximum numbers of professionals are based in cities which accommodate less than 30% of Indian population. Most of the training institutes are in cities and function on an IBR (Institution Based Rehabilitation) model.

PREVENTIVE MEASURES

A variety of procedures are used in hearing screening programs for infants and neonates. However any test for screening must be non-invasive, less time consuming and pose no risk of injury to the infant; it should be highly sensitive and specific and should not be affected by the environment and the test should correctly identify auditory status in both high risk and well baby population if it is to be used in universal hearing screening programs (UNHS). The Joint Committee on Infant Hearing recommends identification of hearing loss by 3 months and commencement of intervention by 6 months of age [13].

In India, different states are adopting UNHS at least in high risk cases as identified by pediatricians.

Cochin has adopted a centralized Hearing screening program way back in 2000. OAE is the most evolutionary and surprising auditory phenomenon which has changed the diagnosis of hearing loss in newborn. In India aural rehabilitation is initiated by the parents hence gets significantly delayed. As per study conducted in eastern India children with HI are detected at a mean age of 3.03 years and aural rehabilitation commences by a mean age of 7.38yrs[12]. Various factors have been identified to explain this delay including child rearing practices, ignorance about the importance of intact hearing sensitivity and critical age for speech development along with lack of aural rehabilitation services [12].

REHABILITATION

According to WHO, current production of hearing aids meets less than 10% of global need. In developing countries, less than one out of 40 people who need a hearing aid get the one. The lack of availability of services for fitting and maintaining hearing aids, and the lack of batteries are problems in many low-income countries [1]. Making properly-fitted, affordable hearing aids and providing accessible follow-up services in all parts of the world will benefit many people. Some hearing aid companies have India subsidiaries eg Widex and Phonak which has given free hearing aids to children in India. India also has its own hearing aid manufacturers, such as Elkon and Arphi[5]

People who develop hearing loss can learn to communicate through development of lip-reading skills, use of written or printed text, and sign language. Teaching in sign language will benefit children with hearing loss, while provision of captioning and sign language interpretation on television will facilitate access to information. Deaf people in the country are reportedly working towards a single sign language. Indian sign language (ISL) is a loose collection of mutually overlapping dialects spoken by up to 1,500,000 or more users. Primary dialects are Delhi, Kolkata, Mumbai and Bangalore-Chennai Signs. Delhi dialect is the most influential. Over 75% of signs from all regions are related. Dialects are not related to deaf school usage, but vocational programs often use it.[5]

Another important part of rehabilitation is Cochlear implant. Approximately 324,000 people worldwide have received cochlear implants till 2012, maximum cases in are in developed countries due to the high cost of the device, surgery and post-implantation therapy. In India, only about 5,000 cases are done. CIGI- Cochlear Implant group of India was started in 2003 with 15 centers across and 500 operated cases till now. Implant manufacturing company does not give India subsidiaries.

CONCLUSION

WHO has stresses upon the significant shortage of human resources to address the issue of deafness all over the world. In a human resource driven society like ours, the socioeconomic burden of deafness causes lag in growth. Recognition of this fact is slowly gaining ground.

The strategies included in the NPPCD, if implemented with political will and strong leadership will decrease the magnitude of ear problems and prevent avoidable deafness in India and partnerships with different organizations, professionals and personnel remain critical to the success of the program. In the supportive environment facilitated by the launch of NPPCD, it is imperative to take firm and enthusiastic actions to reduce the burden of deafness in India. It is crucial to understand factors which delay the commencement of aural habilitation in children. Alleviating the factors will help reducing the delay to an extent in a developing country like India where universal newborn hearing screening programs is yet to begin at a national level. This article attempts to convince public health expert, administrators and policy makers that Hearing loss is a public health issue, should be dealt very seriously and on priority bases.

Acknowledgment- Nil

Conflict of Interest – None declared

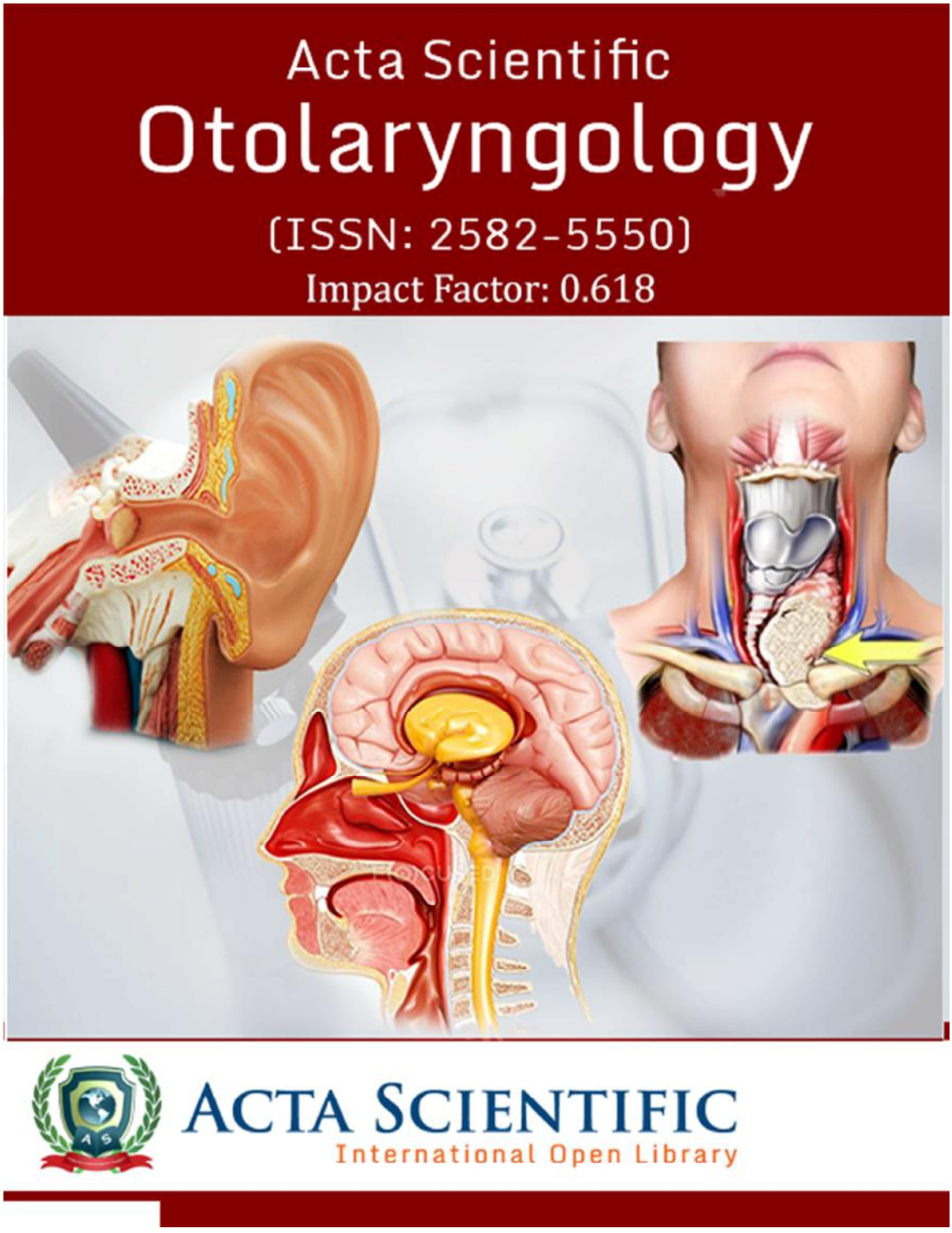
Source of Funding – Nil

Ethical Clearance- Taken from the college committee.

REFERENCES

1. World Health Organization- State of hearing and ear care in the South East Asia Region. WHO Regional Office for South East Asia. WHO-SEARO. SEA/Deaf/9. Available at http: //www.searo.who.int/LinkFiles/Publications_ HEARING_&_EAR_CARE.pdf

2. Suneela Garg, Shelly Chadha, Sumit Malhotra, A. K. Agarwal. Deafness: Burden, prevention and control in India. The National Medical Journal of India Vol. 22, No. 2, 2009; 79-83.
3. Ghosh M, Vijaya R, Kabra M. Genetics of deafness in India. Indian J Pediatr 2004; 71:531-533.
4. National Sample Survey Organization. Hearing Impairment. Cited in: Rehabilitation Council ofIndia. Status of Disability in India- 2003. NewDelhi: Authors 1991; 122.
5. Census of India, 2001. Government of India Ministry of home affairs, office of registrar general and census commissioner, India. www.censusindia.gov.in. dated 15.06.10.
6. Joint Committee on Infant Hearing. Year 2007 position statement: Principles and guidelines for early hearing detection and intervention, 2007; www.asha.org/policy on 13.09.09.
7. Tadmouri G O,Nair P, Obeid T ,Al Ali MT, Al Khaja N, Hamamy HA.Consanguity and reproductive health among Arabs.Reproductive Health 2009;6:17.
8. NPPCD-National Programme for prevention and control of deafness –Ministry of health and family welfare, India
9. Deaf Community – India, Rapidly Developing Deaf Community By Jamie Berke Updated April 28, 2009.
10. Kumar S, D'Mello J. Identifying children at-risk for speech and hearing disorders: A preliminary study from Hyderabad, India. Asia Pacific Disability Journal 2006; 17: 101-108.
11. Goswami SP, Samasthitha S, Kumar S. ISHA Directory 2010. Mysore. Indian Speech and Hearing Association
12. Nachiketa Rout, Uday Singh. Age of suspicion , identification and intervention for rural Indian children with hearing loss. Eastern Journal of Medicine 15(2010), 97-102
13. American Speech-Language- Hearing Association. Guidelines for audiologists providing informational and adjustment counseling to families of infants and young children with hearing loss birth to 5 years of age (guidelines), 2008; www.asha.org/policy on 20.07.09.


Acta Scientific
Otolaryngology
(ISSN: 2582-5550)
Impact Factor: 0.618
ACTA SCIENTIFIC
International Open Library

ACTA SCIENTIFIC OTOLARYNGOLOGY (ASOL)

Volume 2 Issue 5 May 2020

Research Article

An Epidemiological Study of Deafness in Children Below 5 Years Age Group Associated with Neurological Deficits - A Tertiary Hospital-Based Prospective Study Using Otoacoustic Emissions

Priti S Hajare[1], Vijay Yeramalla[2] and TVRK Prasad[2]*

[1]*Professor, Department of ENT and Head and Neck Surgery, J.N. Medical College, KLE Academy of Higher Education and Research, Belagavi, Karnataka, India*

[2]*Post Graduate Resident, Department of ENT and Head and Neck Surgery, J.N. Medical College, KLE Academy of Higher Education and Research, Belagavi, Karnataka, India*

***Corresponding Author:** TVRK Prasad, Post Graduate Resident, Department of ENT and Head and Neck Surgery, J.N. Medical College, KLE Academy of Higher Education and Research, Belagavi, Karnataka, India.

Received: March 06, 2020

Published: April 30, 2020

Abstract

Background: Hearing impairment is a condition where the ability to detect certain frequencies of sound is completely or partially impaired. In the early years of life, hearing ability is critical for the development of speech, language, and cognition. The prevalence of hearing loss associated with neurological conditions in preschool children is poorly portrayed.

Objective: To assess the prevalence of hearing loss in children below 5 years of age associated with neurological deficits by doing Otoacoustic Emissions.

Methodology: A prospective study of preschool children from KLE'S Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi was undertaken from December 2018 to December 2019. The children were subjected to distortion product evoked otoacoustic emission (DPOAEs). A total of 108 patients underwent the first screening, 8 patients lost for follow up at the end of 3 months and were excluded from the study.

Results: All the 100 children were divided into 3 age groups, as less than or equal to 2 years, 2 - 4 years and more than or equal to 4 years. 20 (20%) children were in the first group, 23 (23%) in the second group and majority 57 (57%) in the third group respectively. 6 children had a family history of hearing loss and 13 children had a history of consanguineous marriage. Bilateral hearing loss was detected in 10% of children with neurological deficits in the first screening. In the second screening, 4 children were confirmed to have hearing loss, hence the prevalence of hearing loss was estimated to be 4%.

Keywords: Hearing Impairment; Neurological Deficits; Otoacoustic Emission; Screening; Speech and Language Development

Abbreviations

OAE: Otoacoustic Emissions; DPOAEs: Distortion Product Evoked Otoacoustic Emissions; TEOAEs: Transient Evoked Otoacoustic Emissions; OHCs: Outer Hair Cells; dB: Decibel; NO.: Number; SNHL: Sensorineural Hearing Loss; WHO: World Health Organization

Introduction

Hearing impairment occurs when there is a reduction in auditory acuity [1]. It is second most common impairment globally affecting 1.33 billion (1.26 - 1.40 billion) people all over the world, among16 million children according to World Health Organization (WHO) 2012 [2]. Children born in resource-rich countries compared to children born in resource-poor countries are nearly twice as likely to have hearing loss [1]. Children with moderate to severe hearing disorders are noticed early, as compared to children with a mild or unilateral hearing disorder. Parental education, family livelihood, other social factors may influence the time of screening and treatment [1,2].

The early diagnosis of pre-lingual deafness is important to prevent the consequences of hearing impairment on language, speech, social-emotional development, and educational achievement [2-4]. Early diagnosis and intervention by the age of 6 - 12 months, enables the normal development of language and speech, regardless of the degree of hearing loss [5,6].

Recent studies find neonatal intensive care unit admission, low birth weight, metabolic disorders, parental consanguinity, syndromes, and postnatal infection as the risk factors for newborn hearing impairment [2,5]. Children with neurological illness can be associated with congenital or delayed-onset hearing impairment. Hearing impairment may involve peripheral auditory structures such as middle ear or cochlea or auditory nerve and central ner-

Citation: TVRK Prasad., *et al.* "An Epidemiological Study of Deafness in Children Below 5 Years Age Group Associated with Neurological Deficits - A Tertiary Hospital-Based Prospective Study Using Otoacoustic Emissions". *Acta Scientific Otolaryngology* 2.5 (2020): 15-18.

vous system [7]. Acquired Hearing loss in children is 60% preventable and 40% non-preventable. Out of preventable causes, infectious is 31%, birth-related causes are 17%, others 8%, ototoxic medication 4% [8].

Otoacoustic emissions are a marker of cochlear function [9,10]. OAE is an Electrophysiological, objective and non-invasive low-intensity sounds generated by the active movement of the outer hair cells (OHCs) of the cochlea used commonly for newborn screening and diagnostic testing of infants in the first 6 months of age [11-14]. They can also prove of value in children of any age when behavioral testing has failed to produce reliable results, in particular those with neurological disorders with severe learning or communication difficulties [13,14]. OAE is quick, minimally invasive and economical [15].

Distortion-product Otoacoustic emissions (DPOAEs) are generated by pure tones separated by a specific frequency difference. The two components are hypothesized to be generated by different mechanisms; the component from the overlap region is due to an outer hair cell-based nonlinear generation process and the component of the other form is linked to a process of coherent linear reflection and referred to as place fixed [16].

Hearing impairment can be associated with neurological deficits such as Down syndrome, microcephaly, macrocephaly, hemiplegia. Down syndrome is the most commonly occurring genetic abnormality involving nearly 1 in 700 births. Some studies show that mild hearing loss of less than 15dB hearing loss can also severely impact speech perception and development [17].

Abnormal head size in children classified into microcephaly and macrocephaly. The direct relation between sensorineural hearing loss and abnormal head size is rare in the literature in developing countries. Cause of sensorineural hearing loss in microcephaly may be due to the effect of chromosomal abnormalities, congenital and postnatal infection on the auditory system [18].

There is inadequate literature on hearing impairment associated with neurological conditions among preschool children (under five years age) as per Indian literature. This study is carried out to determine the prevalence, diagnosis, and management of hearing impairment due to neurological deficits using Otoacoustic emission.

Materials and Methods

This was a prospective hospital-based study conducted for children less than 5 years of age with the neurological disorder at ENT OPD of KLE'S Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi, India.

Duration of the study period from December 2018 to December 2019.

The children were examined for the presence of wax in the external auditory canal, Otitis media with effusion, retraction of the tympanic membrane and these conditions were treated. Only those children who had complete resolution of these confounding factors were included in this study.

After taking informed consent from the parents/guardians of children, they were subjected to DPOAEs at 2000 Hz, 4000 Hz and 6000 Hz.

They were subjected to DPOAEs in a quiet room to prevent any interference from noise. The results of the first screening were noted for both ears. All cases were labeled as either PASS or REFER depending on the result obtained on the OAE machine. A second screening was done after 3 months.

A total of 108 patients underwent the first screening. 8 patients lost for follow up at the end of 3 months and were excluded from the study hence final sample size was 100.

Results

In the study out of 100 children evaluated 55 were males and 45 were females (Table 2). They were divided into 3 age groups as less than or equal to 2 years, 2 - 4 years and more than or equal to 4 years. 20 (20%) children were in the first group, 23 (23%) in the second group and the majority 57 (57%) in the third group. 6 children had a family history of hearing loss and 13 children had a history of consanguineous marriage.

During the first screening, bilateral hearing loss was diagnosed in 10 (10%) children with neurological deficits. During the second screening, hearing loss was diagnosed in 4 (4%) children. Out of which 2 (2%) cases were having cerebral palsy, other cases were Down syndrome and Hemiplegia each respectively. Hence the prevalence of hearing loss with neurological deficits was estimated to be 4% (male 3%, female 1%).

Discussion

Theoretically, the period for the development of the auditory system and speech commences in the first 6 months of life and continues through 2 years of age. Hearing experience in the first 6 months of life, before meaningful speech begins, affects the perception of speech and their capacity to learn. Any hearing impairment in the first year of life is believed to compromise speech and language acquisition as well as cognitive and social development [1,3]. However, it is widely reported that targeted high-risk screening can

Citation: TVRK Prasad., *et al.* "An Epidemiological Study of Deafness in Children Below 5 Years Age Group Associated with Neurological Deficits - A Tertiary Hospital-Based Prospective Study Using Otoacoustic Emissions". *Acta Scientific Otolaryngology* 2.5 (2020): 15-18.

	Male	Female
No. of patients	55	45

Table 1: Distribution of male and female.

Age	< 2 Years	> 2 and < 4 Years	> 4 Years
No. of patients	20	23	57

Table 2: Age distribution.

	No. of patients
Family history of hearing loss	6
Consanguineous marriage	13

Table 3: Number of children with family history and parental consanguineous marriage.

	Right Ear	Left Ear	Right Ear	Left Ear
Pass	90	90	96	96
Refer	10	10	4	4

Table 4: Comparison of the first and second testing.

Associated neurological deficits	No. of patients
Down's syndrome	2
Cerebral palsy	4
Microcephaly	1
Mixed cerebral palsy	2
Hemiplegia	1

Table 5: Number of children positive in the first screening.

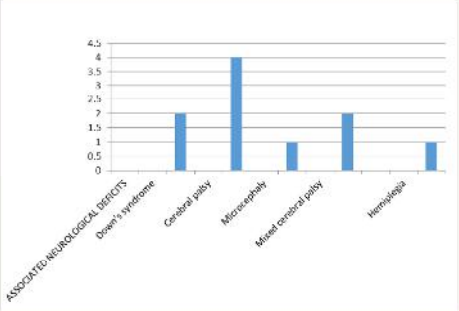


Chart 1: Number of children positive in the first screening.

identify at best about 50% of children who have a significant prelingual hearing impairment [5].

The present study was undertaken to evaluate the hearing loss among the children below 5 years of age associated with neurological deficits in tertiary care hospital, using distortion product Otoacoustic emissions in two steps.

The present study revealed that the prevalence of hearing loss is more in children associated with neurological deficit, amongst which cerebral palsy was more prevalent. In a study done by E S Marlow., *et al.* cerebral palsy was predominantly seen with significant disability [24].

The study conducted by Bolajoko O Olusanya., *et al.* In 2013 showed microcephaly children were significantly at risk of sensorineural hearing loss [18]. It has been shown that hearing loss occurs more often in children with down syndrome; In literature, the incidence ranges from 38% to 82% [17] which can be correlated with our study.

In this study male preponderance was seen which can be comparable to studies done by Rout N., *et al.* most studies reported that hearing loss is more common in male children [19,20].

In this study, the majority of the children presented late after the age of 4 years. It may be due to lack of neonatal hearing screening centers or may be due to parental ignorance and poverty, as observed in some other studies [21-23].

Conclusion

Hearing impairment with neurological deficits in preschool children is a burden to the parents, otorhinolaryngologist as well as pediatrician which leads to auditory morbidity. Our study showed a 4% prevalence in patients with neurological conditions. Otoacoustic emissions are sensitive, non-invasive, easy to perform and can be used for screening all preschool children. OAE helps in early diagnosis, management of hearing impairment and rehabilitation.

Sponsorship and Financial Support

None.

Conflict of Interest

There is no conflict of interest amongst authors.

Bibliography

1. Adegbiji Waheed., *et al.* "Preschool Children Hearing Impairment: Prevalence, Diagnosis and Management in a Developing Country". *The International Tinnitus Journal* (2018): 22.
2. Yun Chunfeng., *et al.* "Prevalence and Social Risk Factors for Hearing Impairment in Chinese Children-A National Survey". *International Journal of Environmental Research and Public Health* 14 (2017): 88.
3. Ghirri Paolo., *et al.* "Universal neonatal audiological screening: Experience of the University Hospital of Pisa". *Italian Journal of Paediatrics* (2011): 37.

Citation: TVRK Prasad., *et al.* "An Epidemiological Study of Deafness in Children Below 5 Years Age Group Associated with Neurological Deficits - A Tertiary Hospital-Based Prospective Study Using Otoacoustic Emissions". *Acta Scientific Otolaryngology* 2.5 (2020): 15-18.

4. Stoll Barbara., *et al.* "Neurodevelopmental and Growth Impairment Among Extremely Low-Birth-Weight Infants With Neonatal Infection". *JAMA: The Journal of the American Medical Association* (2004): 292.

5. Botelho Fernanda., *et al.* "Prevalence of hearing impairment in children at risk". *Brazilian Journal of Otorhinolaryngology* 76 (2010): 739-744.

6. Di Stadio., *et al.* "Sensorineural Hearing Loss in Newborns Hospitalized in Neonatal Intensive Care Unit: An Observational Study". *The International Tinnitus Journal* (2019): 23.

7. Ferber-Viart., *et al.* "Otoacoustic emissions and brainstem auditory evoked potentials in children with neurological afflictions". *Brain and Development* 16 (1994): 213-218.

8. World Health Organization. "Childhood hearing loss: strategies for prevention and care". World Health Organization (2016).

9. Kemp D. "Stimulated Acoustic Emissions From Within the Human Auditory System". *The Journal of the Acoustical Society of America* (1978): 64.

10. Siegel Jon and Kim D. "Efferent neural control of cochlear mechanics? Olivocochlear bundle stimulation affects cochlear biomechanical nonlinearity". *Hearing Research* 6 (1982): 171-82.

11. Davis A. "A critical review of the role of neonatal hearing screening in the detection of congenital hearing impairment" 1 (1997): 108-114.

12. Norton Susan., *et al.* "Identification of Neonatal Hearing Impairment: Evaluation of Transient Evoked Otoacoustic Emission, Distortion Product Otoacoustic Emission, and Auditory Brain Stem Response Test Performance". *Ear and Hearing* 21 (2000): 508-528.

13. British Society of Audiology. Practice guidance: Auditory brainstem response testing in babies (2013).

14. American Speech-Language-Hearing Association". *Auditory Brainstem Response* (ABR).

15. Rupa V. "Dilemmas in auditory assessment of developmentally retarded children using behavioural observation audiometry and brain stem evoked response audiometry". *The Journal of Laryngology and Otology* 109 (1995): 605-609.

16. Abdala C and Dhar S. "Differences in distortion product otoacoustic emission phase recorded from human neonates using two popular probes". *Journal of the Acoustical Society of America* 128 (2010b): EL49-EL55.

17. Raut P., *et al.* "High prevalence of hearing loss in Down syndrome at first year of life". *Annals, Academy of Medicine, Singapore* 40.11 (2011): 493-498.

18. Olusanya BO. "Risk of sensorineural hearing loss in infants with abnormal head size". *Annals of African Medicine* 12.2 (2013): 98-104.

19. Phillips M., *et al.* "Temporal lobe activation demonstrates sex-based differences during passive listening". *Radiology* 220.1 (2001): 202-207.

20. Cassidy J and Dity K. "Gender differences among newborns on a transient otoacoustic emissions test for hearing". *American Music Therapy* 38.1 (2001): 28-35.

21. Dunmade AD., *et al.* "Profound bilateral sensorineural hearing loss in Nigerian children: Any shift in etiology". *Journal of Deaf Studies and Deaf Education* 12.1 (2007): 112-118.

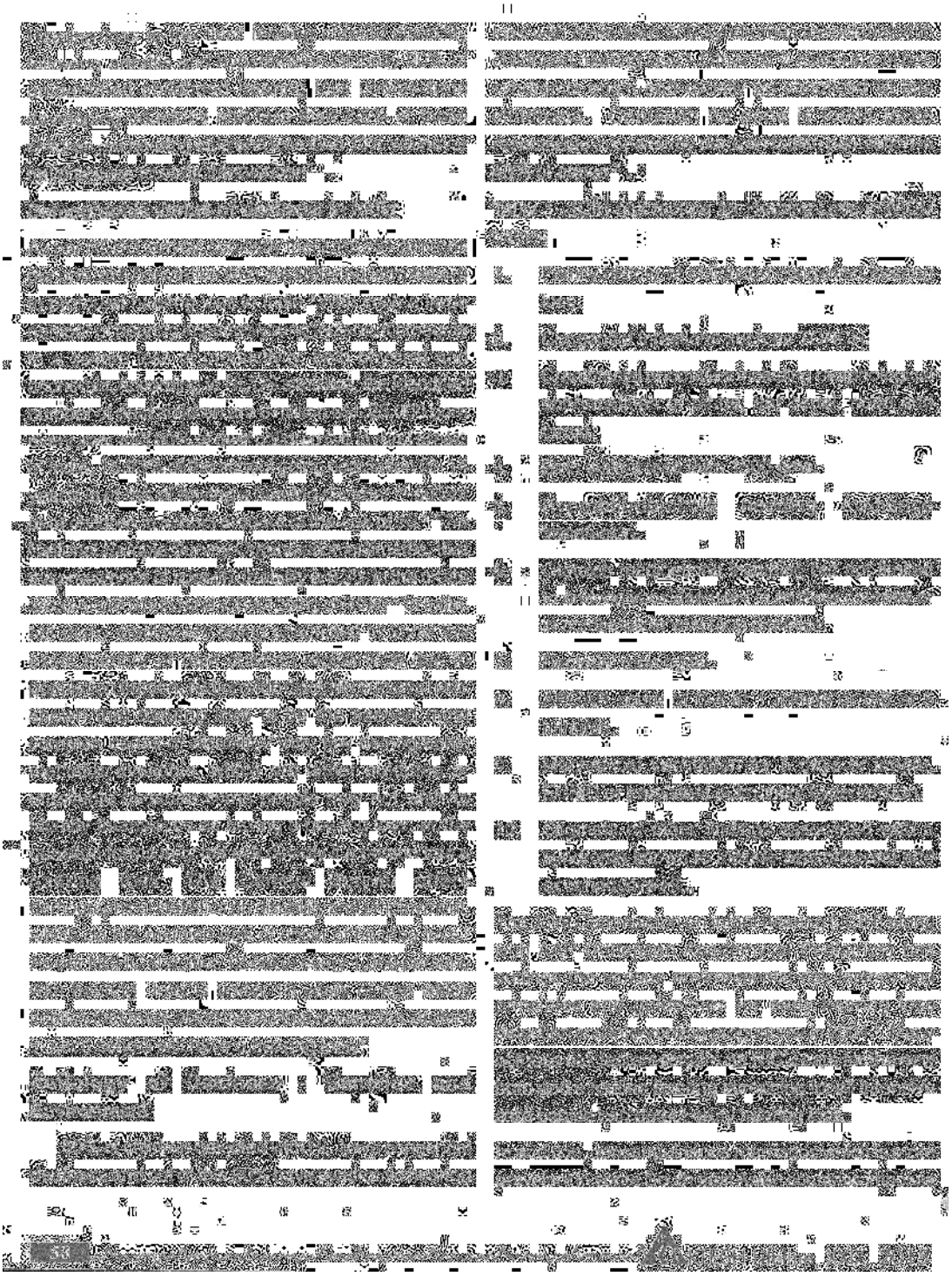
22. Ijaduola GTA. "The problems of the profoundly deaf Nigerian child. Post graduate document". *Africa* 4 (1982): 180-184.

