"MECONIUM STAINED AMNIOTIC FLUID AND PERINATAL OUTCOME – A PROSPECTIVE CROSS SECTIONAL STUDY"

By

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ENDORSEMENT

This is to certify that the dissertation entitled **"MECONIUM STAINED AMNIOTIC FLUID AND PERINATAL OUTCOME"** is a bonafide research work done by **REG NO. BJ0112004.**

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LIST OF ABBREVIATIONS USED

APE - Antepartum eclampsia

Assym - Assymetrical

BMI - Body Mass index

CTG - Cardiotocography

cm - Centimeter

CNS - Central nervous system

CO_2 - Carbon dioxide

CS - Caesarean Section

CVS - Cardiovascular system

FHR - Fetal Heart rate

GDM - Gestational diabetes mellitus

GIT - Gastro-intestinal tract

Hb - Hemoglobin

HIE - Hypoxic ischemic encephalopathy

HIV - Human immune deficiency virus

HbsAg - Hepatitis B surface antigen

Inj. - Injection

IV - Intravenous

Kgs - Kilograms

LFT - Liver function test

MSAF - Meconium Stained Amniotic Fluid

Min - Minute

NICU - Neonatal intensive care unit

NST - Non stress test

PIH - Pregnancy induced hypertension

PROM - Premature rupture of membranes

PR - Pulse rate

PV - Per vaginum

RBS - Random blood sugar

RFT - Renal function test

RR - Respiratory rate

SCN - Special care nursery

SPO_2 - Saturation percentage of oxygen

USG - Ultrasonography

ABSTRACT

Background and objectives

The significance of meconium in amniotic fluid is a widely debated subject. Traditionally meconium has been viewed as a harbinger of impending or ongoing fetal compromise; however some of the investigators believe that it is not associated with fetal hypoxia, acidosis or fetal distress, but a physiological process due to gut maturity.

In this study we attempt to find out the incidence of meconium staining and its effect on fetal parameters like heart rate, morbidity and mortality and whether the mode of delivery has an effect on the perinatal outcome and if a caesarean section is necessary in such cases.

Methods:

This prospective cross-sectional study was conducted in Department of Obstetrics and Gynecology at KLE University's Dr. Prabhakar Kore Charitable Hospital and MRC between January 2013 to October 2013. A total of 340 pregnant women with more than 37 weeks of gestation were included in the study. Effect of thin and thick meconium on fetus was studied. Fetal monitoring, mode of delivery, age distribution, parity, indication for LSCS, cardiotocography, Apgar score, birth weight, resuscitation of baby were the parameters studied. All babies were followed up to discharge from the hospital.

Result:

In this study the incidence of meconium stained amniotic fluid was 8.5%. Among 340 cases the incidence of thick meconium stained was 57.65%, whereas 42.35% of cases were thin meconium stained liquor. Maximum incidence of

meconium stained amniotic fluid was seen in age group 22-25 i.e.157 (46.1%). Meconium stained amniotic fluid was more common in 37-40 weeks of gestation. Post datism contributed to 25.5% of the risk factors. CTG was pathological in 73.60% especially in thick meconium, compared to thin meconium which was 26.4%

Incidence of operative interventions were increased in thick meconium stained (79.5%) compared to thin meconium stained deliveries (20.5%). Lower segment caesarean section was more seen in early labour in cases with thick meconium stained amniotic fluid. One of the most common indication for LSCS was fetal distress in thick meconium stained liquor (72.96%).

The incidence of Apgar score >7, at 1 minute, for thin and thick meconium was 52.2% and 47.8% respectively. The incidence of Apgar score <7, for thin and thick was 68.4% and 31.6% respectively. Apgar score at 5 minute is mostly >7 in thin meconium i.e., 139 (43.71%) and 179 in thick meconium (56.29%). Apgar score <7 in thin and thick meconium was 5 and 17.

Out of 340 cases, 76 babies needed