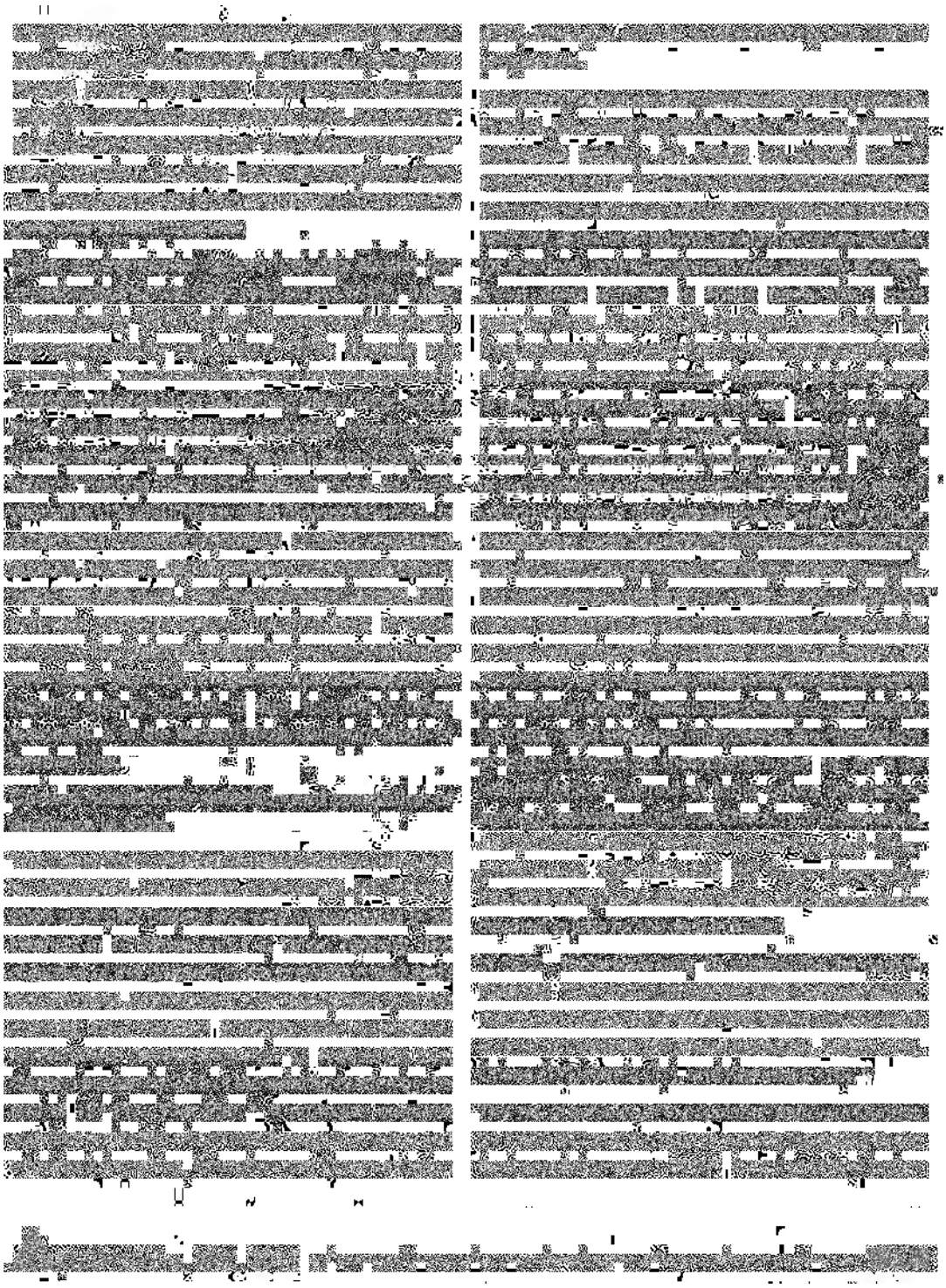
23. Isa A., *et al.* "The prevalence of meningitis induced hearing loss in North Eastern Nigeria". *Highland Medical Research Journal* 3.2 (2005): 108-115.

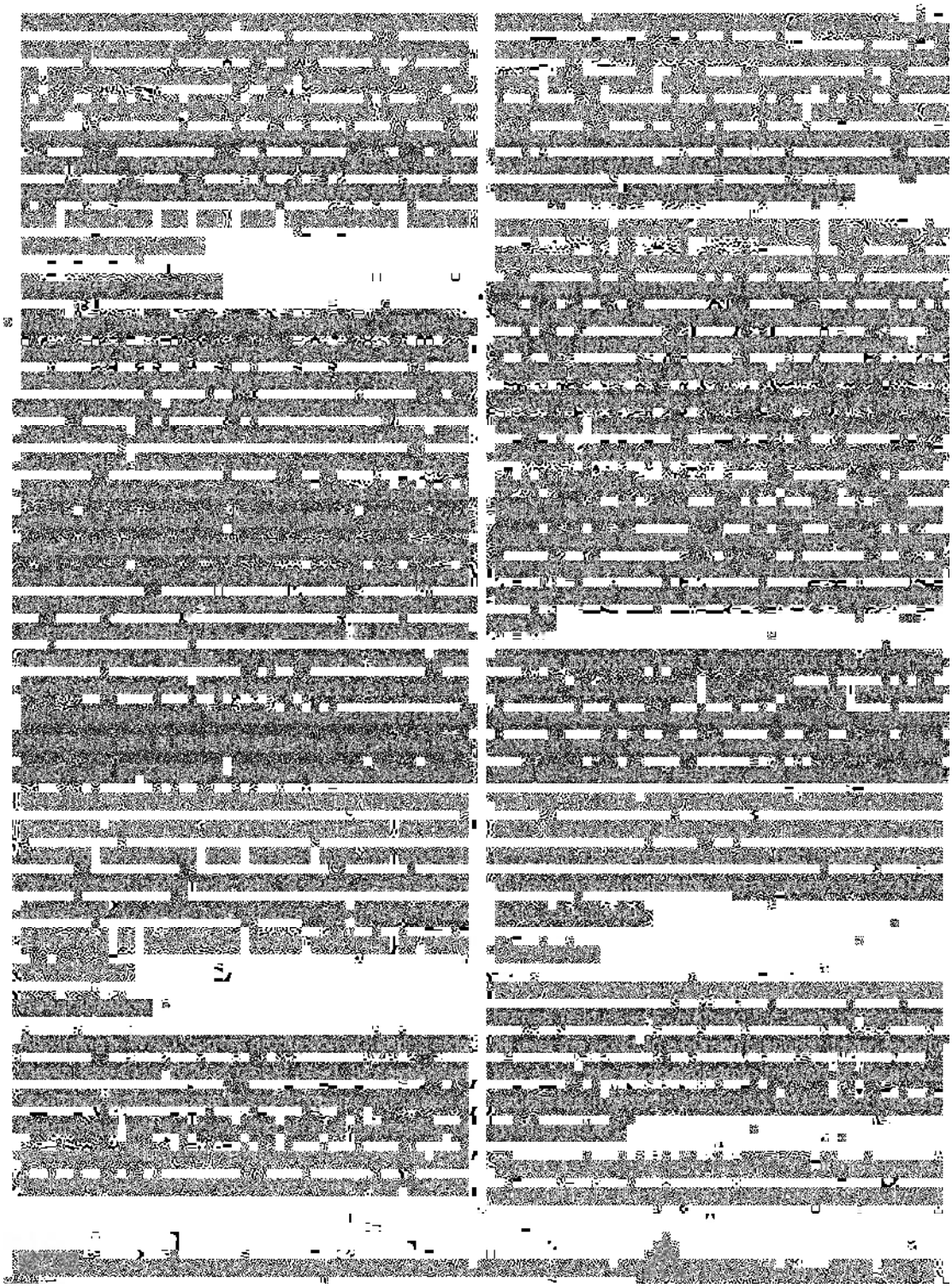
24. Marlow ES., *et al.* "Sensorineural hearing loss and prematurity". *Archives of Disease in Childhood-Fetal and Neonatal Edition* 82 (2000): F141-F144.

Citation: TVRK Prasad., *et al.* "An Epidemiological Study of Deafness in Children Below 5 Years Age Group Associated with Neurological Deficits - A Tertiary Hospital-Based Prospective Study Using Otoacoustic Emissions". *Acta Scientific Otolaryngology* 2.5 (2020): 15-18.


KLES
DR. PRABHAKAR KORE HOSPITAL
&
MEDICAL RESEARCH CENTRE
NEHRUNAGAR, BELGAUM-590010
KARNATAKA - INDIA
Lifeline
ISSN 0974-5475
JOURNAL OF KLES DR. PRABHAKAR KORE HOSPITAL & MRC
Gastroschisis associated with vitello-intestinal fistula
Redosurgeries for refistulisation after surgeries for anorectal malformation
CBD Exploration with stone extraction
Developmental anomaly of brain
Issue XXIX August 2015







the magnitude of ear problems and prevent avoidable deafness in India and partnerships with different organizations, professionals and personnel remain critical to the success of the program. It is crucial to understand factors which delay the commencement of aural habilitation in children. Alleviating the factors will help reducing the delay to an extent in a developing country like India where universal newborn hearing screening programs is yet to begin at a national level. This article attempts to convince public health expert, administrators and policy makers that Hearing loss is

References

1. World Health Organization- State of hearing and

www.searo.who.int/LinkFiles/Publications_HEARING_&_EAR_CARE.pdf

2. Suneela Garg, Shelly Chadha, Sumit Malhotra, A. K. Agarwal. Deafness: Burden, prevention and control in India. The National Medical Journal of India Vol. 22, No. 2, 2009; 79-83.

3. Ghosh M, Vijaya R, Kabra M. Genetics of

Impairment. Cited in: Rehabilitation Council ofIndia. Status of Disability in India- 2003. NewDelhi: Authors 1991; 122.

5. Census of India, 2001. Government of India Ministry of home affairs, office of registrar

6. Joint Committee on Infant Hearing. Year 2007 position statement: Principles and guidelines for early hearing detection and intervention, 2007; www.asha.org/policy on 13.09.09.

7. Tadmouri G O,Nair P, Obeid T ,Al Ali MT, Al Khaja N, Hamamy HA.Consanguity and reproductive health among Arabs.Reproductive Health 2009;6:17.

8. NPPCD-National Programme for prevention and control of deafness –Ministry of health and family

Deaf Community By Jamie Berke Updated April 28, 2009.

10. Kumar S, D'Mello J. Identifying children at-risk

Disability Journal 2006; 17: 101-108.

11. Goswami SP, Samasthitha S, Kumar S. ISHA. Directory 2010. Mysore. Indian Speech and Hearing Association

12. Nachiketa Rout, Uday Singh. Age of suspicion , identification and intervention for rural Indian children with hearing loss. Eastern Journal of Medicine 15(2010). 97-102

providing informational and adjustment counseling to families of infants and young children with hearing loss birth to 5 years of age (guidelines), 2008; www.asha.org/policy on 20.07.09.

ANNEXURE – V - CERTIFICATE OF PAPER PRESENTATION

KLE UNIVERSITY EMPOWERING PROFESSIONALS

KLE UNIVERSITY

Accredited 'A' Grade by NAAC

(Formerly known as KLE Academy of Higher Education & Research)

[Declared as Deemed-to-be-University u/s 3 of the UGC Act, 1956 vide MHRD, G.O.I. Notification No. F-9-9/2000-U-3(A)]

JNMC Campus, Nehru Nagar, Belgaum-590 010, Karnataka State, India

☎: 0831-2472777/2493779 **FAX**: 0831-2493777 **Web**: http://www.kleuniversity.edu.in **E-mail** : diracademic@kleuniversity.edu.in

Certificate of Registration

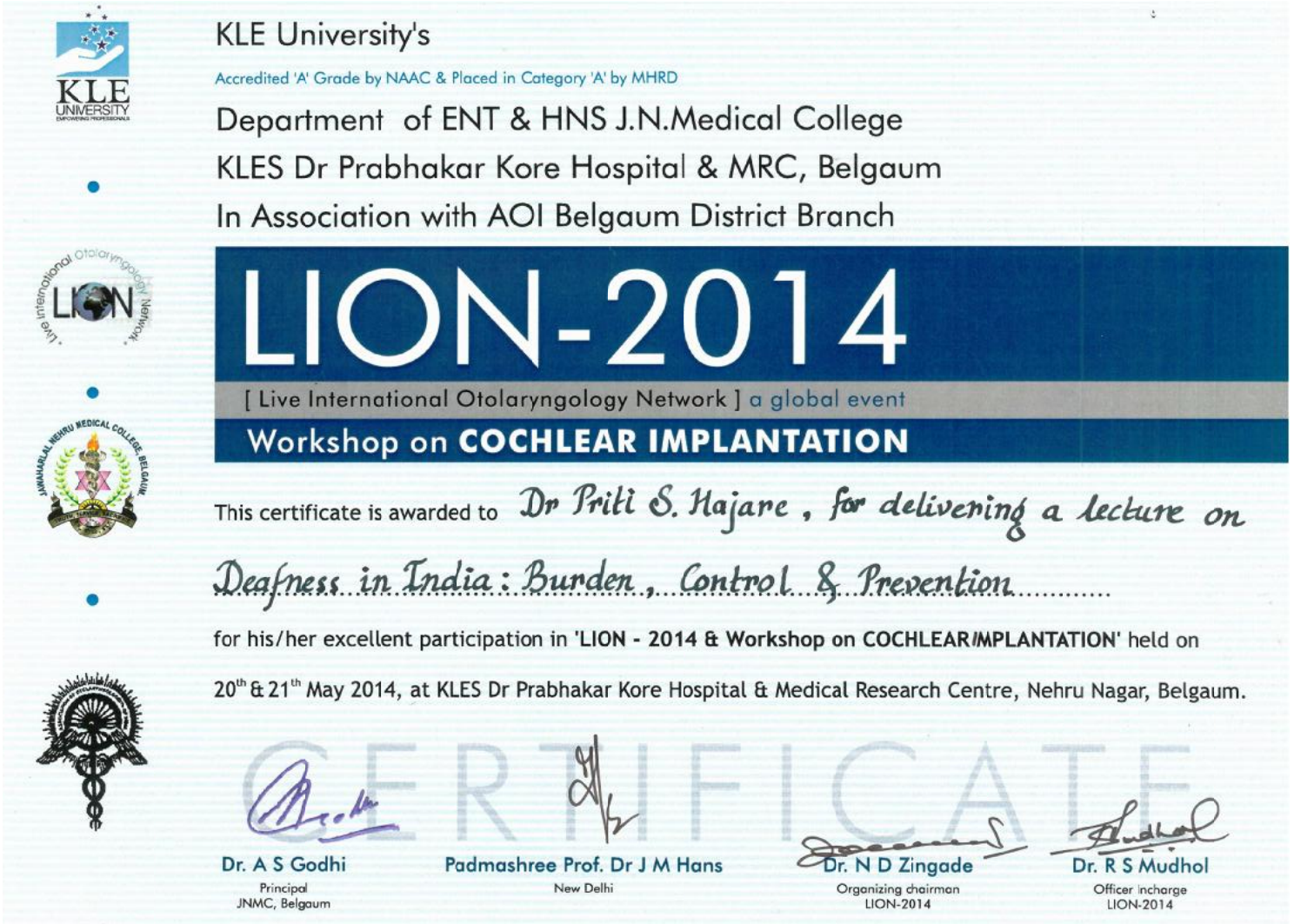
FOR THE DOCTOR OF PHILOSOPHY (Ph.D) PROGRAM

This is to certify that **Dr. Priti S. Hajare** *has been registered to the Doctor of Philosophy (Ph.D.) Program of the KLE University, Belgaum in the Faculty of Medicine during the academic year 2010-11, as per the Notification No. KLEU/Ph.D./10-11/D-11380 (A) Dated 30th August 2010*

Date: 5th October 2010

Prof. (Dr.) B. R. NILGAR
Director- Academic Affairs

Prof. (Dr.) P. F. KOTUR
Registrar



KLE University's

Accredited 'A' Grade by NAAC & Placed in Category 'A' by MHRD

Department of ENT & HNS J.N.Medical College

KLES Dr Prabhakar Kore Hospital & MRC, Belgaum

In Association with AOI Belgaum District Branch

LION-2014

[Live International Otolaryngology Network] a global event

Workshop on **COCHLEAR IMPLANTATION**

This certificate is awarded to Dr Priti S. Hajare, for delivering a lecture on

Deafness in India: Burden, Control & Prevention

for his/her excellent participation in **'LION - 2014 & Workshop on COCHLEAR IMPLANTATION'** held on

20th & 21st May 2014, at KLES Dr Prabhakar Kore Hospital & Medical Research Centre, Nehru Nagar, Belgaum.

CERTIFICATE

Dr. A S Godhi	Padmashree Prof. Dr J M Hans	Dr. N D Zingade	Dr. R S Mudhol
Principal JNMC, Belgaum	New Delhi	Organizing chairman LION-2014	Officer Incharge LION-2014

CLINIQUE JEAN CAUSSE
http://www.clinique-causse.com

Colombiers,
June 27, 2015

I hereby certify that **Dr PRITI HAJARE** presented a poster titled "**ANALYSIS OF JCIH RISK FACTORS FOR DEAFNESS IN NEWBORN – A STUDY FROM TERTIARY CARE CENTRE**" during the 17th International Otology Course from June 25 to June 27, 2015 at the Causse Ear Clinic, 3 Traverse de Béziers, 34440 Colombiers - France.

Robert VINCENT MD

CLINIQUE JEAN CAUSSE
Traverse de Béziers
34440 COLOMBIERS
Siret 340 049 105 00026

Traverse de Béziers - **34440 COLOMBIERS** (périphérie de Béziers)
Téléphone : **04 67 35 63 21** - Fax : **04 67 35 62 00**
S.A. au capital de 38.112,26 Euros / SIRET 340 049 105 00026 / APE 851 A

Association des Médecins et Chirurgiens

de la clinique Causse

Colombiers,
June 27, 2015

I hereby certify that **Dr HAJARE Priti,** from Belgaum, INDIA - was in the Causse Ear Clinic – Colombiers – France, from June 15 to June 24, 2015 to attend the Pre Course of the 17th International Otology Course, observing the surgical activities of the staff.

Robert VINCENT MD

CLINIQUE JEAN CAUSSE
Traverse de Béziers
34440 COLOMBIERS
Siret 340 049 105 00026

Association des Médecins et Chirurgiens de la Clinique Causse, Traverse de Béziers, 34440

35th AOIKCON 2017

Date : 7th, 8th, 9th & 10th September 2017 | Venue : S Nijalingappa Medical College, Bagalkot

Hosted by

Bagalkot AOI under the aegis of AOI Karnataka

CERTIFICATE OF APPRECIATION

This is to certify that

Dr. Prithi. S. Hajare

has participated in 35th AOIKCON 2017 held from 7th to 10th September 2017 at S Nijalingappa Medical College, Bagalkot and contributed a Paper / Poster titled Epidemiology of deafness in NICU babies using JCIH risk factors – a study from tertiary care centre under Dr. C.M. Gurumurthy Gold Medal for Best Teaching Faculty Paper session

Dr. Hanumantha Prasad, President, AOI Karnataka

Dr. Babu A R, Secretary, AOI Karnataka

Dr. Ashok S. Mallapur, Principal, SNMC Bagalkot

Dr. Gududur Ajay Kumar, KMC Zonal Chairman

Dr. C S Hiremath, Organizing Secretary, AOI Karnataka

Dr. S S Suligavi, Joint Org. Secretary, AOI Karnataka

Dr. Kiran Kalburgi, President, AOI Bagalkot

Dr. S S Doddamani, Organizing Chairman, AOI Karnataka

3 C's

Asia Oceania Association of Oto-Rhino-Laryngological Society

14th Asia-Oceania 2019 ORL-HNS Congress &
71st Annual Conference of The Association of Otolaryngologists of India
Future of ENT and Head-Neck Surgery
9th-13th January, 2019 • Hyderabad, INDIA

Organised by:
The Association of Otolaryngologists of India & AOI - HYDERABAD BRANCH

Certificate

We have great pleasure in awarding this certificate to

DR. PRITI HAJARE

For participation in

SENIOR CONSULTANT PAPER

STUDY OF DEAFNESS IN NICU BABIES USING JCIH RISK FACTORS

Dr Sheng-Po Hao President	Dr Sudhakar Vaidya Organising Chairman	Dr Ravi Ramlingam President - AOI	Dr Sanjay Agrawal Scientific Chairman

Dr Viral Chhaya Secretary General	Dr S P Dubey President Elect - AOI	Dr Kaushal Sheth Secretary - AOI	Dr D Dwarakanatha Reddy Convener	Dr N Venkatram Reddy Organising Secretary

36th Annual Karnataka State Conference of Association of Otolaryngologists of India & **14th South Zone ENT CONFERENCE 2018** – MIMS, Mandya

AOI SOUTH KCON 2018 MANDYA

Certificate

This is to certify that Dr. Priti S. Hajare

has participated in Paper Presentation

and presented paper/video/e-poster titled Screening for Deafness - challenges & solutions

at ***36th Annual Karnataka State and 14th South Zone ENT Conference held from***

11th – 14th October 2018 at MIMS, Mandya, Karnataka.

Dr A M Shivkumar	Dr Jyothiswarup	Dr M Hanumanth Prasad	Dr Ravi.D	Dr Shankar Medikeri
AOI Karnataka State President	AOI Karnataka Secretory	Organising Chairman	Organising Secretary	Scientific Committee Chairman

CME on Otology and Basic and Advanced Temporal Bone Dissection 2020

Organized by

Department of ENT, Head and Neck Surgery

Jawaharlal Nehru Medical College and

KLE Academy of Higher Education & Research, Belagavi

Certificate

This is to certify that

Dr. Priti S Hajare Reg no. KMC 70352

delivered a Lecture on

NEWBORN HEARING SCREENING- NEED OF THE HOUR in the CME on Otology and Basic &

Advanced Temporal Bone Dissection 2020

held from 16-17th December 2020 at Department of ENT & HNS, Jawaharlal Nehru Medical College, Belagavi.

Dr. A. S. Harugop

Organising Chairman

Prof. & HOD,

Dept. of ENT & HNS, J. N. Medical College, Belagavi

SR.NO	Age	SEX	OP/IP NUMBER	EDUCATION	CONSANGUOS MARRIAGE	ANC	FAMILY H/O DEAFNESS	MODE OF DELIVERY	TORCH INFECTION	MEDICATION	GESTATIONAL AGE IN WKS	BIRTH WEIGHT GMS	APGAR SCORE	CRANIOFACIAL ANOMALY	HYPERBILLIRUBINEMIA	NEUROLOGICAL FACTORS	INFECTION	AMINO. INJ	MECH VENTI	TOTAL DAYS I NICU	ASSO. SYND	6000R	6000L	4000R	4000L	3000R	3000L	2000R	2000L	FINAL RESULT
1																						RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	
2	22	F	665452	I	NO	A	NO	N	YES	YES	37	2000	3	NO	13	NO	NO	NIL	YES	20	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
3	14	M	653243	H	NO	A	NO	N	NO	NO	28	1900	4	NO	10	YES	YES	Y	YES	22	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	REFER	PASS
4	26	M	662195	H	YES	N	NO	A	NO	NO	32	2100	3	NO	14	NO	YES	Y	N	12	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS
5	23	M	633433	G	NO	A	NO	N	NO	NO	35	2000	5	NO	5	NO	NO	NIL	N	7	NO	PASS	PASS	PASS	PASS	REFER	PASS	REFER	PASS	PASS
6	30	F	626153	G	NO	N	NO	N	NO	NO	35	2100	3	NO	6	NO	NO	NIL	N	7	NO	REFER	REFER	PASS	REFER	PASS	REFER	PASS	PASS	PASS
7	7	M	611677	H	NO	N	NO	N	NO	NO	36	2400	4	NO	4	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
8	6	F	652670	G	NO	A	NO	L	NO	NO	34	1900	5	NO	10	I	YES	Y	YES	14	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
9	5	M	658790	G	NO	A	NO	N	NO	NO	36	1700	4	NO	9	NO	NO	NIL	N	5	NO	PASS	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS
10	5	F	634728	H	NO	N	NO	N	NO	NO	36	2500	4	NO	6	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS
11	11	M	633005	H	NO	HT,A	NO	A	NO	NO	29	1500	3	NO	7	NO	YES	Y	YES	10	NO	REFER	REFER	REFER	REFER	PASS	PASS	REFER	REFER	REFER
12	4	M	634360	H	NO	N	NO	N	NO	NO	35	2000	4	NO	4	NO	NO	NIL	N	4	NO	PASS	REFER	PASS	REFER	PASS	REFER	PASS	PASS	PASS
13	4	F	634360	H	NO	A	NO	A	NO	NO	37	2100	3	NO	4	NO	NO	NIL	N	3	NO	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS
14	1	M	634632	H	YES	N	NO	N	NO	NO	38	2500	4	NO	3	NO	NO	NIL	N	3	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
15	20	M	650615	H	NO	N	NO	A	NO	NO	32	2000	5	NO	11	I	YES	Y	YES	14	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	PASS	REFER
16	5	F	653794	G	YES	A	NO	L	NO	NO	36	1800	4	NO	6	NO	YES	Y	N	6	NO	PASS	PASS	PASS	PASS	NOISY	PASS	REFER	REFER	PASS
17	7	F	653475	H	YES	A	NO	N	NO	NO	32	1600	3	NO	9	NO	YES	Y	N	13	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
18	44	M	648783	G	NO	HT	NO	A	NO	YES	35	2000	4	NO	4	NO	NO	NIL	YES	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
19	30	F	648658	H	NO	A	NO	N	NO	YES	28	1400	3	NO	12	NO	YES	Y	YES	38	YES	REFER	REFER	REFER	PASS	REFER	PASS	REFER	PASS	PASS
20	15	F	651930	H	YES	A	NO	N	NO	YES	32	1900	3	NO	8	NO	YES	Y	N	20	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	REFER	PASS
21	9	F	641546	H	NO	N	NO	L	NO	YES	38	2600	4	NO	5	NO	NO	NIL	N	10	NO	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS	PASS
22	4	F	611925	H	YES	A	NO	N	NO	NO	36	1900	4	NO	9	NO	YES	Y	N	16	NO	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS	PASS
23	8	M	650652	H	YES	A	NO	L	NO	NO	36	2000	3	NO	7	NO	YES	Y	N	10	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	REFER	PASS
24	14	F	649131	H	NO	A	NO	L	NO	NO	34	2100	4	NO	5	NO	NO	NIL	N	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
25	7	M	650891	G	NO	N	NO	A	NO	NO	36	2150	3	NO	3	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
26	3	M	651557	H	YES	A	NO	L	NO	NO	37	2300	4	NO	4	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
27	8	F	645579	G	NO	A	NO	L	NO	NO	38	2200	4	NO	4	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	NOISY	PASS
28	8	M	645719	G	NO	A	NO	A	NO	NO	34	2100	3	NO	7	I	YES	Y	N	10	NO	REFER	PASS	PASS	PASS	PASS	PASS	REFER	NOISY	PASS
29	11	F	655683	G	NO	A	NO	N	NO	NO	29	1800	5	NO	3	NO	YES	NIL	N	11	NO	PASS	PASS	PASS	REFER	PASS	PASS	REFER	NOISY	PASS
30	8	F	645485	G	YES	A	NO	L	NO	NO	36	2000	4	NO	4	NO	NO	NIL	N	6	NO	PASS	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER
31	8	F	645483	G	NO	A	NO	N	NO	NO	34	1900	3	NO	12	YES	YES	Y	YES	12	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	REFER	PASS
32	27	F	652497	H	NO	A	NO	A	NO	YES	28	2000	5	NO	6	NO	YES	Y	YES	18	NO	REFER	PASS	REFER	PASS	REFER	PASS	PASS	PASS	PASS
33	8	M	652091	G	YES	N	NO	A	NO	NO	34	2000	3	NO	3	NO	NO	NIL	N	2	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
34	7	M	628582	H	NO	A	NO	N	NO	NO	37	2100	4	NO	3	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	REFER	PASS	REFER	REFER	PASS
35	11	M	654342	H	NO	A	YES	N	NO	NO	31	1700	3	NO	6	NO	NO	NIL	N	8	NO	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
36	5	F	654590	H	YES	N	NO	L	NO	NO	40	2800	2	NO	2	NO	NO	NIL	N	2	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
37	2	F	629620	G	NO	A	NO	N	NO	NO	30	1700	4	NO	5	NO	NO	NIL	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	REFER	PASS
38	6	M	628671	G	NO	N	NO	N	NO	NO	37	2100	3	NO	7	I	NO	NIL	N	7	NO	PASS	PASS	PASS	PASS	REFER	PASS	REFER	REFER	PASS
39	19	F	635277	G	NO	A	NO	N	NO	NO	33	1900	3	NO	10	NO	YES	Y	YES	10	NO	REFER	PASS	REFER	REFER	PASS	REFER	REFER	PASS	REFER
40	15	M	611928	G	YES	N	YES	A	NO	NO	35	2200	4	NO	8	NO	NO	NIL	N	6	NO	REFER	PASS	REFER	REFER	PASS	REFER	REFER	REFER	REFER
41	30	M	643270	G	NO	N	NO	L	NO	YES	36	2100	6	NO	5	NO	YES	Y	YES	16	NO	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER	REFER
42	17	M	652484	G	NO	HT	NO	N	NO	NO	33	1900	6	NO	13	YES	YES	Y	N	9	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
43	21	F	649053	G	YES	A	NO	N	NO	NO	28	1700	4	NO	10	YES	YES	Y	YES	16	NO	PASS	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS
44	9	F	641548	G	NO	PR	NO	A	NO	NO	28	1800	7	NO	14	NO		NIL	N	14	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
45	3	F	642460	G	YES	I	NO	N	NO	NO	28	1100	3	NO	5	NO	NO	Y	N	20	NO	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS

SR.NO	Age	SEX	OP/IP NUMBER	EDUCATION	CONSANGUOS MARRIAGE	ANC	FAMILY H/O DEAFNESS	MODE OF DELIVERY	TORCH INFECTION	MEDICATION	GESTATIONAL AGE IN WKS	BIRTH WEIGHT GMS	APGAR SCORE	CRANIOFACIAL ANOMALY	HYPERBILLIRUBINEMIA	NEUROLOGICAL FACTORS	INFECTION	AMINO. INJ	MECH VENTI	TOTAL DAYS I NICU	ASSO. SYND	6000R	6000L	4000R	4000L	3000R	3000L	2000R	2000L	FINAL RESULT
46	6	M	654097	H	YES	A	NO	A	NO	NO	32	1800	7	NO	6	YES	YES	YES	YES	22	NO	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
47	8	M	632421	H	NO	A	NO	N	NO	NO	25	1400	6	Y	4	NO	YES	NIL	N	12	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
48	14	F	634221	H	NO	A	NO	A	NO	NO	30	2300	8	NO	10	YES	NO	NIL	N	7	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS
49	4	M	645345	H	NO	I	NO	N	NO	NO	28	1650	6	NO	9	YES	NO	NIL	N	7	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
50	20	M	625923	H		HT,A	NO	N	NO	NO	25	1100	6	NO	6	NO	NO	Y	YES	4	NO	REFER	REFER	REFER	REFER	REFER	PASS	PASS	PASS	REFER
51	5	M	628879	H	NO	A	NO	A	NO	YES	29	1600	7	NO	7	YES	YES	NIL	N	14	NO	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
52	5	M	628712	H		A	NO	N	NO	YES	28	1300	7	NO	4	YES	NO	NIL	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
53	8	F	628423	H	NO	A	NO	N	NO	NO	26	1400	7	NO	4	NO	NO	Y	YES	12	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
54	1	F	654297	G	YES	N	NO	L	NO	NO	31	2000	8	NO	3	NO	YES	NIL	N	10	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
55	15	M	628566	G	NO	N	NO	L	NO	NO	34	2900	8	NO	11	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	REFER	PASS
56	16	M	627027	G	NO	A	NO	N	NO	NO	29	1400	8	NO	6	NO	NO	NIL	N	3	NO	PASS	PASS	PASS	PASS	PASS	REFER	REFER	REFER	PASS
57	13	M	650014	G	NO	A	NO	A	NO	NO	24	1100	4	NO	9	NO	NO	Y	YES	3	NO	REFER	PASS	REFER	PASS	REFER	PASS	REFER	PASS	PASS
58	9	M	650920	G	NO	A	NO	A	NO	NO	28	1600	4	NO	4	NO	YES	Y	YES	14	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
59	7	F	651961	G	NO	N	NO	N	NO	YES	28	1900	5	NO	12	NO	YES	Y	YES	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
60	4	F	643521	H	NO	HT,A	NO	N	NO	NO	29	1500	7	NO	8	YES	YES	NIL	N	13	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
61	25	M	638560	G	YES	A	NO	N	NO	NO	29	1600	3	NO	5	NO	NO	Y	YES	7	NO	PASS	REFER	PASS	REFER	PASS	PASS	REFER	REFER	PASS
62	4	M	642291	H	NO	I	NO	N	NO	NO	34	1800	4	NO	9	NO	YES	Y	YES	38	NO	REFER	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
63	5	M	643386	G	NO	HT,A	NO	A	NO	NO	28	1400	4	NO	7	NO	YES	NIL	N	20	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
64	16	F	635397	H	YES	A	NO	A	NO	NO	26	1750	4	NO	5	NO	NO	Y	YES	10	NO	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
65	13	M	640804	H	NO	N	NO	L	NO	NO	37	2900	4	NO	3	NO	YES	Y	YES	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
66	28	F	643877	H	NO	A	NO	N	NO	NO	24	1000	5	NO	4	NO	YES	NIL	N	10	NO	PASS	PASS	PASS	REFER	PASS	REFER	PASS	PASS	PASS
67	10	M	659860	H	NO	A	NO	L	NO	NO	31	2000	7	NO	4	NO	NO	NIL	N	6	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
68	6	F	639954	G	NO	A	NO	A	NO	NO	30	1500	7	NO	7	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	NOISY	REFER	PASS	PASS
69	3	F	643635	G	YES	N	NO	N	NO	NO	29	1700	4	NO	3	YES	NO	NIL	N	4	NO	PASS	PASS	REFER	PASS	PASS	REFER	PASS	REFER	PASS
70	11	M	642421	G	NO	I	NO	L	NO	NO	39	2900	6	NO	4	YES	NO	Y	YES	4	NO	PASS	PASS	REFER	PASS	REFER	REFER	PASS	PASS	PASS
71	1	M	642772	G	YES	N	NO	N	NO	NO	30	1800	4	NO	12	NO	YES	NIL	YES	10	YES	REFER	REFER	REFER	REFER	REFER	REFER	NOISY	REFER	REFER
72	13	F	640715	G	YES	A	NO	N	NO	YES	28	1500	6	NO	6	NO	YES	NIL	N	11	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
73	17	M	648791	G	YES	A	NO	L	NO	NO	29	2200	7	NO	3	YES	NO	Y	YES	6	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
74	3	F	658578	G	NO	HT	NO	A	NO	NO	28	1890	7	NO	3	NO	YES	Y	YES	12	NO	REFER	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
75	6	F	657954	G	NO	A	NO	N	NO	NO	27	1600	7	NO	6	NO	YES	NIL	N	18	NO	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
76	8	M	657692	G	NO	N	NO	N	NO	NO	28	1800	6	NO	2	NO	NO	NIL	N	2	NO	REFER	PASS	REFER	PASS	REFER	PASS	REFER	PASS	PASS
77	8	F	656626	G	NO	A	NO	N	NO	NO	30	1900	5	NO	5	YES	NO	NIL	N	4	NO	REFER	PASS	REFER	REFER	REFER	REFER	REFER	PASS	REFER
78	7	F	656698	G	NO	A	NO	L	NO	NO	24	1350	5	NO	7	YES	NO	YES	N	8	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
79	7	F	656700	H	YES	N	NO	N	NO	NO	32	1800	6	NO	10	NO	NO	YES	N	8	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
80	3	F	657509	H	NO	A	NO	N	NO	NO	28	1700	6	NO	8	NO	NO	N	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
81	20	M	657148	H	NO	A	NO	A	NO	YES	32	1600	6	NO	5	NO	NO	N	YES	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
82	2	F	644266	H	NO	A	NO	L	NO	NO	35	2100	8	NO	9	YES	YES	N	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
83	5	M	654813	G	NO	A	NO	N	NO	NO	35	1700	7	NO	11	NO	NO	YES	YES	6	NO	PASS	REFER	PASS	REFER	REFER	REFER	REFER	PASS	REFER
84	5	F	645850	G	NO	N	NO	L	NO	NO	36	2700	3	NO	5	NO	YES	N	YES	16	NO	PASS	PASS	PASS	REFER	REFER	REFER	PASS	PASS	PASS
85	5	F	645848	G	YES	A	NO	N	NO	NO	34	1450	4	NO	9	NO	YES	N	YES	9	NO	PASS	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
86	1	M	654987	G	NO	N	NO	N	NO	NO	36	1750	4	NO	7	NO	YES	YES	N	16	NO	REFER	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
87	16	M	622345	G	NO	A	NO	L	NO	NO	36	3000	6	NO	5	NO		N	YES	9	NO	PASS	REFER	PASS	REFER	PASS	REFER	PASS	REFER	PASS
88	20	M	623415	G	NO	A	NO	L	NO	NO	29	1500	5	NO	3	NO	NO	N	YES	16	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	REFER	PASS
89	18	M	688954	G	NO	PR	NO	L	NO	YES	35	2000	5	NO	4	NO	YES	N	N	6	NO	PASS	REFER	PASS	REFER	PASS	REFER	REFER	REFER	REFER
90	8	F	675556	H	NO	N	NO	N	YES	NO	37	2100	6	NO	4	NO	YES	YES	YES	12	NO	REFER	REFER	REFER	REFER	PASS	PASS	REFER	REFER	REFER

SR.NO	Age	SEX	OP/IP NUMBER	EDUCATION	CONSANGUOS MARRIAGE	ANC	FAMILY H/O DEAFNESS	MODE OF DELIVERY	TORCH INFECTION	MEDICATION	GESTATIONAL AGE IN WKS	BIRTH WEIGHT GMS	APGAR SCORE	CRANIOFACIAL ANOMALY	HYPERBILLIRUBINEMIA	NEUROLOGICAL FACTORS	INFECTION	AMINO. INJ	MECH VENTI	TOTAL DAYS I NICU	ASSO. SYND	6000R	6000L	4000R	4000L	3000R	3000L	2000R	2000L	FINAL RESULT
91	10	F	666875	H	YES	N	NO	L	NO	NO	38	2800	4	NO	7	NO	NO	YES	YES	18	NO	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
92	1	M	677890	H	NO	A	NO	N	NO	NO	32	1100	3	NO	3	NO	NO	YES	N	2	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS
93	2	F	688754	G	NO	A	NO	A	NO	NO	36	1750	7	NO	4	NO	NO	N	N	4	NO	PASS	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS
94	3	M	685594	G	NO	A	YES	N	NO	NO	32	1800	7	NO	12	NO	YES	YES	N	8	NO	REFER	REFER	REFER	REFER	PASS	REFER	PASS	PASS	REFER
95	11	M	653410	G	NO	N	NO	L	NO	NO	35	2900	3	NO	6	NO	NO	YES	N	2	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
96	10	M	675993	G	YES	A	NO	N	NO	NO	28	1400	3	NO	3	NO	NO	N	YES	5	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
97	9	F	675502	G	NO	A	NO	N	NO	NO	32	1900	8	NO	3	NO	YES	YES	YES	7	NO	PASS	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS
98	33	M	670043	G	NO	A	NO	L	NO	NO	38	2880	8	NO	6	NO	NO	YES	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS
99	9	F	679900	G	NO	HT	NO	L	NO	NO	36	2600	7	NO	2	NO	NO	N	YES	6	NO	REFER	REFER	REFER	REFER	PASS	PASS	PASS	PASS	PASS
100	9	M	678543	G	YES	A	NO	A	NO	NO	32	1650	7	NO	5	YES	NO	N	YES	16	NO	PASS	REFER	PASS	REFER	PASS	REFER	PASS	PASS	REFER
101	12	F	681111	G	NO	A	NO	N	NO	NO	34	1800	7	NO	7	NO	YES	N	N	9	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
102	10	M	678221	G	YES	A	NO	L	NO	NO	36	3300	3	NO	10	NO	YES	N	N	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
103	6	M	674532	G	NO	N	NO	L	NO	NO	37	2800	9	NO	8	NO	YES	YES	N	6	NO	REFER	REFER	REFER	REFER	REFER	PASS	REFER	PASS	REFER
104	2	F	674439	G	NO	A	NO	L	NO	NO	38	3200	9	NO	5	NO	NO	YES	N	3	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
105	6	M	680001	G	NO	N	NO	N	NO	NO	34	2300	4	NO	9	NO	YES	N	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
106	6	M	680051	H	NO	A	NO	N	NO	NO	29	1300	8	NO	11	NO	YES	YES	N	11	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
107	9	F	680012	H	NO	A	NO	L	NO	NO	36	3000	3	NO	2	NO	NO	YES	YES	3	NO	REFER	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
108	5	F	680031	H	NO	N	NO	L	NO	YES	34	2200	2	NO	5	NO	YES	N	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
109	4	M	680013	H	NO	A	NO	N	NO	NO	30	1800	8	NO	7	NO	YES	N	YES	7	NO	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
110	6	F	684432	H	YES	N	NO	N	NO	NO	34	2500	6	NO	10	NO	NO	N	YES	2	NO	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS	PASS
111	5	F	679990	H	NO	N	NO	L	NO	NO	37	2200	6	NO	8	NO	NO	N	YES	6	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
112	8	F	688001	H	NO	HT,A	NO	N	NO	NO	31	1200	6	NO	5	NO	NO	N	N	9	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
113	9	F	687990	G	NO	N	NO	L	NO	NO	40	3200	6	NO	9	NO	NO	N	YES	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
114	2	M	680015	G	NO	A	NO	L	NO	YES	30	1900	6	NO	11	NO	YES	YES	YES	11	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
115	11	F	680022	G	NO	N	NO	A	NO	NO	37	2000	6	YES	7	NO	YES	N	N	22	NO	REFER	REFER	PASS	REFER	REFER	REFER	REFER	PASS	REFER
116	M	M	680026	G	NO	HT	NO	A	NO	NO	33	2300	8	NO	5	NO	NO	YES	N	3	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
117	22	M	680044	G	NO	N	NO	L	NO	NO	35	2300	7	NO	10	NO	YES	YES	N	3	NO	PASS	PASS	PASS	REFER	PASS	PASS	REFER	PASS	PASS
118	8	F	680078	G	NO	N	NO	L	NO	NO	36	2800	7	NO	14	NO	YES	YES	N	6	NO	PASS	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER
119	9	M	680098	G	NO	A	NO	N	YES	NO	33	1100	3	NO	5	NO	NO	Y	YES	7	NO	PASS	PASS	PASS	PASS	PASS	REFER	NOISY	NOISY	PASS
120	3	F	680102	G	NO	N	NO	L	NO	NO	28	2400	8	NO	6	NO	NO	Y	N	20	NO	REFER	PASS	REFER	PASS	REFER	PASS	REFER	REFER	REFER
121	5	F	681004	H	NO	A	NO	N	NO	NO	28	1200	3	NO	4	YES	NO	NIL	N	22	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
122	8	F	681110	H	YES	N	NO	N	NO	NO	28	1900	7	NO	10	NO	NO	NIL	YES	12	NO	PASS	PASS	PASS	REFER	REFER	PASS	REFER	PASS	PASS
123	2	F	681120	H	YES	N	NO	N	NO	NO	32	2000	8	NO	9	NO	NO	NIL	N	7	NO	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS
124	5	M	681178	H	NO	N	NO	N	NO	NO	25	2100	9	NO	6	NO	NO	NIL	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
125	9	M	681167	H	YES	A	NO	N	NO	NO	30	1150	4	NO	7	NO	YES	NIL	N	4	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
126	3	M	681132	H	NO	A	NO	L	NO	YES	28	1500	3	NO	4	NO	NO	NIL	YES	14	NO	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS
127	5	F	681122	H	NO	HT	NO	N	NO	NO	25	1450	3	NO	4	NO	YES	Y	N	5	NO	REFER	PASS	REFER	REFER	PASS	REFER	REFER	PASS	REFER
128	6	F	675480	H	NO	N	NO	N	NO	NO	29	1800	8	NO	3	NO	YES	NIL	N	4	NO	REFER	PASS	REFER	REFER	PASS	REFER	REFER	REFER	REFER
129	6	M	691123	H	NO	A	NO	N	NO	NO	28	1500	7	NO	11	NO	YES	Y	YES	10	NO	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER	REFER
130	3	F	689999	H	NO	A	NO	A	NO	NO	26	1600	8	NO	6	NO	NO	Y	YES	4	NO	PASS	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
131	2	M	668890	G	NO	N	NO	N	NO	NO	31	1700	7	NO	9	NO	NO	Y	N	3	NO	PASS	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS
132	4	M	699870	G	NO	N	NO	A	NO	NO	34	2000	3	NO	4	NO	YES	NIL	N	3	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
133	6	M	678122	G	NO	A	NO	N	NO	YES	29	1200	3	NO	12	NO	YES	Y	N	14	NO	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
134	12	F	677894	G	NO	A	NO	N	NO	NO	34	2060	7	YES	8	NO	NO	YES	N	6	NO	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
135	20	F	690011	G	NO	A	YES	N	NO	NO	31	1700	7	NO	5	NO	NO	NIL	N	13	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	NOISY	REFER

SR.NO	Age	SEX	OP/IP NUMBER	EDUCATION	CONSANGUOS MARRIAGE	ANC	FAMILY H/O DEAFNESS	MODE OF DELIVERY	TORCH INFECTION	MEDICATION	GESTATIONAL AGE IN WKS	BIRTH WEIGHT GMS	APGAR SCORE	CRANIOFACIAL ANOMALY	HYPERBILLIRUBINEMIA	NEUROLOGICAL FACTORS	INFECTION	AMINO. INJ	MECH VENTI	TOTAL DAYS I NICU	ASSO. SYND	6000R	6000L	4000R	4000L	3000R	3000L	2000R	2000L	FINAL RESULT
136	6	F	690032	G	YES	A	NO	N	NO	YES	28	1550	6	NO	9	NO	NO	NIL	N	7	NO	REFER	NOISY	REFER	REFER	REFER	REFER	REFER	REFER	REFER
137	7	M	689008	H	NO	A	NO	N	NO	NO	29	2150	6	NO	7	NO	YES	NIL	N	38	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
138	3	M	689536	H	NO	N	NO	L	NO	NO	36	1900	6	NO	5	NO	NO	Y	N	20	NO	REFER	REFER	REFER	REFER	REFER	PASS	PASS	PASS	REFER
139	4	F	689364	H	NO	A	NO	N	NO	NO	26	1500	5	NO	3	NO	NO	NIL	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
140	9	M	690133	G	NO	HT,A	NO	L	NO	NO	28	1200	7	NO	4	NO	YES	NIL	N	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
141	5	M	689947	G	NO	N	NO	A	NO	YES	38	3300	4	NO	4	NO	NO	Y	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
142	11	M	689904	G	NO	A	NO	L	NO	NO	35	2000	7	NO	7	NO	NO	NIL	YES	6	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	PASS
143	6	M	698701	G	NO	A	NO	N	NO	NO	24	1400	6	NO	3	YES	NO	NIL	YES	12	NO	REFER	PASS	PASS	REFER	REFER	REFER	REFER	PASS	PASS
144	7	F	690133	G	NO	N	NO	N	NO	NO	31	1900	6		4	NO	YES	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	REFER	PASS
145	10	F	690566	G	NO	A	NO	N	NO	NO	30	1600	5	NO	12	NO	YES	Y	N	4	NO	REFER	PASS	REFER	PASS	REFER	REFER	REFER	PASS	REFER
146	8	M	688897	G	NO	N	NO	L	NO	NO	33	1800	7	NO	6	NO	YES	Y	N	10	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
147	7	M	688890	I	YES	A	NO	L	NO	NO	29	2000	8	NO	3	NO	NO	Y	N	11	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
148	5	M	690001	G	YES	A	NO	N	NO	NO	30	2300	8	NO	3	NO	YES	NIL	N	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
149	9	M	690078	G	NO	A	NO	N	NO	NO	28	1700	7	NO	6	NO	YES	Y	N	12	NO	PASS	REFER	PASS	REFER	REFER	REFER	REFER	REFER	REFER
150	5	F	690073	G	NO	A	NO	A	NO	NO	29	1800	9	NO	2	NO	NO	Y	YES	18	NO	REFER	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
151	9	F	690021	H	NO	A	NO	N	NO	YES	32	1800	3	NO	5	NO	YES	NIL	N	2	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
152	6	M	677775	H	NO	N	NO	N	NO	NO	35	2400	3	NO	7	NO	YES	NIL	YES	4	NO	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
153	4	M	683635	G	NO	N	NO	N	NO	NO	35	2300	6	NO	10	NO	NO	Y	N	8	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
154	11	M	680676	G	YES	A	NO	N	NO	NO	37	2800	5	NO	8	NO	NO	Y	YES	2	NO	REFER	PASS	REFER	REFER	PASS	REFER	REFER	PASS	REFER
155	6	F	688940	G	NO	A	NO	N	NO	NO	24	1400	5	NO	5	NO	NO	Y	N	5	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS
156	7	M	689009	G	NO	I	NO	N	NO	NO	32	2000	8	NO	12	NO	NO	NIL	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS	PASS
157	9	F	686879	G	NO	A	NO	A	NO	NO	28	1600	5	NO	10	NO	YES	Y	YES	10	NO	PASS	PASS	REFER	PASS	REFER	PASS	PASS	REFER	PASS
158	17	M	698014	G	NO	N	NO	N	NO	NO	32	1800	6	NO	14	NO	YES	Y	N	6	NO	PASS	PASS	REFER	PASS	REFER	REFER	PASS	PASS	REFER
159	12	F	691122	G	NO	A	NO	N	NO	NO	35	2600	2	NO	5	NO	NO	NIL	N	16	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
160	17	F	691163	H	YES	N	NO	N	NO	NO	35	2500	3	NO	6	NO	YES	Y	N	9	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
161	12	M	690023	H	NO	A	NO	N	NO	NO	36	2900	5	NO	4	NO	YES	Y	YES	16	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
162	9	M	691112	H	NO	N	NO	N	NO	NO	34	2500	8	NO	10	NO	NO	Y	N	9	NO	REFER	REFER	REFER	PASS	PASS	PASS	REFER	REFER	REFER
163	8	F	609334	H	NO	A	NO	N	NO	NO	36	3000	4	NO	9	NO	NO	NIL	N	6	NO	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
164	7	M	691223	H	NO	N	YES	N	NO	NO	36	3100	6	NO	6	NO	NO	YES	YES	4	NO	REFER	PASS	REFER	PASS	REFER	PASS	REFER	PASS	REFER
165	7	F	694432	H	NO	N	NO	L	NO	NO	29	2100	8	NO	7	NO	NO	Y	N	20	NO	REFER	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
166	22	F	694436	H	NO	A	NO	N	NO	NO	35	2900	5	NO	4	NO	NO	NIL	N	22	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
167	10	M	699580	G	NO	N	NO	N	NO	NO	37	2800	7	NO	4	NO	NO	NIL	N	12	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
168	7	F	693424	H	NO	N	NO	N	NO	NO	38	3000	4	NO	3	NO	YES	Y	YES	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
169	7	F	693535	G	NO	N	NO	N	NO	NO	36	3200	6	NO	11	NO	NO	Y	YES	7	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
170	21	F	695656	H	NO	A	NO	N	NO	NO	36	3400	5	NO	6	NO	YES	Y	YES	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
171	9	F	692221	G	NO	N	NO	N	NO	NO	32	2100	8	NO	11	NO	YES	NIL	N	14	NO	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
172	9	M	692234	H	NO	HT	NO	L	NO	NO	35	2400	8	NO	4	NO	YES	Y	YES	5	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
173	6	F	694444	H	NO	A	NO	A	NO	NO	28	1780	8	NO	12	NO	YES	Y	YES	4	NO	PASS	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
174	5	M	695432	H	NO	A	NO	N	NO	NO	32	2200	5	NO	8	YES	NO	NIL	N	10	NO	REFER	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
175	8	F	689376	G	YES	A	NO	N	NO	NO	38	2400	5	NO	5	NO	NO	Y	YES	4	NO	PASS	REFER	PASS	REFER	PASS	REFER	PASS	REFER	PASS
176	22	F	693543	G	NO	N	NO	A	NO	NO	36	2800	7	NO	9	NO	NO	NIL	YES	3	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
177	8	M	692232	G	NO	N	NO	N	NO	NO	36	2000	9	NO	7	NO	NO	NIL	N	3	NO	PASS	REFER	PASS	REFER	PASS	REFER	REFER	REFER	REFER
178	9	M	694433	G	NO	N	NO	N	NO	NO	34	2200	9	NO	5	NO	NO	NIL	N	14	NO	PASS	REFER	PASS	REFER	PASS	REFER	REFER	REFER	REFER
179	9	M	684495	I	NO	N	NO	L	NO	NO	36	3200	8	NO	3	NO	NO	Y	N	6	NO	REFER	REFER	REFER	REFER	PASS	PASS	REFER	REFER	REFER
180	10	M	690012	H	NO	A	NO	L	NO	YES	37	2200	2	NO	4	NO	NO	Y	N	13	NO	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER

SR.NO	Age	SEX	OP/IP NUMBER	EDUCATION	CONSANGUOS MARRIAGE	ANC	FAMILY H/O DEAFNESS	MODE OF DELIVERY	TORCH INFECTION	MEDICATION	GESTATIONAL AGE IN WKS	BIRTH WEIGHT GMS	APGAR SCORE	CRANIOFACIAL ANOMALY	HYPERBILLIRUBINEMIA	NEUROLOGICAL FACTORS	INFECTION	AMINO. INJ	MECH VENTI	TOTAL DAYS I NICU	ASSO. SYND	6000R	6000L	4000R	4000L	3000R	3000L	2000R	2000L	FINAL RESULT
181	11	M	690045	H	NO	N	NO	L	NO	NO	38	2900	6	NO	4	NO	YES	Y	YES	7	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS
182	17	F	690433	H	YES	N	NO	N	NO	NO	34	2300	4	NO	7	NO	YES	NIL	YES	23	YES	PASS	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS
183	10	F	690045	H	NO	N	NO	N	NO	NO	29	2000	8	NO	3	NO	NO	Y	N	20	NO	REFER	REFER	REFER	REFER	PASS	REFER	PASS	PASS	REFER
184	6	F	690067	H	NO	N	NO	N	NO	NO	36	3000	8	NO	4	NO	NO	Y	YES	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
185	9	M	690023	H	NO	HT	YES	N	NO	NO	34	2800	4	NO	12	NO	NO	NIL	YES	16	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
186	11	M	690046	YES	NO	N	NO	N	NO	NO	30	2200	7	NO	6	NO	YES	NIL	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
187	21	M	690045	H	YES	PR	NO	N	NO	NO	34	2400	5	NO	3	NO	NO	Y	N	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS
188	11	F	690056	H	NO	N	NO	N	NO	NO	37	3000	8	NO	3	YES	NO	YES	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
189	10	M	690025	H	NO	A	NO	N	NO	YES	31	1800	8	NO	6	NO	YES	NIL	N	4	NO	PASS	REFER	PASS	REFER	REFER	REFER	REFER	REFER	REFER
190	5	F	690465	H	YES	N	NO	N	NO	NO	40	3100	8	NO	2	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
191	6	M	690045	H	NO	A	NO	N	NO	NO	30	1500	4	NO	5	NO	NO	NIL	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
192	7	F	690036	H	NO	A	NO	N	NO	NO	37	2900	8	NO	7	NO	NO	Y	YES	11	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	PASS	REFER
193	18	M	690056	H	NO	N	NO	N	NO	NO	33	2700	5	NO	10	NO	YES	NIL	N	6	NO	REFER	REFER	REFER	REFER	PASS	PASS	REFER	REFER	PASS
194	10	M	690036	G	NO	N	NO	N	NO	YES	35	2600	5	Y	8	YES	YES	NIL	YES	12	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
195	9	F	690677	H	NO	N	NO	N	NO	NO	36	3000	8	NO	5	NO	YES	Y	YES	18	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
196	8	M	691123	G	NO	N	YES	N	NO	NO	33	2500	8	NO	9	NO	NO	NIL	YES	2	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
197	12	M	693338	H	YES	HT	NO	N	NO	NO	28	1600	8	NO	11	NO	YES	NIL	N	10	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	PASS
198	19	F	694456	H	NO	N	NO	N	NO	NO	28	2000	8	NO	5	NO	YES	NIL	YES	8	NO	PASS	PASS	REFER	PASS	PASS	PASS	NOISY	PASS	PASS
199	7	F	695646	H	NO	A	NO	N	NO	NO	34	2400	9	NO	9	NO	NO	Y	YES	2	NO	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS	PASS
200	9	M	691423	H	NO	A	NO	A	NO	NO	34	1900	8	NO	7	NO	YES	Y	N	5	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
201	12	F	694536	H	NO	A	NO	L	NO	NO	28	1650	7	NO	5	NO	YES	Y	YES	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
202	22	F	694634	H	NO	A	NO	L	NO	NO	30	1700	8	NO	3	NO	NO	NIL	YES	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
203	6	F	694634	H	NO	A	NO	A	NO	NO	28	1400	5	NO	4	NO	NO	Y	N	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
204	6	F	693753	G	NO	A	NO	N	NO	NO	28	1800	7	NO	4	NO	NO	Y	N	16	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	REFER	REFER
205	6	M	694653	G	NO	N	NO	N	NO	NO	36	2900	7	NO	7	YES	NO	NIL	N	9	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
206	4	F	694745	H	NO	A	NO	N	NO	NO	28	1900	7	NO	3	NO	YES	NIL	N	16	NO	PASS	PASS	PASS	REFER	PASS	PASS	REFER	REFER	REFER
207	8	M	694743	G	NO	HT	NO	N	NO	YES	26	1100	5	NO	4	NO	YES	Y	YES	4	NO	PASS	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER
208	9	M	693442	H	NO	N	NO	N	NO	NO	35	2300	6		12	NO	NO	Y	YES	3	NO	PASS	PASS	PASS	REFER	REFER	PASS	PASS	PASS	PASS
209	11	F	692531	H	NO	N	NO	N	NO	NO	34	1800	5	NO	6	NO	YES	NIL	N	3	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
210	10	M	693641	G	NO	A	NO	N	NO	NO	29	1650	6	NO	3	NO	YES		YES	14	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
211	9	F	693624	H	NO	N	NO	A	NO	NO	34	2000	4	NO	3	NO	NO		YES	6	NO	PASS	PASS	PASS	REFER	REFER	PASS	REFER	PASS	PASS
212	7	F	694756	H	YES	N	NO	A	NO	NO	34	2100	7	NO	6	NO	NO	NIL	N	13	NO	REFER	REFER	REFER	REFER	REFER	PASS	PASS	PASS	REFER
213	8	F	692025	H	NO	N	NO	L	NO	NO	38	3000	4	NO	2	NO	NO	Y	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
214	5	F	603676	H	NO	A	NO	N	NO	YES	37	3000	4	NO	5	NO	NO	YES	N	38	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
215	14	M	690322	H	NO	N	NO	N	NO	YES	32	2200	3	NO	7	NO	NO	NIL	N	20	NO	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS
216	18	M	695757	H	YES	A	NO	N	NO	NO	26	1500	5	NO	10	NO	NO	NIL	N	10	NO	REFER	PASS	REFER	REFER	PASS	REFER	REFER	REFER	REFER
217	5	M	693803	G	NO	N	NO	L	NO	NO	28	1900	6	NO	8	NO	YES	NIL	N	16	NO	REFER	PASS	REFER	REFER	PASS	REFER	REFER	REFER	REFER
218	7	F	693033	H	NO	HT	NO	N	NO	YES	36	2800	4	NO	5	NO	NO	Y	YES	10	NO	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER	REFER
219	8	F	68463	G	NO	N	NO	L	NO	NO	36	2000	5	NO	9	NO	YES	NIL	N	6	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
220	10	M	683930	G	NO	N	NO	A	NO	YES	38	2900	6	NO	11	NO	YES	NIL	YES	4	NO	PASS	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS
221	11	F	680595	H	NO	A	NO	L	NO	NO	31	1800	5	NO	2	NO	YES	Y	YES	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
222	6	M	689876	H	NO	A	NO	L	YES	NO	30	1900	8	NO	5	NO	NO	NIL	YES	4	NO	REFER	PASS	REFER	REFER	PASS	REFER	REFER	REFER	REFER
223	8	M	689970	G	NO	A	NO	N	NO	NO	27	1200	8	NO	7	NO	NO	NIL	N	10	NO	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
224	5	M	684535	G	YES	A	NO	N	NO	NO	29	1500	4	NO	10	NO	YES	NIL	N	11	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
225	10	F	684756	H	NO	N	NO	N	NO	NO	34	2100	7	NO	8	NO	YES	Y	N	6	NO	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS

SR.NO	Age	SEX	OP/IP NUMBER	EDUCATION	CONSANGUOS MARRIAGE	ANC	FAMILY H/O DEAFNESS	MODE OF DELIVERY	TORCH INFECTION	MEDICATION	GESTATIONAL AGE IN WKS	BIRTH WEIGHT GMS	APGAR SCORE	CRANIOFACIAL ANOMALY	HYPERBILLIRUBINEMIA	NEUROLOGICAL FACTORS	INFECTION	AMINO. INJ	MECH VENTI	TOTAL DAYS I NICU	ASSO. SYND	6000R	6000L	4000R	4000L	3000R	3000L	2000R	2000L	FINAL RESULT
226	5	F	690011	H	NO	A	NO	N	NO	YES	28	1100	4	NO	10	NO	NO	Y	N	12	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
227	8	F	682911	H	NO	N	NO	L	NO	NO	39	2900	7	NO	14	NO	NO	Y	YES	18	NO	REFER	REFER	REFER	REFER	REFER	PASS	PASS	PASS	REFER
228	9	M	683522	H	NO	A	NO	L	NO	YES	28	1200	5		5	YES	NO	NIL	N	2	NO	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
229	11	M	681121	H	YES	A	NO	A	NO	NO	27	1700	7	NO	6		YES	Y	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
230	11	F	683321	H	NO	N	NO	L	NO	NO	38	3000	7	NO	4	NO	NO	Y	YES	8	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
231	16	M	685941	H	NO	HT	NO	N	YES	NO	34	1900	9	NO	2	YES	NO	NIL	N	2	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
232	7	M	684943	H	NO	N	NO	N	NO	NO	35	2500	9	NO	9	NO	YES		N	5	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	PASS	PASS
233	8	M	684932	H	NO	PR	NO	N	NO	NO	32	2000	9	NO	6	NO	NO		N	7	NO	PASS	PASS	PASS	PASS	PASS	REFER	REFER	PASS	PASS
234	5	M	684932	I	NO	N	NO	L	NO	NO	38	3300	9	NO	7	NO	NO	NIL	YES	10	NO	REFER	PASS	REFER	PASS	REFER	PASS	REFER	PASS	PASS
235	20	F	689430	H	NO	A	NO	N	NO	NO	32	1600	8	NO	4	NO	NO	Y	N	6	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
236	7	F	684900	H	NO	A	NO	A	NO	NO	35	2200	7	NO	4	NO	YES	YES	N	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
237	6	M	685940	H	NO	N	NO	N	NO	NO	35	2400	6	NO	3	NO	YES	NIL	YES	9	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
238	7	M	689453	H	NO	A	NO	N	NO	NO	36	2100	7	NO	11	NO	YES	NIL	YES	16	NO	PASS	REFER	PASS	REFER	REFER	NOISY	REFER	REFER	REFER
239	4	M	689012	H	NO	A	NO	L	NO	NO	34	2500	8	NO	6	NO	NO	NIL	N	9	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
240	9	M	654099	G	NO	N	NO	L	NO	YES	36	2100	4	NO	9	NO	YES	Y	N	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
241	12	F	675443	H	YES	N	NO	L	NO	NO	36	2900	9	NO	4	NO	YES	NIL	N	6	NO	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
242	7	F	684121	G	NO	A	NO	A	NO	NO	32	1900	9	NO	12	NO	NO	NIL	N	12	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
243	8	M	685711	H	YES	N	NO	N	NO	NO	35	2700	6	NO	8	NO	YES	Y	N	18	NO	REFER	PASS	REFER	REFER	PASS	REFER	PASS	PASS	PASS
244	11	M	686744	G	NO	N	NO	N	NO	YES	37	3000	3	NO	5	NO	YES	NIL	N	2	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
245	19	M	685945	H	NO	N	NO	L	NO	NO	38	3100	7	NO	9	YES	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS	PASS
246	16	F	690115	G	NO	N	NO	L	NO	NO	32	2800	7	NO	7	YES	NO	NIL	N	8	NO	PASS	PASS	REFER	PASS	PASS	REFER	PASS	PASS	PASS
247	8	M	690332	H	NO	A	NO	A	NO	NO	36	2800	7	NO	5	NO	NO	Y	N	2	NO	PASS	PASS	REFER	PASS	REFER	REFER	PASS	PASS	PASS
248	9	F	690112	G	NO	A	NO	N	NO	NO	32	1600	7	NO	3	NO	NO	Y	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
249	5	M	695223	H	NO	N	NO	N	NO	YES	35	2700	3	NO	4	NO	YES	Y	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
250	6	F	684734	H	NO	A	NO	N	NO	NO	28	1700	5	NO	4	YES	YES	NIL	YES	10	NO	PASS	REFER	PASS	PASS	PASS	PASS	NOISY	PASS	PASS
251	7	F	673213	H	NO	N	NO	N	NO	NO	35	2000	6	NO	7	NO	NO	Y	YES	6	NO	REFER	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
252	9	M	694632	H	NO	HT	NO	L	NO	NO	38	2800	6	NO	3	NO	YES	Y	N	16	NO	REFER	PASS	REFER	REFER	PASS	PASS	REFER	REFER	REFER
253	4	M	569987	H	NO	N	NO	L	NO	NO	36	2000	8	NO	4	NO	YES	NIL	N	9	NO	REFER	PASS	REFER	PASS	REFER	PASS	REFER	PASS	PASS
254	11	F	696977	H	NO	N	NO	N	NO	NO	36	2200	8	NO	12	NO	NO	NIL	N	16	NO	REFER	PASS	REFER	REFER	REFER	REFER	REFER	PASS	REFER
255	18	M	690364	H	NO	N	NO	N	NO	NO	34	1700	8	NO	6	NO	NO	NIL	N	6	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
256	2	F	699505	H	NO	A	NO	N	NO	NO	36	1600	8	NO	3	NO	NO	NIL	N	3	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
257	20	F	6090078	H	NO	N	NO	A	NO	NO	37	1900	9	NO	3	NO	NO	NIL	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
258	11	M	695505	H	YES	A	NO	N	NO	NO	38	2000	8	NO	6	YES	NO	Y	YES	3	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
259	8	F	697621	G	NO	A,I	NO	N	NO	YES	34	1800	2	NO	2	NO	NO	NIL	N	3	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
260	12	F	694562	H	NO	A	NO	N	NO	NO	29	1700	8	NO	5	NO	YES	NIL	YES	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
261	17	F	690033	H	NO	N	NO	L	NO	NO	36	2500	5	NO	7	NO	NO	Y	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
262	19	F	605933	G	NO	N	NO	N	NO	NO	34	1700	5	NO	10	NO	YES	Y	YES	2	NO	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
263	5	M	690043	H	NO	HT	NO	L	NO	NO	30	1800	6	NO	8	NO	YES	NIL	N	6	NO	REFER	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS
264	8	F	699943	G	NO	I	NO	N	NO	NO	34	1800	2	NO	5	NO	YES	NIL	N	9	NO	PASS	REFER	PASS	REFER	PASS	REFER	PASS	PASS	PASS
265	9	M	609155	H	YES	A	YES	L	NO	NO	37	2000	9	NO	14.49	NO	YES	NIL	YES	5	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	REFER	REFER
266	4	F	685858	H	YES	A	NO	N	NO	NO	31	1890	9	NO	10	NO	NO	NIL	N	11	NO	PASS	REFER	PASS	REFER	PASS	REFER	REFER	REFER	REFER
267	6	F	688997	G	NO	I	NO	L	NO	NO	40	3800	5	NO	14	NO	YES	NIL	N	22	NO	REFER	REFER	REFER	REFER	PASS	PASS	REFER	REFER	REFER
268	7	M	696966	G	NO	A	NO	N	NO	YES	30	1500	3	NO	5	YES	YES	NIL	N	3	NO	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
269	5	M	699097	H	NO	N	NO	L	NO	NO	37	2900	7	NO	6	NO	NO	Y	YES	3	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS
270	6	M	699066	H	NO	N	NO	N	NO	NO	33	2000	7	NO	4	NO	NO	NIL	N	6	NO	PASS	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS

SR.NO	Age	SEX	OP/IP NUMBER	EDUCATION	CONSANGUOS MARRIAGE	ANC	FAMILY H/O DEAFNESS	MODE OF DELIVERY	TORCH INFECTION	MEDICATION	GESTATIONAL AGE IN WKS	BIRTH WEIGHT GMS	APGAR SCORE	CRANIOFACIAL ANOMALY	HYPERBILLIRUBINEMIA	NEUROLOGICAL FACTORS	INFECTION	AMINO. INJ	MECH VENTI	TOTAL DAYS I NICU	ASSO. SYND	6000R	6000L	4000R	4000L	3000R	3000L	2000R	2000L	FINAL RESULT
271	3	M	693212	H	NO	A	NO	L	NO	NO	35	2200	6	NO	9	NO	NO	Y	N	12	NO	PASS	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS
272	10	M	696964	H	NO	A	NO	N	NO	NO	36	2000	9	NO	9	NO	YES	Y	YES	20	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
273	10	M	693524	G	NO	N	NO	N	NO	NO	33	2100	7	NO	11	NO	NO	Y	N	22	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
274	1	F	695634	G	NO	A	NO	L	NO	NO	28	1700	7	NO	7	NO	NO	NIL	N	12	NO	PASS	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS
275	2	F	700554	G	NO	A	NO	L	NO	NO	28	1400	6	NO	4	NO	YES	Y	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS
276	3	M	700021	H	NO	A,I	NO	N	NO	YES	32	1100	3	NO	4	NO	NO	YES	YES	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
277	11	M	700012	H	NO	N	NO	L	NO	NO	36	2100	8	NO	3	NO	NO	NIL	YES	4	NO	PASS	REFER	PASS	REFER	PASS	REFER	PASS	PASS	PASS
278	10	M	700045	H	YES	A	NO	A	NO	NO	28	1400	4	NO	11	NO	NO	NIL	YES	14	NO	REFER	REFER	REFER	REFER	REFER	REFER	PASS	PASS	REFER
279	9	F	699232	H	NO	N	NO	N	NO	NO	36	2300	4	NO	6	NO	YES	NIL	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
280	33	F	696050	G	NO	N	NO	N	NO	NO	28	1900	7	NO	9	NO	YES	Y	YES	10	NO	REFER	REFER	REFER	REFER	REFER	NOISY	REFER	PASS	REFER
281	9	M	700404	G	NO	A	NO	A	NO	NO	25	1200	7	NO	4	YES	YES	NIL	YES	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
282	9	F	700021	H	NO	N	NO	L	NO	NO	38	2500	7	NO	12	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
283	12	M	700050	H	NO	A	NO	N	NO	NO	28	1400	3	NO	8	NO	YES	Y	YES	3	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
284	10	M	69600	H	NO	N	NO	N	NO	NO	36	2700	7	NO	5	NO	YES	NIL	YES	3	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
285	6	M	700061	H	NO	A	NO	N	NO	YES	31	1900	3	NO	9	NO	NO	NIL	N	14	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
286	2	F	690034	H	NO	N	NO	N	NO	NO	34	2200	5	NO	7	NO	YES	NIL	N	6	NO	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
287	6	F	699998	H	YES	N	YES	L	NO	NO	40	2900	7	NO	5	NO	YES	YES	N	13	NO	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS	PASS
288	6	F	699055	G	NO	HT	NO	L	NO	NO	34	2600	8	NO	3	NO	NO	Y	N	7	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
289	9	M	600595	G	NO	HT,A	NO	L	NO	NO	24	1100	8	NO	4	NO	NO	Y	YES	38	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
290	5	M	700561	G	NO	N	NO	N	NO	NO	36	2100	8	NO	4	NO	NO	NIL	YES	20	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
291	4	F	700776	G	NO	A	NO	N	NO	NO	35	2000	6	NO	7	NO	NO	Y	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
292	6	M	690555	H	NO	N	NO	L	NO	NO	37	2800	6	NO	3	NO	YES	Y	YES	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
293	5	M	699995	H	NO	A	NO	N	NO	NO	31	1650	6	NO	4	NO	YES	NIL	YES	10	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
294	8	M	699934	H	NO	N	NO	N	NO	YES	38	3000	3	NO	7	NO	NO	Y	N	6	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
295	9	M	699675	H	NO	A	NO	A	NO	NO	36	2500	7	NO	14	YES	YES	Y	N	4	NO	PASS	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER
296	2	F	669743	G	NO	A	NO	N	NO	NO	38	2300	7	NO	3	NO	YES	NIL	N	4	NO	PASS	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER
297	11	F	698770	G	NO	N	NO	A	NO	NO	37	2700	9	NO	3	NO	NO	NIL	N	4	NO	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
298	M	M	699950	G	NO	A	NO	N	NO	NO	35	1900	7	NO	6	NO	NO	NIL	N	10	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
299	22	M	699324	G	NO	A	NO	N	NO	NO	30	1200	3	NO	2	NO	NO	NIL	N	11	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
300	8	M	699453	G	NO	A	NO	A	NO	NO	34	2000	5	NO	5	NO	NO	Y	YES	6	NO	PASS	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
301	9	M	700012	H	NO	A	NO	L	NO	NO	32	1400	5	NO	7	NO	NO	NIL	N	12	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
302	3	F	699354	H	NO	N	NO	L	NO	NO	36	2700	8	NO	10	YES	NO	NIL	YES	18	NO	PASS	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER
303	5	F	699967	H	NO	HT	NO	N	NO	NO	36	2300	7	NO	8	NO	YES	Y	YES	2	NO	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS
304	8	M	698576	H	NO	N	NO	N	NO	YES	32	1900	3	NO	5	NO	NO	Y	YES	4	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	PASS	REFER
305	2	M	696867	H	YES	N	NO	N	NO	NO	35	2100	9	NO	9	NO	YES	NIL	N	8	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
306	5	M	687465	H	NO	N	NO	N	NO	NO	37	2000	8	NO	11	NO	YES	NIL	YES	2	NO	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER	REFER
307	9	F	697008	H	NO	I	NO	L	NO	YES	38	2500	4	NO	5	NO	YES	NIL	YES	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
308	3	M	700584	H	NO	N	NO	N	NO	NO	36	2400	6	NO	9	NO		NIL	N	7	NO	PASS	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS
309	5	F	699505	H	NO	A	NO	A	NO	NO	24	1500	6	NO	7	NO	NO	NIL	YES	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
310	6	M	700575	H	NO	A	NO	N	NO	NO	32	1400	4	NO	5	NO	YES	NIL	YES	6	NO	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
311	6	F	690056	H	NO	N	NO	N	NO	NO	36	2200	8	NO	3	NO	YES	Y	N	16	NO	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
312	3	F	699077	H	NO	N	NO	N	NO	NO	32	2300	8	NO	4	YES	NO	NIL	N	9	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
313	2	M	609005	H	NO	A,I	NO	L	NO	NO	35	2100	3	NO	4	YES	NO	Y	N	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
314	4	M	690779	G	NO	N	NO	N	NO	NO	38	2600	4	NO	7	NO	NO	Y	N	9	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
315	6	F	689008	G	NO	HT	NO	N	NO	NO	36	2700	4	NO	3	NO	YES	Y	YES	6	NO	REFER	REFER	REFER	REFER	PASS	PASS	PASS	PASS	PASS

SR.NO	Age	SEX	OP/IP NUMBER	EDUCATION	CONSANGUOS MARRIAGE	ANC	FAMILY H/O DEAFNESS	MODE OF DELIVERY	TORCH INFECTION	MEDICATION	GESTATIONAL AGE IN WKS	BIRTH WEIGHT GMS	APGAR SCORE	CRANIOFACIAL ANOMALY	HYPERBILLIRUBINEMIA	NEUROLOGICAL FACTORS	INFECTION	AMINO. INJ	MECH VENTI	TOTAL DAYS I NICU	ASSO. SYND	6000R	6000L	4000R	4000L	3000R	3000L	2000R	2000L	FINAL RESULT
316	12	M	696952	G	NO	I	NO	A	NO	NO	34	2200	6	NO	4	NO	NO	Y	YES	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
317	20	F	690214	G	NO	I	NO	L	NO	NO	36	1900	3	NO	12	NO	NO	Y	N	20	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
318	6	F	690112	G	YES	N	NO	L	NO	NO	36	2100	8	NO	6	NO	YES	Y	YES	22	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	REFER	PASS
319	7	M	695055	H	NO	A	NO	L	NO	NO	29	1700	8	NO	3	NO	NO	Y	YES	12	NO	REFER	REFER	REFER	REFER	REFER	PASS	PASS	PASS	REFER
320	3	F	706065	H	NO	N	NO	N	NO	NO	35	2100	8	NO	3	NO	NO	NIL	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS	PASS
321	4	F	694043	H	NO	I	NO	N	NO	NO	37	2600	7	NO	6	NO	NO	Y	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	REFER	PASS
322	9	F	685755	G	YES	N	NO	N	NO	NO	38	3000	8	NO	2	NO	YES	YES	N	4	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
323	5	F	696777	G	NO	N	NO	N	NO	NO	32	2000	8	NO	5	NO	YES	NIL	N	14	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
324	11	M	690004	G	NO	A	NO	N	NO	NO	36	2300	6	NO	7	NO	YES	NIL	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
325	6	F	700021	G	NO	I	NO	N	NO	NO	32	1300	4	NO	4	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
326	7	M	696846	H	YES	HT	NO	L	NO	NO	35	1900	7	NO	8	YES	YES	Y	YES	10	YES	PASS	REFER	PASS	REFER	PASS	PASS	REFER	REFER	PASS
327	10	F	692522	H	NO	A	NO	N	NO	NO	28	1200	7	NO	5	YES	YES	NIL	N	4	NO	REFER	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
328	8	F	700012	H	NO	N	NO	A	NO	NO	36	2200	4	NO	9	NO	NO	NIL	YES	3	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
329	7	M	700475	H	NO	A	NO	N	NO	NO	38	2100	7	NO	11	NO	YES	Y	YES	13	NO	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
330	5	M	638200	H	NO	N	NO	N	NO	NO	36	2700	8	NO	2	NO	YES	NIL	YES	14	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
331	9	M	695833	G	NO	N	NO	N	NO	NO	36	2000	8	NO	5	NO	NO	NIL	N	6	NO	REFER	PASS	REFER	REFER	PASS	REFER	PASS	PASS	PASS
332	5	M	602926	G	NO	N	NO	N	NO	NO	34	1800	8	NO	7	NO	NO	NIL	YES	13	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
333	9	F	6936234	G	NO	I,A	NO	N	NO	NO	36	1700	8	NO	10	NO	NO	Y	YES	14	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS	PASS
334	6	M	693523	G	NO	A	NO	N	NO	NO	37	2000	8	NO	8	NO	NO	Y	YES	19	NO	REFER	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER
335	4	M	700363	H	NO	I,A	NO	N	NO	NO	38	1500	8	NO	5	NO	YES	Y	N	20	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
336	11	M	700573	H	NO	N	NO	N	NO	NO	34	2100	6	NO	9	YES	YES	NIL	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
337	6	M	691004	H	NO	A	NO	L	NO	NO	29	1500	5	NO	11	NO	NO	Y	N	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
338	7	F	699992	G	NO	N	NO	L	NO	NO	36	3000	8	NO		NO	YES	Y	YES	10	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
339	9	F	655499	H	NO	HT	NO	L	NO	NO	34	2800	8	NO	10	NO	YES	NIL	N	6	NO	REFER	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
340	17	M	697011	G	NO	A	NO	N	NO	NO	30	1500	5	NO	14	NO	NO	Y	N	4	NO	REFER	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
341	12	M	691034	G	NO	PR	NO	L	NO	NO	36	2700	7	NO	5	NO	NO	Y	YES	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
342	17	M	692014	H	NO	N	NO	N	NO	NO	37	2900	8	NO	6	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
343	12	F	60194	H	YES	A	NO	N	YES	NO	31	1600	8	Y	4	NO	NO	NIL	N	10	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
344	9	M	693024	H	NO	I	NO	L	NO	YES	40	3300	4	NO	10	NO	NO	NIL	N	11	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
345	8	F	700013	H	NO	N	NO	N	NO	NO	30	2100	8	NO	9	NO	NO	NIL	YES	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	NOISY	PASS	PASS
346	7	M	700089	H	NO	N	NO	N	NO	NO	37	2800	8	NO	6	NO	YES	Y	N	12	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
347	7	F	699261	H	NO	A	NO	N	NO	NO	33	1900	4	NO	7	NO	NO	NIL	N	18	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
348	22	F	691613	H	NO	N	NO	L	NO	NO	35	3000	7	NO	4	NO	YES	NIL	YES	2	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	REFER	PASS
349	10	M	691423	H	NO	N	NO	L	NO	NO	36	2200	8	NO	4	NO	YES	Y	YES	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	REFER	PASS
350	7	M	699985	H	NO	I	NO	L	NO	NO	37	2400	5	NO	3	YES	YES	Y	N	8	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
351	7	F	699685	H	NO	HT	NO	N	NO	NO	28	1700	8	NO	11	NO	NO	NIL	N	4	NO	REFER	PASS	PASS	REFER	PASS	PASS	PASS	REFER	REFER
352	21	M	695055	H	NO	A	NO	N	NO	NO	28	1550	6	NO	6	NO	NO	NIL	N	3	NO	PASS	REFER	PASS	REFER	PASS	REFER	REFER	REFER	REFER
353	9	F	629999	H	NO	I	NO	N	NO	NO	37	2700	6	NO	9	NO	YES	NIL	N	3	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	REFER	PASS
354	9	F	699373	H	NO	A	NO	N	NO	NO	32	1900	8	NO	4	NO	YES	NIL	N	14	NO	PASS	REFER	PASS	REFER	PASS	REFER	REFER	REFER	PASS
355	6	M	690433	H	NO	N	NO	N	NO	NO	33	2000	8	NO	12	NO	NO	NIL	N	6	NO	REFER	REFER	REFER	REFER	PASS	PASS	REFER	REFER	REFER
356	10	F	604437	H	NO	A	NO	N	NO	NO	30	1600	8	NO	8	NO	NO	NIL	N	13	NO	PASS	PASS	REFER	REFER	REFER	REFER	REFER	PASS	REFER
357	1	F	699888	H	NO	A	NO	N	NO	NO	28	1100	8	NO	5	NO	NO	Y	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
358	2	F	699999	H	NO	N	NO	N	NO	NO	35	2400	4	NO	9	NO	YES	NIL	N	38	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
359	3	F	702020	H	NO	A	NO	N	NO	NO	29	1200	3	NO	7	NO	NO	Y	N	20	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
360	11	M	700234	H	NO	A	NO	N	NO	NO	28	1400	7	NO	5	NO	NO	Y	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

SR.NO	Age	SEX	OP/IP NUMBER	EDUCATION	CONSANGUOS MARRIAGE	ANC	FAMILY H/O DEAFNESS	MODE OF DELIVERY	TORCH INFECTION	MEDICATION	GESTATIONAL AGE IN WKS	BIRTH WEIGHT GMS	APGAR SCORE	CRANIOFACIAL ANOMALY	HYPERBILLIRUBINEMIA	NEUROLOGICAL FACTORS	INFECTION	AMINO. INJ	MECH VENTI	TOTAL DAYS I NICU	ASSO. SYND	6000R	6000L	4000R	4000L	3000R	3000L	2000R	2000L	FINAL RESULT
361	10	F	694532	H	NO	N	NO	N	NO	NO	39	3000	7	NO	3	NO	YES	Y	YES	16	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
362	9	M	694043	H	NO	N	NO	N	NO	NO	32	2100	7	NO	4	YES	NO	NIL	YES	10	NO	PASS	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS
363	33	F	694044	G	YES	N	NO	L	NO	NO	37	2700	3	NO	4	NO	NO	Y	N	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS
364	9	F	694032	H	NO	A	NO	N	NO	NO	29	1000	3	NO	7	NO	NO	YES	N	4	NO	REFER	REFER	REFER	REFER	PASS	PASS	PASS	PASS	PASS
365	9	M	700012	G	NO	N	NO	N	YES	NO	36	2800	5	NO	3	NO	YES	NIL	N	4	NO	PASS	REFER	PASS	REFER	PASS	REFER	RR	REFER	REFER
366	12	M	770058	G	NO	PR	NO	N	NO	NO	30	2000	8	NO	4	NO	YES	NIL	N	4	NO	PASS	PASS	PASS	PASS	NOISY	PASS	PASS	PASS	PASS
367	10	M	686975	H	NO	N	NO	L	NO	NO	38	3100	6	NO	12	NO	YES	NIL	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
368	6	M	686595	H	NO	A	NO	N	NO	NO	29	1400	7	NO	6	NO	NO	Y	N	11	NO	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS
369	2	M	699987	H	NO	N	NO	N	NO	NO	34	2000	7	NO	3	NO	YES	NIL	YES	6	NO	PASS	PASS	PASS	PASS	NOISY	PASS	PASS	PASS	PASS
370	6	M	699995	H	NO	A	NO	N	NO	NO	36	2600	5	NO	3	NO	YES	NIL	N	12	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
371	6	MF	694043	G	NO	A	NO	N	NO	NO	32	1600	5	NO	6	NO	NO	Y	YES	18	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
372	9	F	697066	H	NO	N	NO	L	NO	NO	33	2000	7	NO	2	NO	YES	NIL	N	2	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
373	5	F	694044	H	NO	N	NO	N	NO	NO	37	2300	7	NO	5	YES	YES	NIL	YES	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
374	4	M	695050	H	NO	N	NO	N	NO	NO	36	2100	7	NO	7	NO	NO	NIL	N	8	NO	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
375	6	M	699521	G	NO	A	NO	L	NO	YES	34	1900	3	NO	10	NO	NO	Y	N	2	NO	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS	PASS
376	5	M	693521	G	NO	N	NO	N	NO	NO	34	2800	5	NO	8	NO	NO	Y	YES	5	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
377	8	F	694034	H	NO	N	NO	L	NO	NO	38	2800	7	NO	5	YES	NO	Y	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
378	9	M	695050	H	NO	A	NO	N	NO	YES	29	1100	4	NO	14.49	NO	YES	NIL	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
379	2	F	691101	H	NO	N	NO	L	NO	NO	37	3000	8	NO	10	YES	YES	Y	N	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
380	11	M	700052	H	NO	A	NO	N	NO	NO	28	1200	4	NO	14	NO	NO	Y	YES	16	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
381	M	F	700564	H	NO	A	NO	N	NO	NO	35	2000	4	NO	5	NO	YES	NIL	N	9	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
382	22	M	693634	G	NO	N	NO	N	NO	NO	34	1900	8	NO	6	NO	YES	NIL	N	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
383	8	M	710101	G	NO	I	NO	N	NO	NO	35	2000	6	NO	4	NO	NO	Y	YES	9	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
384	9	F	700035	G	NO	HT,A	NO	N	NO	NO	28	1700	7	NO	10	YES	NO	Y	N	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
385	3	M	704944	H	NO	I	NO	N	NO	NO	37	2600	4	NO	9	NO	NO	Y	N	6	NO	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
386	5	M	693624	H	NO	N	NO	N	NO	NO	34	2200	7	NO	6	NO	NO	NIL	N	12	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
387	8	F	700098	H	NO	I	NO	N	NO	NO	36	2700	7	NO	7	NO	NO	Y	YES	18	NO	PASS	PASS	PASS	REFER	REFER	PASS	REFER	PASS	PASS
388	2	F	70065	H	NO	A	NO	N	NO	NO	28	1500	5	NO	4	NO	NO	Y	YES	2	NO	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
389	5	M	700354	G	NO	N	NO	N	NO	NO	36	2300	7	NO	4	NO	YES	NIL	YES	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
390	9	F	699650	G	NO	I	NO	N	NO	NO	35	2000	7	NO	3	NO	NO	Y	N	8	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
391	3	F	710102	H	NO	A	NO	N	NO	NO	36	2000	8	NO	11	NO	YES	Y	YES	2	NO	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS
392	5	F	704634	H	NO	N	NO	N	NO	NO	34	2100	8	NO	6	NO	YES	Y	YES	5	NO	REFER	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
393	6	F	704944	G	NO	N	NO	N	NO	NO	36	2200	7	NO	9	NO	YES	NIL	N	7	NO	PASS	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
394	6	M	705858	H	NO	HT	YES	N	NO	NO	37	3000	8	NO	4	NO	YES	YES	YES	10	NO	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER	REFER
395	3	F	704343	H	YES	I	NO	N	NO	NO	36	2600	7	NO	12	NO	NO	Y	YES	15	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
396	2	M	695044	G	NO	HT,A	NO	L	NO	YES	29	1100	3	NO	8	NO	YES	NIL	N	16	NO	PASS	REFER	REFER	REFER	REFER	PASS	PASS	PASS	PASS
397	4	M	704104	G	NO	A	NO	N	NO	NO	35	2400	9	NO	5	NO	YES	NIL	N	9	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
398	6	F	710132	G	NO	I	NO	N	NO	NO	37	2300	4	NO	9	NO	NO	Y	N	16	NO	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
399	12	M	745454	G	NO	N	NO	N	NO	NO	38	2600	5	NO	7	NO	NO	Y	N	6	NO	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
400	20	F	703032	G	NO	A	NO	N	NO	NO	32	2000	8	NO	5	NO	NO	Y	YES	3	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	PASS	REFER
401	6	F	703931	G	NO	N	NO	N	NO	NO	36	3000	6	NO	3	NO	YES	NIL	YES	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
402	7	F	705045	G	NO	A	NO	L	NO	NO	32	2300	8	NO	4	NO	NO	Y	N	3	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
403	3	F	707075	G	NO	N	NO	N	NO	NO	35	2800	5	NO	4	NO	NO	Y	YES	3	NO	REFER	REFER	REFER	REFER	PASS	PASS	PASS	PASS	PASS

SR.NO	Age	SEX	OP/IP NUMBER	EDUCATION	CONSANGUOS MARRIAGE	ANC	FAMILY H/O DEAFNESS	MODE OF DELIVERY	TORCH INFECTION	MEDICATION	GESTATIONAL AGE IN WKS	BIRTH WEIGHT GMS	APGAR SCORE	CRANIOFACIAL ANOMALY	HYPERBILLIRUBINEMIA	NEUROLOGICAL FACTORS	INFECTION	AMINO. INJ	MECH VENTI	TOTAL DAYS I NICU	ASSO. SYND	6000R	6000L	4000R	4000L	3000R	3000L	2000R	2000L	FINAL RESULT
1	22	F	665452	I	NO	A	NO	N	YES	YES	37	2000	3	NO	13	NO	NO	NIL	YES	20	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
2	14	M	653243	H	NO	A	NO	N	NO	NO	28	1900	4	NO	10	YES	YES	Y	YES	22	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	REFER	PASS
3	26	M	662195	H	YES	N	NO	A	NO	NO	32	2100	3	NO	14	NO	YES	Y	N	12	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS
4	23	M	633433	G	NO	A	NO	N	NO	NO	35	2000	5	NO	5	NO	NO	NIL	N	7	NO	PASS	PASS	PASS	PASS	REFER	PASS	REFER	PASS	PASS
5	30	F	626153	G	NO	N	NO	N	NO	NO	35	2100	3	NO	6	NO	NO	NIL	N	7	NO	REFER	REFER	PASS	REFER	PASS	REFER	PASS	PASS	PASS
6	7	M	611677	H	NO	N	NO	N	NO	NO	36	2400	4	NO	4	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
7	6	F	652670	G	NO	A	NO	L	NO	NO	34	1900	5	NO	10	I	YES	Y	YES	14	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
8	5	M	658790	G	NO	A	NO	N	NO	NO	36	1700	4	NO	9	NO	NO	NIL	N	5	NO	PASS	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS
9	5	F	634728	H	NO	N	NO	N	NO	NO	36	2500	4	NO	6	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS
10	11	M	633005	H	NO	HT,A	NO	A	NO	NO	29	1500	3	NO	7	NO	YES	Y	YES	10	NO	REFER	REFER	REFER	REFER	PASS	PASS	REFER	REFER	REFER
11	4	M	634360	H	NO	N	NO	N	NO	NO	35	2000	4	NO	4	NO	NO	NIL	N	4	NO	PASS	REFER	PASS	REFER	PASS	REFER	PASS	PASS	PASS
12	4	F	634360	H	NO	A	NO	A	NO	NO	37	2100	3	NO	4	NO	NO	NIL	N	3	NO	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS
13	1	M	634632	H	YES	N	NO	N	NO	NO	38	2500	4	NO	3	NO	NO	NIL	N	3	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
14	20	M	650615	H	NO	N	NO	A	NO	NO	32	2000	5	NO	11	I	YES	Y	YES	14	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	PASS	REFER
15	5	F	653794	G	YES	A	NO	L	NO	NO	36	1800	4	NO	6	NO	YES	Y	N	6	NO	PASS	PASS	PASS	PASS	NOISY	PASS	REFER	REFER	PASS
16	7	F	653475	H	YES	A	NO	N	NO	NO	32	1600	3	NO	9	NO	YES	Y	N	13	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
17	44	M	648783	G	NO	HT	NO	A	NO	YES	35	2000	4	NO	4	NO	NO	NIL	YES	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
18	30	F	648658	H	NO	A	NO	N	NO	YES	28	1400	3	NO	12	NO	YES	Y	YES	38	YES	REFER	REFER	REFER	PASS	REFER	PASS	REFER	PASS	PASS
19	15	F	651930	H	YES	A	NO	N	NO	YES	32	1900	3	NO	8	NO	YES	Y	N	20	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	REFER	PASS
20	9	F	641546	H	NO	N	NO	L	NO	YES	38	2600	4	NO	5	NO	NO	NIL	N	10	NO	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS	PASS
21	4	F	611925	H	YES	A	NO	N	NO	NO	36	1900	4	NO	9	NO	YES	Y	N	16	NO	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS	PASS
22	8	M	650652	H	YES	A	NO	L	NO	NO	36	2000	3	NO	7	NO	YES	Y	N	10	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	REFER	PASS
23	14	F	649131	H	NO	A	NO	L	NO	NO	34	2100	4	NO	5	NO	NO	NIL	N	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
24	7	M	650891	G	NO	N	NO	A	NO	NO	36	2150	3	NO	3	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
25	3	M	651557	H	YES	A	NO	L	NO	NO	37	2300	4	NO	4	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
26	8	F	645579	G	NO	A	NO	L	NO	NO	38	2200	4	NO	4	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	NOISY	PASS
27	8	M	645719	G	NO	A	NO	A	NO	NO	34	2100	3	NO	7	I	YES	Y	N	10	NO	REFER	PASS	PASS	PASS	PASS	PASS	REFER	NOISY	PASS
28	11	F	655683	G	NO	A	NO	N	NO	NO	29	1800	5	NO	3	NO	YES	NIL	N	11	NO	PASS	PASS	PASS	REFER	PASS	PASS	REFER	NOISY	PASS
29	8	F	645485	G	YES	A	NO	L	NO	NO	36	2000	4	NO	4	NO	NO	NIL	N	6	NO	PASS	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER
30	8	F	645483	G	NO	A	NO	N	NO	NO	34	1900	3	NO	12	YES	YES	Y	YES	12	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	REFER	PASS
31	27	F	652497	H	NO	A	NO	A	NO	YES	28	2000	5	NO	6	NO	YES	Y	YES	18	NO	REFER	PASS	REFER	PASS	REFER	PASS	PASS	PASS	PASS
32	8	M	652091	G	YES	N	NO	A	NO	NO	34	2000	3	NO	3	NO	NO	NIL	N	2	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
33	7	M	628582	H	NO	A	NO	N	NO	NO	37	2100	4	NO	3	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	REFER	PASS	REFER	REFER	PASS
34	11	M	654342	H	NO	A	YES	N	NO	NO	31	1700	3	NO	6	NO	NO	NIL	N	8	NO	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
35	5	F	654590	H	YES	N	NO	L	NO	NO	40	2800	2	NO	2	NO	NO	NIL	N	2	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
36	2	F	629620	G	NO	A	NO	N	NO	NO	30	1700	4	NO	5	NO	NO	NIL	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	REFER	PASS
37	6	M	628671	G	NO	N	NO	N	NO	NO	37	2100	3	NO	7	I	NO	NIL	N	7	NO	PASS	PASS	PASS	PASS	REFER	PASS	REFER	REFER	PASS
38	19	F	635277	G	NO	A	NO	N	NO	NO	33	1900	3	NO	10	NO	YES	Y	YES	10	NO	REFER	PASS	REFER	REFER	PASS	REFER	REFER	REFER	REFER
39	15	M	611928	G	YES	N	YES	A	NO	NO	35	2200	4	NO	8	NO	NO	NIL	N	6	NO	REFER	PASS	REFER	REFER	PASS	REFER	REFER	REFER	REFER
40	30	M	643270	G	NO	N	NO	L	NO	YES	36	2100	6	NO	5	NO	YES	Y	YES	16	NO	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER	REFER
41	17	M	652484	G	NO	HT	NO	N	NO	NO	33	1900	6	NO	13	YES	YES	Y	N	9	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
42	21	F	649053	G	YES	A	NO	N	NO	NO	28	1700	4	NO	10	YES	YES	Y	YES	16	NO	PASS	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS
43	9	F	641548	G	NO	PR	NO	A	NO	NO	28	1800	7	NO	14	NO	YES	NIL	N	14	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
44	3	F	642460	G	YES	I	NO	N	NO	NO	28	1100	3	NO	5	NO	NO	Y	N	20	NO	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
45	6	M	654097	H	YES	A	NO	A	NO	NO	32	1800	7	NO	6	YES	YES	YES	YES	22	NO	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
46	8	M	632421	H	NO	A	NO	N	NO	NO	25	1400	6	Y	4	NO	YES	NIL	N	12	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
47	14	F	634221	H	NO	A	NO	A	NO	NO	30	2300	8	NO	10	YES	NO	NIL	N	7	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS
48	4	M	645345	H	NO	I	NO	N	NO	NO	28	1650	6	NO	9	YES	NO	NIL	N	7	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
49	20	M	625923	H	NO	HT,A	NO	N	NO	NO	25	1100	6	NO	6	NO	NO	Y	YES	4	NO	REFER	REFER	REFER	REFER	REFER	PASS	PASS	PASS	REFER
50	5	M	628879	H	NO	A	NO	A	NO	YES	29	1600	7	NO	7	YES	YES	NIL	N	14	NO	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
51	5	M	628712	H	NO	A	NO	N	NO	YES	28	1300	7	NO	4	YES	NO	NIL	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
52	8	F	628423	H	NO	A	NO	N	NO	NO	26	1400	7	NO	4	NO	NO	Y	YES	12	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
53	1	F	654297	G	YES	N	NO	L	NO	NO	31	2000	8	NO	3	NO	YES	NIL	N	10	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
54	15	M	628566	G	NO	N	NO	L	NO	NO	34	2900	8	NO	11	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	REFER	PASS
55	16	M	627027	G	NO	A	NO	N	NO	NO	29	1400	8	NO	6	NO	NO	NIL	N	3	NO	PASS	PASS	PASS	PASS	PASS	REFER	REFER	REFER	PASS
56	13	M	650014	G	NO	A	NO	A	NO	NO	24	1100	4	NO	9	NO	NO	Y	YES	3	NO	REFER	PASS	REFER	PASS	REFER	PASS	REFER	PASS	PASS
57	9	M	650920	G	NO	A	NO	A	NO	NO	28	1600	4	NO	4	NO	YES	Y	YES	14	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
58	7	F	651961	G	NO	N	NO	N	NO	YES	28	1900	5	NO	12	NO	YES	Y	YES	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
59	4	F	643521	H	NO	HT,A	NO	N	NO	NO	29	1500	7	NO	8	YES	YES	NIL	N	13	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
60	25	M	638560	G	YES	A	NO	N	NO	NO	29	1600	3	NO	5	NO	NO	Y	YES	7	NO	PASS	REFER	PASS	REFER	PASS	PASS	REFER	REFER	PASS
61	4	M	642291	H	NO	I	NO	N	NO	NO	34	1800	4	NO	9	NO	YES	Y	YES	38	NO	REFER	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
62	5	M	643386	G	NO	HT,A	NO	A	NO	NO	28	1400	4	NO	7	NO	YES	NIL	N	20	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
63	16	F	635397	H	YES	A	NO	A	NO	NO	26	1750	4	NO	5	NO	NO	Y	YES	10	NO	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
64	13	M	640804	H	NO	N	NO	L	NO	NO	37	2900	4	NO	3	NO	YES	Y	YES	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
65	28	F	643877	H	NO	A	NO	N	NO	NO	24	1000	5	NO	4	NO	YES	NIL	N	10	NO	PASS	PASS	PASS	REFER	PASS	REFER	PASS	PASS	PASS
66	10	M	659860	H	NO	A	NO	L	NO	NO	31	2000	7	NO	4	NO	NO	NIL	N	6	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
67	6	F	639954	G	NO	A	NO	A	NO	NO	30	1500	7	NO	7	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	NOISY	REFER	PASS	PASS

SR.NO	Age	SEX	OP/IP NUMBER	EDUCATION	CONSANGUOS MARRIAGE	ANC	FAMILY H/O DEAFNESS	MODE OF DELIVERY	TORCH INFECTION	MEDICATION	GESTATIONAL AGE IN WKS	BIRTH WEIGHT GMS	APGAR SCORE	CRANIOFACIAL ANOMALY	HYPERBILIRUBINEMIA	NEUROLOGICAL FACTORS	INFECTION	AMINO. INJ	MECH VENTI	TOTAL DAYS I NICU	ASSO. SYND	6000R	6000L	4000R	4000L	3000R	3000L	2000R	2000L	FINAL RESULT
68	3	F	643635	G	YES	N	NO	N	NO	NO	29	1700	4	NO	3	YES	NO	NIL	N	4	NO	PASS	PASS	REFER	PASS	PASS	REFER	PASS	REFER	PASS
69	11	M	642421	G	NO	I	NO	L	NO	NO	39	2900	6	NO	4	YES	NO	Y	YES	4	NO	PASS	PASS	REFER	PASS	REFER	REFER	PASS	PASS	PASS
70	1	M	642772	G	YES	N	NO	N	NO	NO	30	1800	4	NO	12	NO	YES	NIL	YES	10	YES	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
71	13	F	640715	G	YES	A	NO	N	NO	YES	28	1500	6	NO	6	NO	YES	NIL	N	11	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
72	17	M	648791	G	YES	A	NO	L	NO	NO	29	2200	7	NO	3	YES	NO	Y	YES	6	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
73	3	F	658578	G	NO	HT	NO	A	NO	NO	28	1890	7	NO	3	NO	YES	Y	YES	12	NO	REFER	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
74	6	F	657954	G	NO	A	NO	N	NO	NO	27	1600	7	NO	6	NO	YES	NIL	N	18	NO	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
75	8	M	657692	G	NO	N	NO	N	NO	NO	28	1800	6	NO	2	NO	NO	NIL	N	2	NO	REFER	PASS	REFER	PASS	REFER	PASS	REFER	PASS	PASS
76	8	F	656626	G	NO	A	NO	N	NO	NO	30	1900	5	NO	5	YES	NO	NIL	N	4	NO	REFER	PASS	REFER	REFER	REFER	REFER	REFER	PASS	REFER
77	7	F	656698	G	NO	A	NO	L	NO	NO	24	1350	5	NO	7	YES	NO	YES	N	8	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
78	7	F	656700	H	YES	N	NO	N	NO	NO	32	1800	6	NO	10	NO	NO	YES	N	8	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
79	3	F	657509	H	NO	A	NO	N	NO	NO	28	1700	6	NO	8	NO	NO	N	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
80	20	M	657148	H	NO	A	NO	A	NO	YES	32	1600	6	NO	5	NO	NO	N	YES	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
81	2	F	644266	H	NO	A	NO	L	NO	NO	35	2100	8	NO	9	YES	YES	N	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
82	5	M	654813	G	NO	A	NO	N	NO	NO	35	1700	7	NO	11	NO	NO	YES	YES	6	NO	PASS	REFER	PASS	REFER	REFER	REFER	REFER	PASS	REFER
83	5	F	645850	G	NO	N	NO	L	NO	NO	36	2700	3	NO	5	NO	YES	N	YES	16	NO	PASS	PASS	PASS	REFER	REFER	REFER	PASS	PASS	PASS
84	5	F	645848	G	YES	A	NO	N	NO	NO	34	1450	4	NO	9	NO	YES	N	YES	9	NO	PASS	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
85	1	M	654987	G	NO	N	NO	N	NO	NO	36	1750	4	NO	7	NO	YES	YES	N	16	NO	REFER	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
86	16	M	622345	G	NO	A	NO	L	NO	NO	36	3000	6	NO	5	NO	NO	N	YES	9	NO	PASS	REFER	PASS	REFER	PASS	REFER	PASS	REFER	PASS
87	20	M	623415	G	NO	A	NO	L	NO	NO	29	1500	5	NO	3	NO	NO	N	YES	16	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	REFER	PASS
88	18	M	688954	G	NO	PR	NO	L	NO	YES	35	2000	5	NO	4	NO	YES	N	N	6	NO	PASS	REFER	PASS	REFER	PASS	REFER	REFER	REFER	REFER
89	8	F	675556	H	NO	N	NO	N	YES	NO	37	2100	6	NO	4	NO	YES	YES	YES	12	NO	REFER	REFER	REFER	REFER	PASS	PASS	REFER	REFER	REFER
90	10	F	666875	H	YES	N	NO	L	NO	NO	38	2800	4	NO	7	NO	NO	YES	YES	18	NO	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
91	1	M	677890	H	NO	A	NO	N	NO	NO	32	1100	3	NO	3	NO	NO	YES	N	2	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS
92	2	F	688754	G	NO	A	NO	A	NO	NO	36	1750	7	NO	4	NO	NO	N	N	4	NO	PASS	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS
93	3	M	685594	G	NO	A	YES	N	NO	NO	32	1800	7	NO	12	NO	YES	YES	N	8	NO	REFER	REFER	REFER	REFER	PASS	REFER	PASS	PASS	REFER
94	11	M	653410	G	NO	N	NO	L	NO	NO	35	2900	3	NO	6	NO	NO	YES	N	2	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
95	10	M	675993	G	YES	A	NO	N	NO	NO	28	1400	3	NO	3	NO	NO	N	YES	5	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
96	9	F	675502	G	NO	A	NO	N	NO	NO	32	1900	8	NO	3	NO	YES	YES	YES	7	NO	PASS	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS
97	33	M	670043	G	NO	A	NO	L	NO	NO	38	2880	8	NO	6	NO	NO	YES	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS
98	9	F	679900	G	NO	HT	NO	L	NO	NO	36	2600	7	NO	2	NO	NO	N	YES	6	NO	REFER	REFER	REFER	REFER	PASS	PASS	PASS	PASS	PASS
99	9	M	678543	G	YES	A	NO	A	NO	NO	32	1650	7	NO	5	YES	NO	N	YES	16	NO	PASS	REFER	PASS	REFER	PASS	REFER	PASS	PASS	REFER
100	12	F	681111	G	NO	A	NO	N	NO	NO	34	1800	7	NO	7	NO	YES	N	N	9	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
101	10	M	678221	G	YES	A	NO	L	NO	NO	36	3300	3	NO	10	NO	YES	N	N	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
102	6	M	674532	G	NO	N	NO	L	NO	NO	37	2800	9	NO	8	NO	YES	YES	N	6	NO	REFER	REFER	REFER	REFER	REFER	PASS	REFER	PASS	REFER
103	2	F	674439	G	NO	A	NO	L	NO	NO	38	3200	9	NO	5	NO	NO	YES	N	3	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
104	6	M	680001	G	NO	N	NO	N	NO	NO	34	2300	4	NO	9	NO	YES	N	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
105	6	M	680051	H	NO	A	NO	N	NO	NO	29	1300	8	NO	11	NO	YES	YES	N	11	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
106	9	F	680012	H	NO	A	NO	L	NO	NO	36	3000	3	NO	2	NO	NO	YES	YES	3	NO	REFER	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
107	5	F	680031	H	NO	N	NO	L	NO	YES	34	2200	2	NO	5	NO	YES	N	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
108	4	M	680013	H	NO	A	NO	N	NO	NO	30	1800	8	NO	7	NO	YES	N	YES	7	NO	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
109	6	F	684432	H	YES	N	NO	N	NO	NO	34	2500	6	NO	10	NO	NO	N	YES	2	NO	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS	PASS
110	5	F	679990	H	NO	N	NO	L	NO	NO	37	2200	6	NO	8	NO	NO	N	YES	6	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
111	8	F	688001	H	NO	HT,A	NO	N	NO	NO	31	1200	6	NO	5	NO	NO	N	N	9	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
112	9	F	687990	G	NO	N	NO	L	NO	NO	40	3200	6	NO	9	NO	NO	N	YES	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
113	2	M	680015	G	NO	A	NO	L	NO	YES	30	1900	6	NO	11	NO	YES	YES	YES	11	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
114	11	F	680022	G	NO	N	NO	A	NO	NO	37	2000	6	YES	7	NO	YES	N	N	22	NO	REFER	REFER	PASS	REFER	REFER	REFER	REFER	PASS	REFER
115	6	M	680026	G	NO	HT	NO	A	NO	NO	33	2300	8	NO	5	NO	NO	YES	N	3	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
116	22	M	680044	G	NO	N	NO	L	NO	NO	35	2300	7	NO	10	NO	YES	YES	N	3	NO	PASS	PASS	PASS	REFER	PASS	PASS	REFER	PASS	PASS
117	8	F	680078	G	NO	N	NO	L	NO	NO	36	2800	7	NO	14	NO	YES	YES	N	6	NO	PASS	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER
118	9	M	680098	G	NO	A	NO	N	YES	NO	33	1100	3	NO	5	NO	NO	Y	YES	7	NO	PASS	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS
119	3	F	680102	G	NO	N	NO	L	NO	NO	28	2400	8	NO	6	NO	NO	Y	N	20	NO	REFER	PASS	REFER	PASS	REFER	PASS	REFER	REFER	REFER
120	5	F	681004	H	NO	A	NO	N	NO	NO	28	1200	3	NO	4	YES	NO	NIL	N	22	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
121	8	F	681110	H	YES	N	NO	N	NO	NO	28	1900	7	NO	10	NO	NO	NIL	YES	12	NO	PASS	PASS	PASS	REFER	REFER	PASS	REFER	PASS	PASS
122	2	F	681120	H	YES	N	NO	N	NO	NO	32	2000	8	NO	9	NO	NO	NIL	N	7	NO	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS
123	5	M	681178	H	NO	N	NO	N	NO	NO	25	2100	9	NO	6	NO	NO	NIL	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
124	9	M	681167	H	YES	A	NO	N	NO	NO	30	1150	4	NO	7	NO	YES	NIL	N	4	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
125	3	M	681132	H	NO	A	NO	L	NO	YES	28	1500	3	NO	4	NO	NO	NIL	YES	14	NO	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS
126	5	F	681122	H	NO	HT	NO	N	NO	NO	25	1450	3	NO	4	NO	YES	Y	N	5	NO	REFER	PASS	REFER	REFER	PASS	REFER	REFER	PASS	REFER
127	6	F	675480	H	NO	N	NO	N	NO	NO	29	1800	8	NO	3	NO	YES	NIL	N	4	NO	REFER	PASS	REFER	REFER	PASS	REFER	REFER	REFER	REFER
128	6	M	691123	H	NO	A	NO	N	NO	NO	28	1500	7	NO	11	NO	YES	Y	YES	10	NO	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER	REFER
129	3	F	689999	H	NO	A	NO	A	NO	NO	26	1600	8	NO	6	NO	NO	Y	YES	4	NO	PASS	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
130	2	M	668890	G	NO	N	NO	N	NO	NO	31	1700	7	NO	9	NO	NO	Y	N	3	NO	PASS	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS
131	4	M	699870	G	NO	N	NO	A	NO	NO	34	2000	3	NO	4	NO	YES	NIL	N	3	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
132	6	M	678122	G	NO	A	NO	N	NO	YES	29	1200	3	NO	12	NO	YES	Y	N	14	NO	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
133	12	F	677894	G	NO	A	NO	N	NO	NO	34	2060	7	YES	8	NO	NO	YES	N	6	NO	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
134	20	F	690011	G	NO	A	YES	N	NO	NO	31	1700	7	NO	5	NO	NO	NIL	N	13	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER

SR.NO	Age	SEX	OP/IP NUMBER	EDUCATION	CONSANGUOS MARRIAGE	ANC	FAMILY H/O DEAFNESS	MODE OF DELIVERY	TORCH INFECTION	MEDICATION	GESTATIONAL AGE IN WKS	BIRTH WEIGHT GMS	APGAR SCORE	CRANIOFACIAL ANOMALY	HYPERBILLIRUBINEMIA	NEUROLOGICAL FACTORS	INFECTION	AMINO. INJ	MECH VENTI	TOTAL DAYS I NICU	ASSO. SYND	6000R	6000L	4000R	4000L	3000R	3000L	2000R	2000L	FINAL RESULT
135	6	F	690032	G	YES	A	NO	N	NO	YES	28	1550	6	NO	9	NO	NO	NIL	N	7	NO	REFER	NOISY	REFER	REFER	REFER	REFER	REFER	REFER	REFER
136	7	M	689008	H	NO	A	NO	N	NO	NO	29	2150	6	NO	7	NO	YES	NIL	N	38	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
137	3	M	689536	H	NO	N	NO	L	NO	NO	36	1900	6	NO	5	NO	NO	Y	N	20	NO	REFER	REFER	REFER	REFER	REFER	PASS	PASS	PASS	REFER
138	4	F	689364	H	NO	A	NO	N	NO	NO	26	1500	5	NO	3	NO	NO	NIL	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
139	9	M	690133	G	NO	HT,A	NO	L	NO	NO	28	1200	7	NO	4	NO	YES	NIL	N	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
140	5	M	689947	G	NO	N	NO	A	NO	YES	38	3300	4	NO	4	NO	NO	Y	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
141	11	M	689904	G	NO	A	NO	L	NO	NO	35	2000	7	NO	7	NO	NO	NIL	YES	6	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	PASS
142	6	M	698701	G	NO	A	NO	N	NO	NO	24	1400	6	NO	3	YES	NO	NIL	YES	12	NO	REFER	PASS	PASS	REFER	REFER	REFER	REFER	PASS	PASS
143	7	F	690133	G	NO	N	NO	N	NO	NO	31	1900	6	NO	4	NO	YES	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	REFER	PASS
144	10	F	690566	G	NO	A	NO	N	NO	NO	30	1600	5	NO	12	NO	YES	Y	N	4	NO	REFER	PASS	REFER	PASS	REFER	REFER	REFER	PASS	REFER
145	8	M	688897	G	NO	N	NO	L	NO	NO	33	1800	7	NO	6	NO	YES	Y	N	10	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
146	7	M	688890	I	YES	A	NO	L	NO	NO	29	2000	8	NO	3	NO	NO	Y	N	11	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
147	5	M	690001	G	YES	A	NO	N	NO	NO	30	2300	8	NO	3	NO	YES	NIL	N	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
148	9	M	690078	G	NO	A	NO	N	NO	NO	28	1700	7	NO	6	NO	YES	Y	N	12	NO	PASS	REFER	PASS	REFER	REFER	REFER	REFER	REFER	REFER
149	5	F	690073	G	NO	A	NO	A	NO	NO	29	1800	9	NO	2	NO	NO	Y	YES	18	NO	REFER	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
150	9	F	690021	H	NO	A	NO	N	NO	YES	32	1800	3	NO	5	NO	YES	NIL	N	2	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
151	6	M	677775	H	NO	N	NO	N	NO	NO	35	2400	3	NO	7	NO	YES	NIL	YES	4	NO	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
152	4	M	683635	G	NO	N	NO	N	NO	NO	35	2300	6	NO	10	NO	NO	Y	N	8	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
153	11	M	680676	G	YES	A	NO	N	NO	NO	37	2800	5	NO	8	NO	NO	Y	YES	2	NO	REFER	PASS	REFER	REFER	PASS	REFER	REFER	PASS	REFER
154	6	F	688940	G	NO	A	NO	N	NO	NO	24	1400	5	NO	5	NO	NO	Y	N	5	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS
155	7	M	689009	G	NO	I	NO	N	NO	NO	32	2000	8	NO	12	NO	NO	NIL	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS	PASS
156	9	F	686879	G	NO	A	NO	A	NO	NO	28	1600	5	NO	10	NO	YES	Y	YES	10	NO	PASS	PASS	REFER	PASS	REFER	PASS	PASS	REFER	PASS
157	17	M	698014	G	NO	N	NO	N	NO	NO	32	1800	6	NO	14	NO	YES	Y	N	6	NO	PASS	PASS	REFER	PASS	REFER	REFER	PASS	PASS	REFER
158	12	F	691122	G	NO	A	NO	N	NO	NO	35	2600	2	NO	5	NO	NO	NIL	N	16	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
159	17	F	691163	H	YES	N	NO	N	NO	NO	35	2500	3	NO	6	NO	YES	Y	N	9	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
160	12	M	690023	H	NO	A	NO	N	NO	NO	36	2900	5	NO	4	NO	YES	Y	YES	16	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
161	9	M	691112	H	NO	N	NO	N	NO	NO	34	2500	8	NO	10	NO	NO	Y	N	9	NO	REFER	REFER	REFER	PASS	PASS	PASS	REFER	REFER	REFER
162	8	F	609334	H	NO	A	NO	N	NO	NO	36	3000	4	NO	9	NO	NO	NIL	N	6	NO	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
163	7	M	691223	H	NO	N	YES	N	NO	NO	36	3100	6	NO	6	NO	NO	YES	YES	4	NO	REFER	PASS	REFER	PASS	REFER	PASS	REFER	PASS	REFER
164	7	F	694432	H	NO	N	NO	L	NO	NO	29	2100	8	NO	7	NO	NO	Y	N	20	NO	REFER	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
165	22	F	694436	H	NO	A	NO	N	NO	NO	35	2900	5	NO	4	NO	NO	NIL	N	22	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
166	10	M	699580	G	NO	N	NO	N	NO	NO	37	2800	7	NO	4	NO	NO	NIL	N	12	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
167	7	F	693424	H	NO	N	NO	N	NO	NO	38	3000	4	NO	3	NO	YES	Y	YES	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
168	7	F	693535	G	NO	N	NO	N	NO	NO	36	3200	6	NO	11	NO	NO	Y	YES	7	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
169	21	F	695656	H	NO	A	NO	N	NO	NO	36	3400	5	NO	6	NO	YES	Y	YES	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
170	9	F	692221	G	NO	N	NO	N	NO	NO	32	2100	8	NO	11	NO	YES	NIL	N	14	NO	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
171	9	M	692234	H	NO	HT	NO	L	NO	NO	35	2400	8	NO	4	NO	YES	Y	YES	5	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
172	6	F	694444	H	NO	A	NO	A	NO	NO	28	1780	8	NO	12	NO	YES	Y	YES	4	NO	PASS	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
173	5	M	695432	H	NO	A	NO	N	NO	NO	32	2200	5	NO	8	YES	NO	NIL	N	10	NO	REFER	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
174	8	F	689376	G	YES	A	NO	N	NO	NO	38	2400	5	NO	5	NO	NO	Y	YES	4	NO	PASS	REFER	PASS	REFER	PASS	REFER	PASS	REFER	PASS
175	22	F	693543	G	NO	N	NO	A	NO	NO	36	2800	7	NO	9	NO	NO	NIL	YES	3	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
176	8	M	692232	G	NO	N	NO	N	NO	NO	36	2000	9	NO	7	NO	NO	NIL	N	3	NO	PASS	REFER	PASS	REFER	PASS	REFER	REFER	REFER	REFER
177	9	M	694433	G	NO	N	NO	N	NO	NO	34	2200	9	NO	5	NO	NO	NIL	N	14	NO	PASS	REFER	PASS	REFER	PASS	REFER	REFER	REFER	REFER
178	9	M	684495	I	NO	N	NO	L	NO	NO	36	3200	8	NO	3	NO	NO	Y	N	6	NO	REFER	REFER	REFER	REFER	PASS	PASS	REFER	REFER	REFER
179	10	M	690012	H	NO	A	NO	L	NO	YES	37	2200	2	NO	4	NO	NO	Y	N	13	NO	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
180	11	M	690045	H	NO	N	NO	L	NO	NO	38	2900	6	NO	4	NO	YES	Y	YES	7	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS
181	17	F	690433	H	YES	N	NO	N	NO	NO	34	2300	4	NO	7	NO	YES	NIL	YES	23	YES	PASS	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS
182	10	F	690045	H	NO	N	NO	N	NO	NO	29	2000	8	NO	3	NO	NO	Y	N	20	NO	REFER	REFER	REFER	REFER	PASS	REFER	PASS	PASS	REFER
183	6	F	690067	H	NO	N	NO	N	NO	NO	36	3000	8	NO	4	NO	NO	Y	YES	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
184	9	M	690023	H	NO	HT	YES	N	NO	NO	34	2800	4	NO	12	NO	NO	NIL	YES	16	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
185	11	M	690046	G	NO	N	NO	N	NO	NO	30	2200	7	NO	6	NO	YES	NIL	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
186	21	M	690045	H	YES	PR	NO	N	NO	NO	34	2400	5	NO	3	NO	NO	Y	N	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS
187	11	F	690056	H	NO	N	NO	N	NO	NO	37	3000	8	NO	3	YES	NO	YES	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
188	10	M	690025	H	NO	A	NO	N	NO	YES	31	1800	8	NO	6	NO	YES	NIL	N	4	NO	PASS	REFER	PASS	REFER	REFER	REFER	REFER	REFER	REFER
189	5	F	690465	H	YES	N	NO	N	NO	NO	40	3100	8	NO	2	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
190	6	M	690045	H	NO	A	NO	N	NO	NO	30	1500	4	NO	5	NO	NO	NIL	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
191	7	F	690036	H	NO	A	NO	N	NO	NO	37	2900	8	NO	7	NO	NO	Y	YES	11	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	PASS	REFER
192	18	M	690056	H	NO	N	NO	N	NO	NO	33	2700	5	NO	10	NO	YES	NIL	N	6	NO	REFER	REFER	REFER	REFER	PASS	PASS	REFER	REFER	PASS
193	10	M	690036	G	NO	N	NO	N	NO	YES	35	2600	5	Y	8	YES	YES	NIL	YES	12	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
194	9	F	690677	H	NO	N	NO	N	NO	NO	36	3000	8	NO	5	NO	YES	Y	YES	18	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
195	8	M	691123	G	NO	N	YES	N	NO	NO	33	2500	8	NO	9	NO	NO	NIL	YES	2	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
196	12	M	693338	H	YES	HT	NO	N	NO	NO	28	1600	8	NO	11	NO	YES	NIL	N	10	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	PASS
197	19	F	694456	H	NO	N	NO	N	NO	NO	28	2000	8	NO	5	NO	YES	NIL	YES	8	NO	PASS	PASS	REFER	PASS	PASS	PASS	NOISY	PASS	PASS
198	7	F	695646	H	NO	A	NO	N	NO	NO	34	2400	9	NO	9	NO	NO	Y	YES	2	NO	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS	PASS
199	9	M	691423	H	NO	A	NO	A	NO	NO	34	1900	8	NO	7	NO	YES	Y	N	5	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
200	12	F	694536	H	NO	A	NO	L	NO	NO	28	1650	7	NO	5	NO	YES	Y	YES	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
201	22	F	694634	H	NO	A	NO	L	NO	NO	30	1700	8	NO	3	NO	NO	NIL	YES	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

SR.NO	Age	SEX	OP/IP NUMBER	EDUCATION	CONSANGUOS MARRIAGE	ANC	FAMILY H/O DEAFNESS	MODE OF DELIVERY	TORCH INFECTION	MEDICATION	GESTATIONAL AGE IN WKS	BIRTH WEIGHT GMS	APGAR SCORE	CRANIOFACIAL ANOMALY	HYPERBILIRUBINEMIA	NEUROLOGICAL FACTORS	INFECTION	AMINO. INJ	MECH VENTI	TOTAL DAYS I NICU	ASSO. SYND	6000R	6000L	4000R	4000L	3000R	3000L	2000R	2000L	FINAL RESULT
202	6	F	694634	H	NO	A	NO	A	NO	NO	28	1400	5	NO	4	NO	NO	Y	N	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
203	6	F	693753	G	NO	A	NO	N	NO	NO	28	1800	7	NO	4	NO	NO	Y	N	16	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	REFER	REFER
204	6	M	694653	G	NO	N	NO	N	NO	NO	36	2900	7	NO	7	YES	NO	NIL	N	9	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
205	4	F	694745	H	NO	A	NO	N	NO	NO	28	1900	7	NO	3	NO	YES	NIL	N	16	NO	PASS	PASS	PASS	REFER	PASS	PASS	REFER	REFER	REFER
206	8	M	694743	G	NO	HT	NO	N	NO	YES	26	1100	5	NO	4	NO	YES	Y	YES	4	NO	PASS	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER
207	9	M	693442	H	NO	N	NO	N	NO	NO	35	2300	6	NO	12	NO	NO	Y	YES	3	NO	PASS	PASS	PASS	REFER	REFER	PASS	PASS	PASS	PASS
208	11	F	692531	H	NO	N	NO	N	NO	NO	34	1800	5	NO	6	NO	YES	NIL	N	3	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
209	10	M	693641	G	NO	A	NO	N	NO	NO	29	1650	6	NO	3	NO	YES	NIL	YES	14	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
210	9	F	693624	H	NO	N	NO	A	NO	NO	34	2000	4	NO	3	NO	NO	NIL	YES	6	NO	PASS	PASS	PASS	REFER	REFER	PASS	REFER	PASS	PASS
211	7	F	694756	H	YES	N	NO	A	NO	NO	34	2100	7	NO	6	NO	NO	NIL	N	13	NO	REFER	REFER	REFER	REFER	REFER	PASS	PASS	PASS	REFER
212	8	F	692025	H	NO	N	NO	L	NO	NO	38	3000	4	NO	2	NO	NO	Y	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
213	5	F	603676	H	NO	A	NO	N	NO	YES	37	3000	4	NO	5	NO	NO	YES	N	38	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
214	14	M	690322	H	NO	N	NO	N	NO	YES	32	2200	3	NO	7	NO	NO	NIL	N	20	NO	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS
215	18	M	695757	H	YES	A	NO	N	NO	NO	26	1500	5	NO	10	NO	NO	NIL	N	10	NO	REFER	PASS	REFER	REFER	PASS	REFER	REFER	PASS	REFER
216	5	M	693803	G	NO	N	NO	L	NO	NO	28	1900	6	NO	8	NO	YES	NIL	N	16	NO	REFER	PASS	REFER	REFER	PASS	REFER	REFER	REFER	REFER
217	7	F	693033	H	NO	HT	NO	N	NO	YES	36	2800	4	NO	5	NO	NO	Y	YES	10	NO	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER	REFER
218	8	F	68463	G	NO	N	NO	L	NO	NO	36	2000	5	NO	9	NO	YES	NIL	N	6	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
219	10	M	683930	G	NO	N	NO	A	NO	YES	38	2900	6	NO	11	NO	YES	NIL	YES	4	NO	PASS	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS
220	11	F	680595	H	NO	A	NO	L	NO	NO	31	1800	5	NO	2	NO	YES	Y	YES	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
221	6	M	689876	H	NO	A	NO	L	YES	NO	30	1900	8	NO	5	NO	NO	NIL	YES	4	NO	REFER	PASS	REFER	REFER	PASS	REFER	REFER	REFER	REFER
222	8	M	689970	G	NO	A	NO	N	NO	NO	27	1200	8	NO	7	NO	NO	NIL	N	10	NO	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
223	5	M	684535	G	YES	A	NO	N	NO	NO	29	1500	4	NO	10	NO	YES	NIL	N	11	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
224	10	F	684756	H	NO	N	NO	N	NO	NO	34	2100	7	NO	8	NO	YES	Y	N	6	NO	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
225	5	F	690011	H	NO	A	NO	N	NO	YES	28	1100	4	NO	10	NO	NO	Y	N	12	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
226	8	F	682911	H	NO	N	NO	L	NO	NO	39	2900	7	NO	14	NO	NO	Y	YES	18	NO	REFER	REFER	REFER	REFER	REFER	PASS	PASS	PASS	REFER
227	9	M	683522	H	NO	A	NO	L	NO	YES	28	1200	5	NO	5	YES	NO	NIL	N	2	NO	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
228	11	M	681121	H	YES	A	NO	A	NO	NO	27	1700	7	NO	6	NO	YES	Y	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
229	11	F	683321	H	NO	N	NO	L	NO	NO	38	3000	7	NO	4	NO	NO	Y	YES	8	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
230	16	M	685941	H	NO	HT	NO	N	YES	NO	34	1900	9	NO	2	YES	NO	NIL	N	2	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
231	7	M	684943	H	NO	N	NO	N	NO	NO	35	2500	9	NO	9	NO	YES		N	5	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	PASS	PASS
232	8	M	684932	H	NO	PR	NO	N	NO	NO	32	2000	9	NO	6	NO	NO		N	7	NO	PASS	PASS	PASS	PASS	PASS	REFER	REFER	PASS	PASS
233	5	M	684932	I	NO	N	NO	L	NO	NO	38	3300	9	NO	7	NO	NO	NIL	YES	10	NO	REFER	PASS	REFER	PASS	REFER	PASS	REFER	PASS	PASS
234	20	F	689430	H	NO	A	NO	N	NO	NO	32	1600	8	NO	4	NO	NO	Y	N	6	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
235	7	F	684900	H	NO	A	NO	A	NO	NO	35	2200	7	NO	4	NO	YES	YES	N	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
236	6	M	685940	H	NO	N	NO	N	NO	NO	35	2400	6	NO	3	NO	YES	NIL	YES	9	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
237	7	M	689453	H	NO	A	NO	N	NO	NO	36	2100	7	NO	11	NO	YES	NIL	YES	16	NO	PASS	REFER	PASS	REFER	REFER	NOISY	REFER	REFER	REFER
238	4	M	689012	H	NO	A	NO	L	NO	NO	34	2500	8	NO	6	NO	NO	NIL	N	9	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
239	9	M	654099	G	NO	N	NO	L	NO	YES	36	2100	4	NO	9	NO	YES	Y	N	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
240	12	F	675443	H	YES	N	NO	L	NO	NO	36	2900	9	NO	4	NO	YES	NIL	N	6	NO	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
241	7	F	684121	G	NO	A	NO	A	NO	NO	32	1900	9	NO	12	NO	NO	NIL	N	12	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
242	8	M	685711	H	YES	N	NO	N	NO	NO	35	2700	6	NO	8	NO	YES	Y	N	18	NO	REFER	PASS	REFER	REFER	PASS	REFER	PASS	PASS	PASS
243	11	M	686744	G	NO	N	NO	N	NO	YES	37	3000	3	NO	5	NO	YES	NIL	N	2	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
244	19	M	685945	H	NO	N	NO	L	NO	NO	38	3100	7	NO	9	YES	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS	PASS
245	16	F	690115	G	NO	N	NO	L	NO	NO	32	2800	7	NO	7	YES	NO	NIL	N	8	NO	PASS	PASS	REFER	PASS	PASS	REFER	PASS	PASS	PASS
246	8	M	690332	H	NO	A	NO	A	NO	NO	36	2800	7	NO	5	NO	NO	Y	N	2	NO	PASS	PASS	REFER	PASS	REFER	REFER	PASS	PASS	PASS
247	9	F	690112	G	NO	A	NO	N	NO	NO	32	1600	7	NO	3	NO	NO	Y	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
248	5	M	695223	H	NO	N	NO	N	NO	YES	35	2700	3	NO	4	NO	YES	Y	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
249	6	F	684734	H	NO	A	NO	N	NO	NO	28	1700	5	NO	4	YES	YES	NIL	YES	10	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
250	7	F	673213	H	NO	N	NO	N	NO	NO	35	2000	6	NO	7	NO	NO	Y	YES	6	NO	REFER	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
251	9	M	694632	H	NO	HT	NO	L	NO	NO	38	2800	6	NO	3	NO	YES	Y	N	16	NO	REFER	PASS	REFER	REFER	PASS	PASS	REFER	REFER	REFER
252	4	M	569987	H	NO	N	NO	L	NO	NO	36	2000	8	NO	4	NO	YES	NIL	N	9	NO	REFER	PASS	REFER	PASS	REFER	PASS	REFER	PASS	PASS
253	11	F	696977	H	NO	N	NO	N	NO	NO	36	2200	8	NO	12	NO	NO	NIL	N	16	NO	REFER	PASS	REFER	REFER	REFER	REFER	REFER	PASS	REFER
254	18	M	690364	H	NO	N	NO	N	NO	NO	34	1700	8	NO	6	NO	NO	NIL	N	6	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
255	2	F	699505	H	NO	A	NO	N	NO	NO	36	1600	8	NO	3	NO	NO	NIL	N	3	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
256	20	F	6090078	H	NO	N	NO	A	NO	NO	37	1900	9	NO	3	NO	NO	NIL	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
257	11	M	695505	H	YES	A	NO	N	NO	NO	38	2000	8	NO	6	YES	NO	Y	YES	3	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
258	8	F	697621	G	NO	A,I	NO	N	NO	YES	34	1800	2	NO	2	NO	NO	NIL	N	3	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
259	12	F	694562	H	NO	A	NO	N	NO	NO	29	1700	8	NO	5	NO	YES	NIL	YES	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
260	17	F	690033	H	NO	N	NO	L	NO	NO	36	2500	5	NO	7	NO	NO	Y	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
261	19	F	605933	G	NO	N	NO	N	NO	NO	34	1700	5	NO	10	NO	YES	Y	YES	2	NO	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
262	5	M	690043	H	NO	HT	NO	L	NO	NO	30	1800	6	NO	8	NO	YES	NIL	N	6	NO	REFER	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS
263	8	F	699943	G	NO	I	NO	N	NO	NO	34	1800	2	NO	5	NO	YES	NIL	N	9	NO	PASS	REFER	PASS	REFER	PASS	REFER	PASS	PASS	PASS
264	9	M	609155	H	YES	A	YES	L	NO	NO	37	2000	9	NO	14	NO	YES	NIL	YES	5	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	REFER	REFER
265	4	F	685858	H	YES	A	NO	N	NO	NO	31	1890	9	NO	10	NO	NO	NIL	N	11	NO	PASS	REFER	PASS	REFER	PASS	REFER	REFER	REFER	REFER
266	6	F	688997	G	NO	I	NO	L	NO	NO	40	3800	5	NO	14	NO	YES	NIL	N	22	NO	REFER	REFER	REFER	REFER	PASS	PASS	REFER	REFER	REFER
267	7	M	696966	G	NO	A	NO	N	NO	YES	30	1500	3	NO	5	YES	YES	NIL	N	3	NO	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
268	5	M	699097	H	NO	N	NO	L	NO	NO	37	2900	7	NO	6	NO	NO	Y	YES	3	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS

SR.NO	Age	SEX	OP/IP NUMBER	EDUCATION	CONSANGUOS MARRIAGE	ANC	FAMILY H/O DEAFNESS	MODE OF DELIVERY	TORCH INFECTION	MEDICATION	GESTATIONAL AGE IN WKS	BIRTH WEIGHT GMS	APGAR SCORE	CRANIOFACIAL ANOMALY	HYPERBILIRUBINEMIA	NEUROLOGICAL FACTORS	INFECTION	AMINO. INJ	MECH VENTI	TOTAL DAYS I NICU	ASSO. SYND	6000R	6000L	4000R	4000L	3000R	3000L	2000R	2000L	FINAL RESULT
269	6	M	699066	H	NO	N	NO	N	NO	NO	33	2000	7	NO	4	NO	NO	NIL	N	6	NO	PASS	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS
270	3	M	693212	H	NO	A	NO	L	NO	NO	35	2200	6	NO	9	NO	NO	Y	N	12	NO	PASS	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS
271	10	M	696964	H	NO	A	NO	N	NO	NO	36	2000	9	NO	9	NO	YES	Y	YES	20	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
272	10	M	693524	G	NO	N	NO	N	NO	NO	33	2100	7	NO	11	NO	NO	Y	N	22	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
273	1	F	695634	G	NO	A	NO	L	NO	NO	28	1700	7	NO	7	NO	NO	NIL	N	12	NO	PASS	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS
274	2	F	700554	G	NO	A	NO	L	NO	NO	28	1400	6	NO	4	NO	YES	Y	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS
275	3	M	700021	H	NO	A,I	NO	N	NO	YES	32	1100	3	NO	4	NO	NO	YES	YES	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
276	11	M	700012	H	NO	N	NO	L	NO	NO	36	2100	8	NO	3	NO	NO	NIL	YES	4	NO	PASS	REFER	PASS	REFER	PASS	REFER	PASS	PASS	PASS
277	10	M	700045	H	YES	A	NO	A	NO	NO	28	1400	4	NO	11	NO	NO	NIL	YES	14	NO	REFER	REFER	REFER	REFER	REFER	REFER	PASS	PASS	REFER
278	9	F	699232	H	NO	N	NO	N	NO	NO	36	2300	4	NO	6	NO	YES	NIL	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
279	33	F	696050	G	NO	N	NO	N	NO	NO	28	1900	7	NO	9	NO	YES	Y	YES	10	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	PASS	REFER
280	9	M	700404	G	NO	A	NO	A	NO	NO	25	1200	7	NO	4	YES	YES	NIL	YES	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
281	9	F	700021	H	NO	N	NO	L	NO	NO	38	2500	7	NO	12	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
282	12	M	700050	H	NO	A	NO	N	NO	NO	28	1400	3	NO	8	NO	YES	Y	YES	3	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
283	10	M	69600	H	NO	N	NO	N	NO	NO	36	2700	7	NO	5	NO	YES	NIL	YES	3	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
284	6	M	700061	H	NO	A	NO	N	NO	YES	31	1900	3	NO	9	NO	NO	NIL	N	14	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
285	2	F	690034	H	NO	N	NO	N	NO	NO	34	2200	5	NO	7	NO	YES	NIL	N	6	NO	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
286	6	F	699998	H	YES	N	YES	L	NO	NO	40	2900	7	NO	5	NO	YES	YES	N	13	NO	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS	PASS
287	6	F	699055	G	NO	HT	NO	L	NO	NO	34	2600	8	NO	3	NO	NO	Y	N	7	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
288	9	M	600595	G	NO	HT,A	NO	L	NO	NO	24	1100	8	NO	4	NO	NO	Y	YES	38	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
289	5	M	700561	G	NO	N	NO	N	NO	NO	36	2100	8	NO	4	NO	NO	NIL	YES	20	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
290	4	F	700776	G	NO	A	NO	N	NO	NO	35	2000	6	NO	7	NO	NO	Y	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
291	6	M	690555	H	NO	N	NO	L	NO	NO	37	2800	6	NO	3	NO	YES	Y	YES	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
292	5	M	699995	H	NO	A	NO	N	NO	NO	31	1650	6	NO	4	NO	YES	NIL	YES	10	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
293	8	M	699934	H	NO	N	NO	N	NO	YES	38	3000	3	NO	7	NO	NO	Y	N	6	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
294	9	M	699675	H	NO	A	NO	A	NO	NO	36	2500	7	NO	14	YES	YES	Y	N	4	NO	PASS	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER
295	2	F	669743	G	NO	A	NO	N	NO	NO	38	2300	7	NO	3	NO	YES	NIL	N	4	NO	PASS	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER
296	11	F	698770	G	NO	N	NO	A	NO	NO	37	2700	9	NO	3	NO	NO	NIL	N	4	NO	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
297	9	M	699950	G	NO	A	NO	N	NO	NO	35	1900	7	NO	6	NO	NO	NIL	N	10	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
298	22	M	699324	G	NO	A	NO	N	NO	NO	30	1200	3	NO	2	NO	NO	NIL	N	11	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
299	8	M	699453	G	NO	A	NO	A	NO	NO	34	2000	5	NO	5	NO	NO	Y	YES	6	NO	PASS	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
300	9	M	700012	H	NO	A	NO	L	NO	NO	32	1400	5	NO	7	NO	NO	NIL	N	12	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
301	3	F	699354	H	NO	N	NO	L	NO	NO	36	2700	8	NO	10	YES	NO	NIL	YES	18	NO	PASS	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER
302	5	F	699967	H	NO	HT	NO	N	NO	NO	36	2300	7	NO	8	NO	YES	Y	YES	2	NO	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS
303	8	M	698576	H	NO	N	NO	N	NO	YES	32	1900	3	NO	5	NO	NO	Y	YES	4	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	PASS	REFER
304	2	M	696867	H	YES	N	NO	N	NO	NO	35	2100	9	NO	9	NO	YES	NIL	N	8	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
305	5	M	687465	H	NO	N	NO	N	NO	NO	37	2000	8	NO	11	NO	YES	NIL	YES	2	NO	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER	REFER
306	9	F	697008	H	NO	I	NO	L	NO	YES	38	2500	4	NO	5	NO	YES	NIL	YES	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
307	3	M	700584	H	NO	N	NO	N	NO	NO	36	2400	6	NO	9	NO	YES	NIL	N	7	NO	PASS	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS
308	5	F	699505	H	NO	A	NO	A	NO	NO	24	1500	6	NO	7	NO	NO	NIL	YES	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
309	6	M	700575	H	NO	A	NO	N	NO	NO	32	1400	4	NO	5	NO	YES	NIL	YES	6	NO	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
310	6	F	690056	H	NO	N	NO	N	NO	NO	36	2200	8	NO	3	NO	YES	Y	N	16	NO	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
311	3	F	699077	H	NO	N	NO	N	NO	NO	32	2300	8	NO	4	YES	NO	NIL	N	9	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
312	2	M	609005	H	NO	A,I	NO	L	NO	NO	35	2100	3	NO	4	YES	NO	Y	N	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
313	4	M	690779	G	NO	N	NO	N	NO	NO	38	2600	4	NO	7	NO	NO	Y	N	9	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
314	6	F	689008	G	NO	HT	NO	N	NO	NO	36	2700	4	NO	3	NO	YES	Y	YES	6	NO	REFER	REFER	REFER	REFER	PASS	PASS	PASS	PASS	PASS
315	12	M	696952	G	NO	I	NO	A	NO	NO	34	2200	6	NO	4	NO	NO	Y	YES	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
316	20	F	690214	G	NO	I	NO	L	NO	NO	36	1900	3	NO	12	NO	NO	Y	N	20	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
317	6	F	690112	G	YES	N	NO	L	NO	NO	36	2100	8	NO	6	NO	YES	Y	YES	22	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	REFER	PASS
318	7	M	695055	H	NO	A	NO	L	NO	NO	29	1700	8	NO	3	NO	NO	Y	YES	12	NO	REFER	REFER	REFER	REFER	REFER	PASS	PASS	PASS	REFER
319	3	F	706065	H	NO	N	NO	N	NO	NO	35	2100	8	NO	3	NO	NO	NIL	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS	PASS
320	4	F	694043	H	NO	I	NO	N	NO	NO	37	2600	7	NO	6	NO	NO	Y	N	7	NO	PASS	PASS	PASS	PASS	PASS	REFER	REFER	REFER	PASS
321	9	F	685755	G	YES	N	NO	N	NO	NO	38	3000	8	NO	2	NO	YES	YES	N	4	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
322	5	F	696777	G	NO	N	NO	N	NO	NO	32	2000	8	NO	5	NO	YES	NIL	N	14	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
323	11	M	690004	G	NO	A	NO	N	NO	NO	36	2300	6	NO	7	NO	YES	NIL	N	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
324	6	F	700021	G	NO	I	NO	N	NO	NO	32	1300	4	NO	4	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
325	7	M	696846	H	YES	HT	NO	L	NO	NO	35	1900	7	NO	8	YES	YES	Y	YES	10	YES	PASS	REFER	PASS	REFER	PASS	PASS	REFER	REFER	PASS
326	10	F	692522	H	NO	A	NO	N	NO	NO	28	1200	7	NO	5	YES	YES	NIL	N	4	NO	REFER	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
327	8	F	700012	H	NO	N	NO	A	NO	NO	36	2200	4	NO	9	NO	NO	NIL	YES	3	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
328	7	M	700475	H	NO	A	NO	N	NO	NO	38	2100	7	NO	11	NO	YES	Y	YES	13	NO	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
329	5	M	638200	H	NO	N	NO	N	NO	NO	36	2700	8	NO	2	NO	YES	NIL	YES	14	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
330	9	M	695833	G	NO	N	NO	N	NO	NO	36	2000	8	NO	5	NO	NO	NIL	N	6	NO	REFER	PASS	REFER	REFER	PASS	REFER	PASS	PASS	PASS
331	5	M	602926	G	NO	N	NO	N	NO	NO	34	1800	8	NO	7	NO	NO	NIL	YES	13	NO	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
332	9	F	6936234	G	NO	I,A	NO	N	NO	NO	36	1700	8	NO	10	NO	NO	Y	YES	14	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS	PASS
333	6	M	693523	G	NO	A	NO	N	NO	NO	37	2000	8	NO	8	NO	NO	Y	YES	19	NO	REFER	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER
334	4	M	700363	H	NO	I,A	NO	N	NO	NO	38	1500	8	NO	5	NO	YES	Y	N	20	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
335	11	M	700573	H	NO	N	NO	N	NO	NO	34	2100	6	NO	9	YES	YES	NIL	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

SR.NO	Age	SEX	OP/IP NUMBER	EDUCATION	CONSANGUOS MARRIAGE	ANC	FAMILY H/O DEAFNESS	MODE OF DELIVERY	TORCH INFECTION	MEDICATION	GESTATIONAL AGE IN WKS	BIRTH WEIGHT GMS	APGAR SCORE	CRANIOFACIAL ANOMALY	HYPERBILIRUBINEMIA	NEUROLOGICAL FACTORS	INFECTION	AMINO. INJ	MECH VENTI	TOTAL DAYS I NICU	ASSO. SYND	6000R	6000L	4000R	4000L	3000R	3000L	2000R	2000L	FINAL RESULT
336	6	M	691004	H	NO	A	NO	L	NO	NO	29	1500	5	NO	11	NO	NO	Y	N	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
337	7	F	699992	G	NO	N	NO	L	NO	NO	36	3000	8	NO	6	NO	YES	Y	YES	10	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
338	9	F	655499	H	NO	HT	NO	L	NO	NO	34	2800	8	NO	10	NO	YES	NIL	N	6	NO	REFER	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
339	17	M	697011	G	NO	A	NO	N	NO	NO	30	1500	5	NO	14	NO	NO	Y	N	4	NO	REFER	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
340	12	M	691034	G	NO	PR	NO	L	NO	NO	36	2700	7	NO	5	NO	NO	Y	YES	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
341	17	M	692014	H	NO	N	NO	N	NO	NO	37	2900	8	NO	6	NO	NO	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
342	12	F	60194	H	YES	A	NO	N	YES	NO	31	1600	8	Y	4	NO	NO	NIL	N	10	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
343	9	M	693024	H	NO	I	NO	L	NO	YES	40	3300	4	NO	10	NO	NO	NIL	N	11	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
344	8	F	700013	H	NO	N	NO	N	NO	NO	30	2100	8	NO	9	NO	NO	NIL	YES	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	NOISY	PASS	PASS
345	7	M	700089	H	NO	N	NO	N	NO	NO	37	2800	8	NO	6	NO	YES	Y	N	12	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
346	7	F	699261	H	NO	A	NO	N	NO	NO	33	1900	4	NO	7	NO	NO	NIL	N	18	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
347	22	F	691613	H	NO	N	NO	L	NO	NO	35	3000	7	NO	4	NO	YES	NIL	YES	2	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	REFER	PASS
348	10	M	691423	H	NO	N	NO	L	NO	NO	36	2200	8	NO	4	NO	YES	Y	YES	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	REFER	REFER	PASS
349	7	M	699985	H	NO	I	NO	L	NO	NO	37	2400	5	NO	3	YES	YES	Y	N	8	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
350	7	F	699685	H	NO	HT	NO	N	NO	NO	28	1700	8	NO	11	NO	NO	NIL	N	4	NO	REFER	PASS	PASS	REFER	PASS	PASS	PASS	REFER	REFER
351	21	M	695055	H	NO	A	NO	N	NO	NO	28	1550	6	NO	6	NO	NO	NIL	N	3	NO	PASS	REFER	PASS	REFER	PASS	REFER	REFER	REFER	REFER
352	9	F	629999	H	NO	I	NO	N	NO	NO	37	2700	6	NO	9	NO	YES	NIL	N	3	NO	PASS	PASS	PASS	PASS	REFER	REFER	REFER	REFER	PASS
353	9	F	699373	H	NO	A	NO	N	NO	NO	32	1900	8	NO	4	NO	YES	NIL	N	14	NO	PASS	REFER	PASS	REFER	PASS	REFER	REFER	REFER	PASS
354	6	M	690433	H	NO	N	NO	N	NO	NO	33	2000	8	NO	12	NO	NO	NIL	N	6	NO	REFER	REFER	REFER	REFER	PASS	PASS	REFER	REFER	REFER
355	10	F	604437	H	NO	A	NO	N	NO	NO	30	1600	8	NO	8	NO	NO	NIL	N	13	NO	PASS	PASS	REFER	REFER	REFER	REFER	REFER	PASS	REFER
356	1	F	699888	H	NO	A	NO	N	NO	NO	28	1100	8	NO	5	NO	NO	Y	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
357	2	F	699999	H	NO	N	NO	N	NO	NO	35	2400	4	NO	9	NO	YES	NIL	N	38	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
358	3	F	702020	H	NO	A	NO	N	NO	NO	29	1200	3	NO	7	NO	NO	Y	N	20	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
359	11	M	700234	H	NO	A	NO	N	NO	NO	28	1400	7	NO	5	NO	NO	Y	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
360	10	F	694532	H	NO	N	NO	N	NO	NO	39	3000	7	NO	3	NO	YES	Y	YES	16	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
361	9	M	694043	H	NO	N	NO	N	NO	NO	32	2100	7	NO	4	YES	NO	NIL	YES	10	NO	PASS	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS
362	33	F	694044	G	YES	N	NO	L	NO	NO	37	2700	3	NO	4	NO	NO	Y	N	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	REFER	PASS
363	9	F	694032	H	NO	A	NO	N	NO	NO	29	1000	3	NO	7	NO	NO	YES	N	4	NO	REFER	REFER	REFER	REFER	PASS	PASS	PASS	PASS	PASS
364	9	M	700012	G	NO	N	NO	N	YES	NO	36	2800	5	NO	3	NO	YES	NIL	N	4	NO	PASS	REFER	PASS	REFER	PASS	REFER	RR	REFER	REFER
365	12	M	770058	G	NO	PR	NO	N	NO	NO	30	2000	8	NO	4	NO	YES	NIL	N	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
366	10	M	686975	H	NO	N	NO	L	NO	NO	38	3100	6	NO	12	NO	YES	NIL	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
367	6	M	686595	H	NO	A	NO	N	NO	NO	29	1400	7	NO	6	NO	NO	Y	N	11	NO	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS
368	2	M	699987	H	NO	N	NO	N	NO	NO	34	2000	7	NO	3	NO	YES	NIL	YES	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
369	6	M	699995	H	NO	A	NO	N	NO	NO	36	2600	5	NO	3	NO	YES	NIL	N	12	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
370	6	F	694043	G	NO	A	NO	N	NO	NO	32	1600	5	NO	6	NO	NO	Y	YES	18	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
371	9	F	697066	H	NO	N	NO	L	NO	NO	33	2000	7	NO	2	NO	YES	NIL	N	2	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
372	5	F	694044	H	NO	N	NO	N	NO	NO	37	2300	7	NO	5	YES	YES	NIL	YES	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
373	4	M	695050	H	NO	N	NO	N	NO	NO	36	2100	7	NO	7	NO	NO	NIL	N	8	NO	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
374	6	M	699521	G	NO	A	NO	L	NO	YES	34	1900	3	NO	10	NO	NO	Y	N	2	NO	PASS	PASS	REFER	PASS	PASS	PASS	REFER	PASS	PASS
375	5	M	693521	G	NO	N	NO	N	NO	NO	34	2800	5	NO	8	NO	NO	Y	YES	5	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
376	8	F	694034	H	NO	N	NO	L	NO	NO	38	2800	7	NO	5	YES	NO	Y	N	7	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
377	9	M	695050	H	NO	A	NO	N	NO	YES	29	1100	4	NO	14	NO	YES	NIL	N	10	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
378	2	F	691101	H	NO	N	NO	L	NO	NO	37	3000	8	NO	10	YES	YES	Y	N	6	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
379	11	M	700052	H	NO	A	NO	N	NO	NO	28	1200	4	NO	14	NO	NO	Y	YES	16	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
380	8	F	700564	H	NO	A	NO	N	NO	NO	35	2000	4	NO	5	NO	YES	NIL	N	9	NO	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
381	22	M	693634	G	NO	N	NO	N	NO	NO	34	1900	8	NO	6	NO	YES	NIL	N	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
382	8	M	710101	G	NO	I	NO	N	NO	NO	35	2000	6	NO	4	NO	NO	Y	YES	9	NO	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
383	9	F	700035	G	NO	HT,A	NO	N	NO	NO	28	1700	7	NO	10	YES	NO	Y	N	16	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
384	3	M	704944	H	NO	I	NO	N	NO	NO	37	2600	4	NO	9	NO	NO	Y	N	6	NO	REFER	PASS	REFER	PASS	PASS	PASS	PASS	PASS	PASS
385	5	M	693624	H	NO	N	NO	N	NO	NO	34	2200	7	NO	6	NO	NO	NIL	N	12	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
386	8	F	700098	H	NO	I	NO	N	NO	NO	36	2700	7	NO	7	NO	NO	Y	YES	18	NO	PASS	PASS	PASS	REFER	REFER	PASS	REFER	PASS	PASS
387	2	F	70065	H	NO	A	NO	N	NO	NO	28	1500	5	NO	4	NO	NO	Y	YES	2	NO	PASS	PASS	REFER	REFER	REFER	REFER	REFER	REFER	REFER
388	5	M	700354	G	NO	N	NO	N	NO	NO	36	2300	7	NO	4	NO	YES	NIL	YES	4	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
389	9	F	699650	G	NO	I	NO	N	NO	NO	35	2000	7	NO	3	NO	NO	Y	N	8	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
390	3	F	710102	H	NO	A	NO	N	NO	NO	36	2000	8	NO	11	NO	YES	Y	YES	2	NO	PASS	PASS	PASS	PASS	REFER	PASS	PASS	PASS	PASS
391	5	F	704634	H	NO	N	NO	N	NO	NO	34	2100	8	NO	6	NO	YES	Y	YES	5	NO	REFER	PASS	PASS	REFER	PASS	PASS	PASS	PASS	PASS
392	6	F	704944	G	NO	N	NO	N	NO	NO	36	2200	7	NO	9	NO	YES	NIL	N	7	NO	PASS	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
393	6	M	705858	H	NO	HT	YES	N	NO	NO	37	3000	8	NO	4	NO	YES	YES	YES	10	NO	REFER	REFER	REFER	REFER	REFER	PASS	REFER	REFER	REFER
394	3	F	704343	H	YES	I	NO	N	NO	NO	36	2600	7	NO	12	NO	NO	Y	YES	15	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER	REFER
395	2	M	695044	G	NO	HT,A	NO	L	NO	YES	29	1100	3	NO	8	NO	YES	NIL	N	16	NO	PASS	REFER	REFER	REFER	REFER	PASS	PASS	PASS	PASS
396	4	M	704104	G	NO	A	NO	N	NO	NO	35	2400	9	NO	5	NO	YES	NIL	N	9	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
397	6	F	710132	G	NO	I	NO	N	NO	NO	37	2300	4	NO	9	NO	NO	Y	N	16	NO	REFER	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS
398	12	M	745454	G	NO	N	NO	N	NO	NO	38	2600	5	NO	7	NO	NO	Y	N	6	NO	PASS	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS
399	20	F	703032	G	NO	A	NO	N	NO	NO	32	2000	8	NO	5	NO	NO	Y	YES	3	NO	REFER	REFER	REFER	REFER	REFER	REFER	REFER	PASS	REFER
400	6	F	703931	G	NO	N	NO	N	NO	NO	36	3000	6	NO	3	NO	YES	NIL	YES	5	NO	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
401	7	F	705045	G	NO	A	NO	L	NO	NO	32	2300	8	NO	4	NO	NO	Y	N	3	NO	REFER	REFER	PASS	PASS	PASS	PASS	PASS	PASS	PASS
402	3	F	707075	G	NO	N	NO	N	NO	NO	35	2800	5	NO	4	NO	NO	Y	YES	3	NO	REFER	REFER	REFER	REFER	PASS	PASS	PASS	PASS	PASS

Serial Number	In Patient Number	Date of Birth	Date of Screening	Sex	Age(Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes																Final Impression	Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
									Otatoacoustic emission test																					
									First								Second													
									Left				Right				Left				Right									
									2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000						
1	461580	12.12.12	12.12.12	M	6	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	Yes- AN
2	457246	21.07.12	24.07.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	7	No	Yes- AN
3	457948	23.07.12	26.07.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	9	No	Yes-HT
4	457496	30.08.12	02.09.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	No
5	457697	01.09.12	06.09.12	M	6	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	9	No	Yes- AN
6	458500	31.08.12	04.09.12	M	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	7	No	No
7	489170	05.09.12	06.09.12	F	2	+	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2600	10	No	Yes- AN
8	458344	03.09.12	06.09.12	M	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	9	No	Yes -HT
9	458280	04.09.12	06.09.12	M	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3100	8	No	No
10	457937	02.09.12	06.09.12	M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	Yes- AN
11	458436	04.09.12	06.09.12	F	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3000	7	No	No
12	458361	04.09.12	06.09.12	M	3	-	-	ND	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	37	2800	7	No	Yes- AN
13	458496	03.09.12	06.09.12	M	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	3100	8	No	No
14	457862	07.10.12	06.09.12	F	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	10	No	Yes -HT
15	458511	08.10.12	06.09.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	9	No	No
16	457845	07.10.12	06.09.12	M	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	7	No	Yes-HT
17	456342	08.10.12	06.09.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	9	No	No
18	457983	09.10.12	06.09.12	M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	Yes- AN
19	458356	08.10.12	06.09.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	9	No	No
20	458328	07.10.12	06.09.12	F	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3000	10	No	Yes-HT
21	458317	08.10.12	06.09.12	F	4	-	-	ND	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	37	2800	7	No	No
22	458443	09.10.12	06.09.12	M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	9	No	Yes-AN
23	458446	08.10.12	06.09.12	F	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2900	8	No	No
24	458636	07.10.12	06.09.12	M	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2900	9	No	No
25	458820	08.10.12	06.09.12	M	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	7	No	Yes-AN
26	458933	09.10.12	06.09.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2600	10	No	Yes- AN

Serial Number	In Patient Number	Date of Birth	Date of Screening	Sex	Age(Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes																Final Impression	Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
									Otatoacoustic emission test																					
									First								Second													
									Left				Right				Left				Right									
									2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000						
27	459451	06.10.12	06.09.12	M	6	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	9	No	No
28	459288	07.10.12	06.09.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	7	No	No
29	459456	20.11.12	22.11.12	M	3	+	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	NO
30	459633	19.11.12	22.11.12	M	4	-	-	ND	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	38	2700	7	No	No
31	459437	18.11.12	22.11.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2600	8	No	Yes- AN
32	459403	19.11.12	22.11.12	F	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	9	No	NO
33	459411	18.11.12	22.11.12	M	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	9	No	NO
34	459385	20.11.12	22.11.12	M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2700	8	No	No
35	460601	19.11.12	22.11.12	F	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	10	No	No
36	461198	18.11.12	22.11.12	M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	9	No	Yes- AN
37	469353	19.11.12	22.11.12	M	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	8	No	NO
38	561452	20.11.12	22.11.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2600	8	No	Yes- AN
39	461510	19.11.12	22.11.12	F	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2900	9	No	No
40	461418	17.11.12	22.11.12	M	6	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2600	8	No	No
41	461533	18.11.12	22.11.12	F	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	9	No	Yes -HT
42	4615112	19.11.12	22.11.12	M	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	10	No	Yes- AN
43	461584	18.11.12	22.11.12	M	5	+	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	9	No	No
44	461519	30.11.12	06.12.12	F	7	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3000	9	No	Yes -HT
45	459669	01.12.12	06.12.12	M	6	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	No
46	459706	02.12.12	06.12.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	No
47	459948	02.12.12	06.12.12	M	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	10	No	No
48	459945	01.12.12	06.12.12	M	6	+	-	ND	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	38	2700	7	No	Yes- AN
49	459920	03.12.12	06.12.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
50	459921	02.12.12	06.12.12	M	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	9	No	No
51	459962	03.12.12	06.12.12	M	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	NO
52	460016	04.12.12	06.12.12	M	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	9	No	No

Serial Number	In Patient Number	Date of Birth	Date of Screening	Sex	Age(Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes																Final Impression	Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
									Otatoacoustic emission test																					
									First								Second													
									Left				Right				Left				Right									
									2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000						
53	460374	03.12.12	06.12.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	Yes- AN
54	460360	02.12.12	06.12.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2700	9	No	NO
55	460318	03.12.12	06.12.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	10	No	No
56	460317	01.12.12	06.12.12	F	6	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	8	No	Yes -HT
57	460298	03.12.12	06.12.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	NO
58	460236	02.12.12	06.12.12	M	5	+	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	Yes- AN
59	460296	23.12.12	27.12.12	F	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	8	No	No
60	460291	24.12.12	27.12.12	F	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2900	9	No	No
61	460281	25.12.12	27.12.12	M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	Yes- AN
62	460375	24.12.12	27.12.12	F	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	8	No	No
63	460341	23.12.12	27.12.12	M	5	-	-	ND	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	38	2900	7	No	Yes- AN
64	460398	24.12.12.	27.12.12	F	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	10	No	No
65	460485	23.12.12	27.12.12	M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	10	No	No
66	460759	24.12.12.	27.12.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
67	460825	25.12.12	27.12.12	F	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	8	No	No
68	461178	24.12.12	27.12.12	M	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
69	460970	23.12.12	27.12.12	F	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	8	No	No
70	461172	25.12.12	27.12.12	M	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	9	No	Yes- AN
71	461265	24.12.12	27.12.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	9	No	No
72	461734	23.12.12	27.12.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	NO
73	453099	02.01.12	09.01.12	M	8	-	+	ND	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	38	2700	7	No	Yes- AN
74	453167	12.12.12	17.12.12	F	6	+	-	ND	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	38	2800	7	No	No
75	453196	03.01.12	09.01.12	M	7	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	10	No	NO
76	453095	27.02.12	29.02.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	Yes- AN
77	453296	28.02.12	29.02.12	M	2	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2700	8	No	No
78	453354	28.02.12	29.02.12	F	2	-	-	ND	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	38	2600	7	No	Yes-AN

Serial Number	In Patient Number	Date of Birth	Date of Screening	Sex	Age(Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes																Final Impression	Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
									Otatoacoustic emission test																					
									First								Second													
									Left				Right				Left				Right									
									2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000						
79	453457	27.02.12	29.02.12	M	3	-	+	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
80	453880	07.03.12	07.03.12	F	1	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	10	No	Yes- AN
81	453821	04.03.12	07.03.12	M	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2600	9	No	NO
82	453993	05.03.12	07.03.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	No
83	453994	06.03.12	07.03.12	M	2	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	NO
84	454579	06.03.12	07.03.12	M	2	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	9	No	NO
85	454225	06.03.12	07.03.12	F	2	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2600	9	No	Yes- AN
86	454320	15.03.12	19.03.12	M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2700	8	No	NO
87	454297	18.03.12	19.03.12	F	2	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	9	No	Yes- AN
88	454295	18.03.12	19.03.12	M	2	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2400	10	No	No
89	454257	16.03.12	19.03.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2600	10	No	Yes- AN
90	454354	.14.03.12	19.03.12	M	6	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	8	No	No
91	454368	18.03.12	19.03.12	M	2	-	-	ND	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	38	2700	9	No	No
92	454429	17.03.12	19.03.12	M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	NO
93	455188	18.03.12	19.03.12	F	2	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2500	9	No	No
94	455287	15.03.12	19.03.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	Yes- AN
95	455900	18.03.12	19.03.12	M	2	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2900	8	No	No
96	455714	21.04.12	26.04.12	M	6	-	+	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	8	No	Yes -HT
97	45613	25.04.12	26.04.12	F	2	-	-	LSCS	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	39	2900	7	No	NO
98	457085	21.04.12	26.04.12	M	6	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	9	No	No
99	457114	24.04.12	26.04.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2600	9	No	NO
100	457087	23.04.12	26.04.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2300	8	No	No
101	457136	25.04.12	26.04.12	F	2	-	-	ND	R	R	R	R	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	Yes- AN
102	457227	24.04.12	26.04.12	F	3	-	+	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	9	No	NO
103	457502	20.04.12	26.04.12	M	7	+	-	ND	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	37	2600	7	No	Yes- AN
104	457095	23.04.12	26.04.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	10	No	NO

Serial Number	In Patient Number	Date of Birth	Date of Screening	Sex	Age(Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes																Final Impression	Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
									Otatoacoustic emission test																					
									First								Second													
									Left				Right				Left				Right									
									2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000						
105	457179	24.04.12	26.04.12	M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	10	No	No
106	457496	13.05.12	17.05.12	F	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	9	No	Yes -HT
107	457163	16.05.12	17.05.12	M	2	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2400	9	No	No
108	457147	12.05.12	17.05.12	M	6	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	8	No	Yes-AN
109	457078	15.05.12	17.05.12	F	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	3000	9	No	No
110	457204	16.05.12	17.05.12	M	2	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	9	No	No
111	457177	15.05.12	17.05.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	9	No	Yes- AN
112	457379	13.05.12	17.05.12	M	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2400	8	No	NO
113	457695	15.05.12	17.05.12	M	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	8	No	Yes -HT
114	457496	13.05.12	17.05.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	NO
115	457163	15.05.12	17.05.12	M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
116	457147	01.02.12	06.02.12	F	6	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	10	No	No
117	457078	24.07.12	26.07.12	M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2500	9	No	Yes- AN
118	457204	24.07.12	26.07.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	No
119	457177	24.07.12	26.07.12	M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	Yes- AN
120	457279	23.07.12	26.07.12	F	4	-	+	LSCS	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	39	3000	7	No	NO
121	457695	24.07.12	26.07.12	F	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2900	9	No	NO
122	457777	23.07.12	26.07.12	M	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
123	457761	22.07.12	26.07.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2400	8	No	Yes -HT
124	457744	24.07.12	26.07.12	M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2700	8	No	NO
125	457947	23.07.12	26.07.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2600	9	No	NO
126	457797	24.07.12	26.07.12	F	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	9	No	Yes -HT
127	457713	24.07.12	26.07.12	M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	10	No	Yes- AN
128	458068	25.07.12	26.07.12	F	2	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2200	8	No	No
129	457937	25.07.12	26.07.12	M	2	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	No
130	491902	11.09.12	13.09.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	9	No	NO

Serial Number	In Patient Number	Date of Birth	Date of Screening	Sex	Age(Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes																Final Impression	Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
									Otatoacoustic emission test																					
									First								Second													
									Left				Right				Left				Right									
									2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000						
131	491877	10.09.12	13.09.12	M	4	-	-	LSCS	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	39	3100	7	No	No
132	491808	10.09.12	13.09.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2200	9	No	NO
133	491644	10.09.12	13.09.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	10	No	No
134	490276	08.09.12	13.09.12	M	6	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	Yes- AN
135	492075	11.09.12	13.09.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2600	9	No	NO
136	491621	10.09.12	13.09.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	Yes-AN
137	49633	11.09.12	13.09.12	M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2400	9	No	No
138	491150	09.09.12	13.09.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	8	No	Yes -HT
139	491163	09.09.12	13.09.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2900	10	No	NO
140	498172	11.09.12	13.09.12	M	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	10	No	No
141	470327	21.04.12	26.04.12	F	6		-	ND	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	38	2700	9	No	Yes- AN
142	480458	21.04.12	26.04.12	F	6	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	10	No	No
143	470122	22.04.12	26.04.12	M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	Yes- AN
144	478695	21.04.12	26.04.12	F	6	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3000	9	No	No
145	472068	22.04.12	26.04.12	M	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	8	No	NO
146	470442	22.04.12	26.04.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
147	470039	24.04.12	26.04.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2300	9	No	Yes- AN
148	470092	22.04.12	26.04.12	M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	8	No	NO
149	470126	21.04.12	26.04.12	F	6	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	8	No	Yes -HT
150	469734	21.04.12	26.04.12	F	6	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	9	No	NO
151	469819	22.04.12	26.04.12	M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	10	No	No
152	469840	22.04.12	26.04.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	10	No	Yes- AN
153	469244	22.04.12	26.04.12	F	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	8	No	No
154	469317	22.04.12	26.04.12	M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
155	469820	24.04.12	26.04.12	M	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3000	9	No	No
156	469281	22.04.12	26.04.12	M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	Yes- AN

Serial Number	In Patient Number	Date of Birth	Date of Screening	Sex	Age(Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes																Final Impression	Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
									Otatoacoustic emission test																					
									First								Second													
									Left				Right				Left				Right									
									2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000						
157	469270	21.04.12	26.04.12	F	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	9	No	Yes -HT
158	469269	22.04.12	26.04.12	M	6	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2500	8	No	Yes- AN
159	469027	22.04.12	26.04.12	M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	9	No	NO
160	469031	22.01.12	26.04.12	F	5	-	-	ND	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	38	2700	7	No	No
161	463930	20.05.12	24.05.12	M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	9	No	No
162	463780	20.05.12	24.05.12	F	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	9	No	NO
163	463808	21.05.12	24.05.12	M	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	8	No	Yes -HT
164	464047	21.05.12	24.05.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	No
165	464034	21.05.12	24.05.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3000	10	No	ON
166	464076	21.05.12	24.05.12	F	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	9	No	No
167	464684	20.05.12	24.05.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2600	9	No	NO
168	464136	20.05.12	24.05.12	M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	10	No	Yes- AN
169	464136	21.05.12	24.05.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	8	No	No
170	464125	20.05.12	24.05.12	M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2600	9	No	Yes- AN
171	464158	20.05.12	24.05.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2900	9	No	No
172	464163	21.05.12	24.05.12	F	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	2600	8	No	NO
173	464168	21.05.12	24.05.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3000	9	No	No
174	464353	20.05.12	29.05.12	F	10	-	-	ND	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	38	2600	7	No	Yes- AN
175	464367	22.05.12	24.05.12	M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	9	No	No
176	464365	19.05.12	24.05.12	F	6	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	9	No	Yes-AN
177	464367	21.05.12	24.05.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2900	8	No	NO
178	464371	21.05.12	24.05.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	Yes- AN
179	464650	21.05.12	24.05.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	10	No	No
180	464646	22.05.12	24.05.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	Yes- AN
181	464640	21.05.12	24.05.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	41	3100	9	No	Yes- AN
182	464621	22.05.12	24.05.12	F	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	8	No	Yes -HT

Serial Number	In Patient Number	Date of Birth	Date of Screening	Sex	Age(Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes																Final Impression	Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
									Otatoacoustic emission test																					
									First								Second													
									Left				Right				Left				Right									
									2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000						
183	464566	21.05.12	24.05.12	F	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	No
184	464611	01.04.12	24.05.12	F	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	8	No	Yes-AN
185	464601	03.04.12	24.05.12	M	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	8	No	Yes-HT
186	464609	01.04.12	05.04.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	3100	10	No	Yes -HT
187	464659	03.04.12	05.04.12	M	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2900	9	No	No
188	464658	03.04.12	05.04.12	F	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	8	No	Yes-HT
189	464728	01.04.12	05.04.12	M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	9	No	Yes- AN
190	464822	03.04.12	05.04.12	F	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	41	3000	10	No	No
191	464867	03.04.12	05.04.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	9	No	NO
192	465007	02.04.12	05.04.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	8	No	No
193	465213	04.03.12	05.03.12	F	2	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2900	8	No	No
194	465393	03.03.12	05.03.12	M	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3000	9	No	Yes- AN
195	465691	03.03.12	05.03.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2900	8	No	No
196	465563	01.03.12	05.03.12	F	5	-	-	LSCS	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	39	3000	7	No	Yes-AN
197	465975	03.03.12	05.03.12	F	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2900	9	No	Yes- AN
198	465546	04.03.12	05.03.12	M	2	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3000	8	No	No
199	463636	16.07.12	19.07.12	F	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2900	9	No	Yes -HT
200	463598	16.07.12	19.07.12	F	4	+	+	ND	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	37	2800	7	No	Yes-AN
201	463593	16.07.12	19.07.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	9	No	No
202	469539	18.07.12	19.07.12	M	2	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	10	No	NO
203	463591	16.07.12	19.07.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	9	No	No
204	463582	17.07.12	19.07.12	F	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	41	3200	8	No	Yes -HT
205	463502	16.07.12	19.07.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	8	No	No
206	463564	16.07.12	19.07.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	9	No	Yes -HT
207	463566	16.07.12	19.07.12	F	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	7	No	Yes -HT
208	463568	15.07.12	19.07.12	M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	10	No	Yes-AN

Serial Number	In Patient Number	Date of Birth	Date of Screening	Sex	Age(Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes																Final Impression	Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
									Otatoacoustic emission test																					
									First								Second													
									Left				Right				Left				Right									
									2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000						
209	463263	16.07.12	19.07.12	F	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	9	No	No
210	463236	13.07.12	19.07.12	M	7	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	NO
211	463233	16.07.12	19.07.12	F	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3000	8	No	No
212	462520	05.03.12	08.03.12	F	4	-	-	LSCS	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	39	2900	7	No	Yes- AN
213	463466	05.03.12	08.03.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3100	9	No	Yes -HT
214	461936	06.03.12	08.03.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2400	9	No	No
215	462245	06.03.12	08.03.12	M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2400	9	No	Yes- AN
216	469502	07.03.12	08.03.12	F	2	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	9	No	No
217	461977	03.03.12	05.03.12	M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	NO
218	462014	06.03.12	10.03.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	8	No	No
219	461972	06.03.12	07.03.12	M	2	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	Yes-AN
220	463001	08.04.12	14.04.12	M	7	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2700	8	No	No
221	462453	06.03.12	14.03.12	M	9	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	9	No	No
222	462586	06.03.12	14.03.12	F	9	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	8	No	Yes- AN
223	462478	02.03.12	14.03.12	M	13	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	9	No	Yes -HT
224	462547	06.03.12	09.03.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3000	9	No	NO
225	461960	04.03.12	06.03.12	F	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2900	10	No	Yes- AN
226	462492	06.03.12	14.03.12	F	9	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	41	3100	9	No	Yes-HT
227	462503	08.03.12	14.03.12	M	7	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	9	No	Yes- AN
228	462517	09.03.12	14.03.12	F	6	+	-	ND	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	38	2600	7	No	NO
229	462438	13.03.12	14.03.12	M	2	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3100	9	No	Yes-AN
230	462533	08.03.12	14.03.12	F	7	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2900	8	No	No
231	462520	11.03.12	14.03.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	8	No	NO
232	469077	07.05.12	10.05.12	M	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2900	8	No	No
233	468839	07.05.12	10.05.12	M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	9	No	Yes -HT
234	468885	07.05.12	10.05.12	F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	9	No	No

Serial Number	In Patient Number	Date of Birth	Date of Screening	Sex	Age(Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes																Final Impression	Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
									Otatoacoustic emission test																					
									First								Second													
									Left				Right				Left				Right									
									2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000						
235	468703	08.05.12	10.05.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	10	No	Yes-AN
236	468844	08.05.12	10.05.12	M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	9	No	NO
237	468833	08.05.12	10.05.12	F	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	41	3100	9	No	Yes-HT
238	468701	07.05.12	10.05.12	M	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	Yes-AN
239	467654	08.05.12	10.05.12	F	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3000	8	No	No
240	458743	09.05.12	10.05.12	M	3	-	-	LSCS	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	39	2900	7	No	NO
241	468779	10.05.12	10.05.12	F	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	9	No	NO
242	468795	10.05.12	10.05.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	9	No	NO
243	468796	09.05.12	10.05.12	M	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	9	No	No
244	468800	08.05.12	10.05.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	10	No	No
245	468310	08.05.12	10.05.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2500	9	No	Yes- AN
246	468358	06.05.12	10.05.12	M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	9	No	Yes -HT
247	468246	08.05.12	10.05.12	F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	7	No	Yes- AN
248	468249	06.05.12	10.05.12	F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	No
249	468251	08.05.12	10.05.12	M	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	8	No	Yes-AN
250	468256	08.05.12	10.05.12	F	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	8	No	Yes -HT
	468498			M	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	2500	8	No	Yes- AN
	465785			F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	No
	475682			M	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2500	9	No	NO
	465762			F	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	10	No	Yes-AN
	469875			M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	2400	9	No	No
	466334			M	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	Yes -HT
	466382			F	4	-	-	LSCS	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	36	2200	8	No	NO
	465768			M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	3000	8	No	NO
	478512			M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	2900	7	No	No
	467908			M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2500	9	No	Yes -HT

Serial Number	In Patient Number	Date of Birth	Date of Screening	Sex	Age(Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes																Final Impression	Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
									Otatoacoustic emission test																					
									First								Second													
									Left				Right				Left				Right									
									2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000						
	468987			F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	Yes -HT
	465738			M	6	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	8	No	Yes-AN
	467213			M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	3000	9	No	No
	465724			F	2	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	Yes- AN
	467583			F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2900	10	No	No
	46875			M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	3100	9	No	Yes- AN
	478123			F	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2700	8	No	Yes -HT
	475321			M	3	+	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	3000	8	No	No
	463429			M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2900	9	No	Yes- AN
	467890			F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	3100	9	No	No
	468907			F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2700	9	No	NO
	478231			M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	No
	465787			F	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	2800	8	No	Yes-AN
	465766			M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2500	7	No	No
	468909			M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2900	9	No	No
	468900			F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	41	2800	8	No	Yes- AN
	46579			M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	8	No	NO
	469805			F	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	9	No	Yes -HT
	467328			M	3	-	-	ND	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	P	40	3100	9	No	NO
	467902			M	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2800	10	No	No
	467432			F	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	Yes -HT
	476530			F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2500	8	No	Yes-AN
	478291			M	4	-	-	ND	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	38	2700	8	No	No
	476321			M	3	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2800	9	No	Yes -HT
	463434			F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	No

Serial Number	In Patient Number	Date of Birth	Date of Screening	Sex	Age(Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes																Final Impression	Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
									Otatoacoustic emission test																					
									First								Second													
									Left				Right				Left				Right									
									2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000						
	467332			M	5	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2500	8	No	Yes -HT
	467990			M	4	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2900	8	No	No
	472232			F	3	-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	9	No	Yes -HT
	473829			F	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	Yes -HT
	472980			M	5	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	41	3000	10	No	Yes-AN
	472543			M	4	-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3100	9	No	No
	439836			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2800	8	No	Yes- AN
	473822			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	2800	8	No	No
	472843			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2500	9	No	Yes- AN
	473534			M		-	-	ND	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	P	41	2700		No	Yes -HT
	473355			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2500		No	No
	465009			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	9	No	Yes- AN
	467004			M		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2800	9	No	No
	471123			F		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2800	8	No	Yes- AN
	472431			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	3000	8	No	No
	473654			M		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3100	9	No	Yes-AN
	473221			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	No
	473545			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2800	10	No	No
	473654			M		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2500	8	No	Yes- AN
	473433			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2700	8	No	Yes -HT
	467334			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	3100	9	No	Yes -HT
	472433			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2700	7	No	NO
	475653			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	Yes-HT
	472873			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	41	2800	10	No	Yes- AN
	445332			M		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2500	8	No	NO

Serial Number	In Patient Number	Date of Birth	Date of Screening	Sex	Age(Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes																Final Impression	Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
									Otatoacoustic emission test																					
									First								Second													
									Left				Right				Left				Right									
									2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000						
	479566			M		+	+	LSCS	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	40	2900	9	No	Yes-AN
	476655			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	8	No	NO
	476653			F		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
	476623			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	41	3000	8	No	NO
	474831			F		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3100	10	No	Yes- AN
	475342			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2800	10	No	Yes- AN
	467231			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	2800	9	No	Yes-AN
	475090			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	2500	10	No	No
	484651			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	2700	8	No	Yes- AN
	476453			F		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	No
	478112			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	Yes- AN
	472113			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2500	9	No	No
	469900			F		-	-	ND	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	38	2700	7	No	Yes -HT
	567784			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	9	No	Yes-AN
	469907			M		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3100	9	No	No
	460998			M		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	8	No	Yes -HT
	460096			F		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	8	No	No
	474845			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	9	No	Yes -HT
	472543			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2500	9	No	No
	475543			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	10	No	Yes -HT
	479986			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	40	2800	8	No	Yes -HT
	463574			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	2800	8	No	Yes-AN
	467908			M		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	3000	9	No	No
	478693			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	3100	7	No	Yes- AN
	475684			F		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	9	No	No

Serial Number	In Patient Number	Date of Birth	Date of Screening	Sex	Age(Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes																Final Impression	Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
									Otatoacoustic emission test																					
									First								Second													
									Left				Right				Left				Right									
									2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000						
	476998			M		-	-	ND	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	36	2800	10	No	Yes- AN
	465609			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2500	8	No	Yes -HT
	468889			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	2700	9	No	No
	470001			M		+	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	2700	8	No	Yes- AN
	470023			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	3000	9	No	No
	474653			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	3000	8	No	Yes- AN
	475687			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2600	10	No	No
	578493			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	10	No	Yes-AN
	476533			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	9	No	No
	456672			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2600	10	No	No
	468079			M		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2900	8	No	Yes- AN
	486734			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	3100	9	No	Yes -HT
	476893			F		-	+	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	3000	8	No	Yes -HT
	465763			M		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2600	9	No	Yes- AN
	467564			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	Yes-HT
	475864			M		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	3000	7	No	Yes- AN
	475643			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2900	9	No	Yes- AN
	475597			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2700	6	No	Yes-AN
	467863			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	2900	9	No	No
	465767			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	2700	9	No	Yes- AN
	478697			F		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	3000	8	No	No
	486970			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	3000	7	No	Yes-AN
	478965			F		-	-	ND	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P	37	2600	9	No	No
	476834			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2800	8	No	Yes- AN
	463455			M		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2800	8	No	No

Serial Number	In Patient Number	Date of Birth	Date of Screening	Sex	Age(Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes																	Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
									Otatoacoustic emission test																					
									First								Second													
									Left				Right				Left				Right									
									2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000						
	478996			F		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		38	2600	8	No	No
	478890			F		-	-	ND	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R		38	2900	9	NO	Yes- AN
	471332			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		36	3100	7	No	No
	474433			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		39	3000	9	No	Yes-AN
	475586			M		+	+	LSCS	R	R	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P		37	2600	8	No	No
	475851			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		37	2800	9	No	No
	475651			F		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		38	3000	8	No	Yes- AN
	477876			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		39	2900	7	No	Yes -HT
	477689			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		39	2700	9	No	Yes -HT
	478576			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		40	2900	6	No	Yes- AN
	475859			M		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		36	2800	9	No	Yes-HT
	465448			F		+	-	ND	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P		36	3100	9	No	Yes- AN
	475863			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		36	3000	8	No	Yes- AN
	469998			M		-	-	ND	R	R	R	R	R	R	R	R	P	P	P	P	P	P	P	P	P		38	2800	7	No	Yes-AN
	467582			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		37	3000	9	No	No
	478695			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		40	3100	8	No	Yes- AN
	465751			M		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		38	3100	9	No	No
	465873			M		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		39	2900	8	No	NO
	478561			F		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		39	3100	7	No	NO
	465836			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		38	2700	9	No	NO
	487665			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		39	3000	6	No	HT
	476542			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		39	3000	9	No	NO
	462724			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		38	2600	9	No	NO
	474836			F		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		39	2800	9	No	AN
	472413			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P		40	2800	8	No	NO

Serial Number	In Patient Number	Date of Birth	Date of Screening	Sex	Age(Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes																Final Impression	Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
									Otatoacoustic emission test																					
									First								Second													
									Left				Right				Left				Right									
									2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000	2000	3000	4000	6000						
	472523			F		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	2600	9	No	NO
	472543			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2900	8	No	Yes- AN
	472644			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	3100	7	No	NO
	472621			F		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	3000	9	No	NO
	472821			M		-	-	ND	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	36	2600	6	No	Yes- AN
	477465			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	36	2800	9	No	No
	479980			F		-	-	LSCS	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	3000	9	No	Yes -HT
	475687			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2900	8	No	Yes-AN
	477099			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	39	2700	7	No	NO
	415135			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	37	2900	9	No	Yes -HT
	475866			M		-	-	ND	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	38	2800	8	No	NO

Serial Number	In Patient Number	Sex	Age (Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes									Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
							Otatoacoustic emission test														
							Left				Right									
							2000	3000	4000	6000	2000	3000	4000	6000						
1	461580	M	6	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	AN
2	457246	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	7	No	AN
3	457948	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	9	No	HT
4	457496	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	8	No	NO
5	457697	M	6	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2900	9	No	AN
6	458500	M	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	7	No	NO
7	489170	F	2	NO	YES	ND	P	P	P	P	P	P	P	P	P	37	2600	10	No	AN
8	458344	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	9	No	HT
9	458280	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3100	8	No	NO
10	457937	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	8	No	AN
11	458436	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3000	7	No	NO
12	458361	M	3	YES	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	7	No	AN
13	458496	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	3100	8	No	NO
14	457862	F	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	10	No	HT
15	458511	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
16	457845	M	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	7	No	HT
17	456342	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
18	457983	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	AN
19	458356	M	4	NO	YES	LSCS	P	P	P	P	P	P	P	P	P	39	2900	9	No	NO
20	458328	F	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3000	10	No	HT
21	458317	F	4	NO	YES	ND	P	P	P	P	P	P	P	P	P	37	2800	7	No	NO
22	458443	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	9	No	AN
23	458446	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	2900	8	No	NO
24	458636	M	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	2900	9	No	NO
25	458820	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	7	No	AN
26	458933	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2600	10	No	AN
27	459451	M	6	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	9	No	NO
28	459288	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	7	No	NO
29	459456	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	8	No	NO
30	459633	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	7	No	NO
31	459437	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2600	8	No	AN
32	459403	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	9	No	NO
33	459411	M	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2900	9	No	NO
34	459385	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2700	8	No	NO
35	460601	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	10	No	NO
36	461198	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	9	No	AN
37	469353	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2800	8	No	NO
38	561452	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2600	8	No	AN
39	461510	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	2900	9	No	NO
40	461418	M	6	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2600	8	No	NO
41	461533	F	5	NO	YES	LSCS	P	P	P	P	P	P	P	P	P	40	3100	9	No	HT

Serial Number	In Patient Number	Sex	Age (Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes									Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
							Otatoacoustic emission test														
							Left				Right									
							2000	3000	4000	6000	2000	3000	4000	6000						
42	4615112	M	4	NO	YES	ND	P	P	P	P	P	P	P	P	P	38	2800	10	No	AN
43	461584	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2900	9	No	NO
44	461519	F	7	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3000	9	No	HT
45	459669	M	6	YES	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	NO
46	459706	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	8	No	NO
47	459948	M	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	10	No	NO
48	459945	M	6	YES	NO	ND	R	R	R	R	R	R	R	R	R	38	2700	7	No	AN
49	459920	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
50	459921	M	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	9	No	NO
51	459962	M	4	NO	YES	ND	P	P	P	P	P	P	P	P	P	37	2800	8	No	NO
52	460016	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	9	No	NO
53	460374	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	AN
54	460360	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2700	9	No	NO
55	460318	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2900	10	No	NO
56	460317	F	6	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	8	No	HT
57	460298	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	NO
58	460236	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	9	No	AN
59	460296	F	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	8	No	NO
60	460291	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	2900	9	No	NO
61	460281	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	9	No	AN
62	460375	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	8	No	NO
63	460341	M	5	NO	YES	ND	P	P	P	P	P	P	P	P	P	38	2900	7	No	AN
64	460398	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	10	No	NO
65	460485	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	10	No	NO
66	460759	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
67	460825	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	8	No	NO
68	461178	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
69	460970	F	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	8	No	NO
70	461172	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	9	No	AN
71	461265	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	9	No	NO
72	461734	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	8	No	NO
73	453099	M	8	NO	YES	ND	R	R	R	R	R	R	R	R	R	38	2700	7	No	AN
74	453167	F	6	NO	NO	ND	R	R	R	R	R	R	R	R	R	38	2800	7	No	NO
75	453196	M	7	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	10	No	NO
76	453095	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	8	No	AN
77	453296	M	2	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2700	8	No	NO
78	453354	F	2	NO	NO	ND	R	R	R	R	R	R	R	R	R	38	2600	7	No	AN
79	453457	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
80	453880	F	1	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	10	No	NO
81	453821	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2600	9	No	NO
82	453993	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	8	No	NO

Serial Number	In Patient Number	Sex	Age (Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes									Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
							Otatoacoustic emission test													
							Left				Right									
							2000	3000	4000	6000	2000	3000	4000	6000						
83	453994	M	2	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	NO
84	454579	M	2	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	9	No	NO
85	454225	F	2	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2600	9	No	AN
86	454320	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2700	8	No	NO
87	454297	F	2	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
88	454295	M	2	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2400	10	No	AN
89	454257	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2600	10	No	NO
90	454354	M	6	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	8	No	NO
91	454368	M	2	YES	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	9	No	NO
92	454429	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	8	No	NO
93	455188	F	2	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2500	9	No	NO
94	455287	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	AN
95	455900	M	2	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2900	8	No	NO
96	455714	M	6	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	8	No	HT
97	45613	F	2	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2900	7	No	NO
98	457085	M	6	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2900	9	No	NO
99	457114	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2600	9	No	NO
100	457087	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	2300	8	No	NO
101	457136	F	2	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	AN
102	457227	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	9	No	NO
103	457502	M	7	NO	NO	ND	R	R	R	R	R	R	R	R	R	37	2600	7	No	AN
104	457095	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	10	No	NO
105	457179	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	10	No	NO
106	457496	F	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	9	No	HT
107	457163	M	2	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2400	9	No	NO
108	457147	M	6	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2900	8	No	AN
109	457078	F	3	NO	YES	LSCS	P	P	P	P	P	P	P	P	P	38	3000	9	No	NO
110	457204	M	2	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
111	457177	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	9	No	AN
112	457379	M	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	2400	8	No	NO
113	457695	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	8	No	HT
114	457496	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	NO
115	457163	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
116	457147	F	6	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2900	10	No	NO
117	457078	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2500	9	No	AN
118	457204	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
119	457177	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	8	No	AN
120	457279	F	4	NO	NO	LSCS	R	R	R	R	R	R	R	R	R	39	3000	7	No	NO
121	457695	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	2900	9	No	NO

Serial Number	In Patient Number	Sex	Age (Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes									Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
							Otatoacoustic emission test													
							Left				Right									
							2000	3000	4000	6000	2000	3000	4000	6000						
122	457777	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
123	457761	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2400	8	No	HT
124	457744	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2700	8	No	NO
125	457947	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2600	9	No	NO
126	457797	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	9	No	HT
127	457713	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	10	No	AN
128	458068	F	2	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2200	8	No	NO
129	457937	M	2	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	8	No	NO
130	491902	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	9	No	NO
131	491877	M	4	YES	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3100	7	No	NO
132	491808	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2200	9	No	NO
133	491644	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	10	No	NO
134	490276	M	6	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	AN
135	492075	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2600	9	No	NO
136	491621	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	AN
137	49633	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2400	9	No	NO
138	491150	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	8	No	HT
139	491163	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2900	10	No	NO
140	498172	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	10	No	NO
141	470327	F	6	NO	NO	ND	R	R	R	R	R	R	R	R	R	38	2700	9	No	AN
142	480458	F	6	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	10	No	NO
143	470122	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	8	No	AN
144	478695	F	6	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3000	9	No	NO
145	472068	M	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2900	8	No	NO
146	470442	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
147	470039	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2300	9	No	AN
148	470092	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2800	8	No	NO
149	470126	F	6	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	8	No	HT
150	469734	F	6	YES	NO	ND	P	P	P	P	P	P	P	P	P	39	2800	9	No	NO
151	469819	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	10	No	NO
152	469840	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	10	No	AN
153	469244	F	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	8	No	NO
154	469317	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
155	469820	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3000	9	No	NO
156	469281	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	AN
157	469270	F	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	9	No	HT
158	469269	M	6	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2500	8	No	AN
159	469027	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2800	9	No	NO
160	469031	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	7	No	NO

Serial Number	In Patient Number	Sex	Age (Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes									Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
							Otatoacoustic emission test													
							Left				Right									
							2000	3000	4000	6000	2000	3000	4000	6000						
161	463930	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
162	463780	F	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	9	No	NO
163	463808	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2900	8	No	HT
164	464047	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	NO
165	464034	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3000	10	No	NO
166	464076	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	9	No	NO
167	464684	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2600	9	No	NO
168	464136	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	10	No	NO
169	464136	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2800	8	No	NO
170	464125	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2600	9	No	AN
171	464158	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2900	9	No	NO
172	464163	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	36	2600	8	No	NO
173	464168	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3000	9	No	NO
174	464353	F	10	NO	YES	ND	P	P	P	P	P	P	P	P	P	38	2600	7	No	NO
175	464367	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2800	9	No	NO
176	464365	F	6	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	9	No	NO
177	464367	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	2900	8	No	NO
178	464371	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	AN
179	464650	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2900	10	No	NO
180	464646	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
181	464640	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	41	3100	9	No	NO
182	464621	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	8	No	HT
183	464566	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
184	464611	F	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	8	No	AN
185	464601	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	8	No	NO
186	464609	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	3100	10	No	NO
187	464659	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	2900	9	No	NO
188	464658	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	8	No	NO
189	464728	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	9	No	AN
190	464822	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	41	3000	10	No	NO
191	464867	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	9	No	NO
192	465007	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	8	No	NO
193	465213	F	2	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	2900	8	No	NO
194	465393	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3000	9	No	AN
195	465691	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2900	8	No	NO
196	465563	F	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	7	No	AN
197	465975	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	2900	9	No	AN
198	465546	M	2	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3000	8	No	NO
199	463636	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	2900	9	No	HT

Serial Number	In Patient Number	Sex	Age (Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes									Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
							Otatoacoustic emission test														
							Left				Right									
							2000	3000	4000	6000	2000	3000	4000	6000						
200	463598	F	4	NO	NO	ND	R	R	R	R	R	R	R	R	R	37	2800	7	No	AN
201	463593	M	4	NO	YES	LSCS	P	P	P	P	P	P	P	P	P	40	3100	9	No	NO
202	469539	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	10	No	NO
203	463591	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	9	No	NO
204	463582	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	41	3200	8	No	NO
205	463502	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2900	8	No	NO
206	463564	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	9	No	NO
207	463566	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	7	No	NO
208	463568	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	10	No	NO
209	463263	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	9	No	NO
210	463236	M	7	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	NO
211	463233	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3000	8	No	NO
212	462520	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2900	7	No	AN
213	463466	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3100	9	No	NO
214	461936	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2400	9	No	NO
215	462245	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2400	9	No	NO
216	469502	F	2	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	9	No	NO
217	461977	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	NO
218	462014	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2900	8	No	NO
219	461972	M	2	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
220	463001	M	7	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2700	8	No	NO
221	462453	M	9	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2800	9	No	NO
222	462586	F	9	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	8	No	AN
223	462478	M	13	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2900	9	No	NO
224	462547	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3000	9	No	NO
225	461960	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	2900	10	No	AN
226	462492	F	9	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	41	3100	9	No	HT
227	462503	M	7	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	9	No	AN
228	462517	F	6	YES	NO	ND	R	R	R	R	R	R	R	R	R	38	2600	7	No	NO
229	462438	M	2	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3100	9	No	AN
230	462533	F	7	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	2900	8	No	NO
231	462520	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2800	8	No	NO
232	469077	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2900	8	No	NO
233	468839	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	9	No	HT
234	468885	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	9	No	NO
235	468703	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2800	10	No	AN
236	468844	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2900	9	No	NO
237	468833	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	41	3100	9	No	HT
238	468701	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	8	No	AN

Serial Number	In Patient Number	Sex	Age (Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes									Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
							Otatoacoustic emission test													
							Left				Right									
							2000	3000	4000	6000	2000	3000	4000	6000						
239	467654	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3000	8	No	NO
240	458743	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2900	7	No	NO
241	468779	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	9	No	NO
242	468795	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	9	No	NO
243	468796	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2800	9	No	NO
244	468800	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2800	10	No	NO
245	468310	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2500	9	No	AN
246	468358	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2900	9	No	AN
247	468246	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2800	7	No	AN
248	468249	F	5	NO	YES	ND	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
249	468251	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	8	No	HT
250	468256	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	3100	8	No	AN
251	468498	M	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	36	2500	8	No	NO
252	465785	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
253	475682	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2500	9	No	NO
254	465762	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	10	No	AN
255	469875	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	2400	9	No	NO
256	466334	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	2800	9	No	HT
257	466382	F	4	NO	YES	LSCS	P	P	P	P	P	P	P	P	P	36	2200	8	No	NO
258	465768	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	3000	8	No	NO
259	478512	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	2900	7	No	NO
260	467908	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	2500	9	No	NO
261	468987	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	8	No	NO
262	465738	M	6	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2900	8	No	AN
263	467213	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	3000	9	No	NO
264	465724	F	2	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
265	467583	F	4	NO	YES	ND	P	P	P	P	P	P	P	P	P	38	2900	10	No	NO
266	46875	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	3100	9	No	NO
267	478123	F	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2700	8	No	HT
268	475321	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	37	3000	8	No	NO
269	463429	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2900	9	No	AN
270	467890	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	3100	9	No	NO
271	468907	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2700	9	No	NO
272	478231	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	37	2800	8	No	NO
273	465787	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	2800	8	No	AN
274	465766	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	37	2500	7	No	NO
275	468909	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2900	9	No	NO
276	468900	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	41	2800	8	No	AN
277	46579	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	8	No	NO

Serial Number	In Patient Number	Sex	Age (Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes									Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
							Otatoacoustic emission test													
							Left				Right									
							2000	3000	4000	6000	2000	3000	4000	6000						
278	469805	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3000	9	No	HT
279	467328	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	40	3100	9	No	NO
280	467902	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	40	2800	10	No	NO
281	467432	F	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	2800	9	No	HT
282	476530	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2500	8	No	AN
283	478291	M	4	NO	NO	ND	R	R	R	R	R	R	R	R	R	38	2700	8	No	NO
284	476321	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	40	2800	9	No	HT
285	463434	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
286	467332	M	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	37	2500	8	No	HT
287	467990	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	2900	8	No	NO
288	472232	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2800	9	No	HT
289	473829	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	9	No	HT
290	472980	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	41	3000	10	No	AN
291	472543	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	3100	9	No	NO
292	439836	F	4	NO	YES	ND	P	P	P	P	P	P	P	P	P	40	2800	8	No	AN
293	473822	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	2800	8	No	NO
294	472843	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2500	9	No	AN
295	473534	M	6	NO	NO	ND	P	P	P	P	P	P	P	P	P	41	2700	9	No	HT
296	473355	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2500	9	No	NO
297	465009	M	7	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2900	9	No	AN
298	467004	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	2800	9	No	NO
299	471123	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	40	2800	8	No	AN
300	472431	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	3000	8	No	NO
301	473654	M	6	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3100	9	No	AN
302	473221	M	8	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
303	473545	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	40	2800	10	No	NO
304	473654	M	3	NO	YES	LSCS	P	P	P	P	P	P	P	P	P	38	2500	8	No	AN
305	473433	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2700	8	No	HT
306	467334	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	40	3100	9	No	HT
307	472433	F	6	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2700	7	No	NO
308	475653	M	6	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	9	No	HT
309	472873	F	7	NO	NO	ND	P	P	P	P	P	P	P	P	P	41	2800	10	No	NO
310	445332	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2500	8	No	NO
311	479566	M	5	NO	NO	LSCS	R	R	R	R	R	R	R	R	R	40	2900	9	No	AN
312	476655	F	7	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2800	8	No	NO
313	476653	F	7	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
314	476623	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	41	3000	8	No	NO
315	474831	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3100	10	No	NO
316	475342	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	40	2800	10	No	NO

Serial Number	In Patient Number	Sex	Age (Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes									Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
							Otatoacoustic emission test														
							Left				Right									
							2000	3000	4000	6000	2000	3000	4000	6000						
317	467231	M	6	NO	YES	ND	P	P	P	P	P	P	P	P	P	36	2800	9	No	AN
318	475090	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	2500	10	No	NO
319	484651	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	2700	8	No	AN
320	476453	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
321	478112	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	8	No	AN
322	472113	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	40	2500	9	No	NO
323	469900	F	6	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	7	No	NO
324	567784	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2900	9	No	NO
325	469907	M	6	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3100	9	No	NO
326	460998	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	2700	8	No	NO
327	460096	F	6	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2800	8	No	NO
328	474845	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2800	9	No	NO
329	472543	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2500	9	No	NO
330	475543	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2900	10	No	HT
331	479986	M	4	NO	YES	ND	P	P	P	P	P	P	P	P	P	40	2800	8	No	NO
332	463574	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	2800	8	No	NO
333	467908	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	3000	9	No	NO
334	478693	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	3100	7	No	NO
335	475684	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	2800	9	No	NO
336	476998	M	5	NO	YES	ND	P	P	P	P	P	P	P	P	P	36	2800	10	No	AN
337	465609	M	6	NO	YES	ND	P	P	P	P	P	P	P	P	P	38	2500	8	No	HT
338	468889	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	2700	9	No	NO
339	470001	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	36	2700	8	No	AN
340	470023	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	3000	9	No	NO
341	474653	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	3000	8	No	AN
342	475687	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2600	10	No	NO
343	578493	F	6	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2800	10	No	AN
344	476533	M	7	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
345	456672	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2600	10	No	NO
346	468079	M	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	2900	8	No	AN
347	486734	M	6	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	3100	9	No	NO
348	476893	F	3	NO	YES	ND	P	P	P	P	P	P	P	P	P	39	3000	8	No	HT
349	465763	M	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	37	2600	9	No	AN
350	467564	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	8	No	HT
351	475864	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	3000	7	No	AN
352	475643	F	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2900	9	No	AN
353	475597	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	6	No	AN
354	467863	M	6	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	2900	9	No	NO
355	465767	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	2700	9	No	AN

Serial Number	In Patient Number	Sex	Age (Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes									Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
							Otatoacoustic emission test													
							Left				Right									
							2000	3000	4000	6000	2000	3000	4000	6000						
356	478697	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	36	3000	8	No	NO
357	486970	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	3000	7	No	AN
358	478965	F	6	YES	NO	ND	P	P	P	P	P	P	P	P	P	37	2600	9	No	NO
359	476834	M	7	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2800	8	No	NO
360	463455	M	5	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	37	2800	8	No	NO
361	478996	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	2600	8	No	NO
362	478890	F	3	NO	NO	ND	R	R	R	R	R	R	R	R	R	38	2900	9	NO	AN
363	471332	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	3100	7	No	NO
364	474433	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	3000	9	No	AN
365	475586	M	4	NO	NO	LSCS	R	R	P	P	P	P	P	P	P	37	2600	8	No	NO
366	475851	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2800	9	No	NO
367	475651	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	3000	8	No	AN
368	477876	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2900	7	No	NO
369	477689	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2700	9	No	HT
370	478576	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	40	2900	6	No	AN
371	475859	M	7	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	36	2800	9	No	HT
372	465448	F	7	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	3100	9	No	NO
373	475863	F	8	NO	YES	ND	P	P	P	P	P	P	P	P	P	36	3000	8	No	AN
374	469998	M	6	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	7	No	AN
375	467582	M	7	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	3000	9	No	NO
376	478695	F	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	40	3100	8	No	NO
377	465751	M	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	3100	9	No	NO
378	465873	M	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2900	8	No	NO
379	478561	F	7	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	3100	7	No	NO
380	465836	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2700	9	No	NO
381	487665	F	7	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	3000	6	No	HT
382	476542	M	5	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	3000	9	No	NO
383	462724	M	6	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2600	9	No	NO
384	474836	F	4	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	39	2800	9	No	AN
385	472413	F	6	NO	NO	ND	P	P	P	P	P	P	P	P	P	40	2800	8	No	NO
386	472523	F	3	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	36	2600	9	No	NO
387	472543	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2900	8	No	AN
388	472644	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	3100	7	No	NO
389	472621	F	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	3000	9	No	NO
390	472821	M	5	NO	YES	ND	R	R	R	R	R	R	R	R	R	36	2600	6	No	AN
391	477465	M	7	NO	NO	ND	P	P	P	P	P	P	P	P	P	36	2800	9	No	NO
392	479980	F	7	NO	NO	LSCS	P	P	P	P	P	P	P	P	P	38	3000	9	No	HT
393	475687	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2900	8	No	AN
394	477099	M	4	NO	NO	ND	P	P	P	P	P	P	P	P	P	39	2700	7	No	NO

Serial Number	In Patient Number	Sex	Age (Days)	Family History of Hearing Loss	Consanguinous Marriage	Mode of Delivery	Hearing screening outcomes									Gestational age (weeks)	Weight(gms)	APGAR score at 5 mins	Craniofacial anomalies	Maternal illness
							Otatoacoustic emission test													
							Left				Right									
							2000	3000	4000	6000	2000	3000	4000	6000						
395	415135	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	37	2900	9	No	NO
396	475866	M	3	NO	NO	ND	P	P	P	P	P	P	P	P	P	38	2800	8	No	NO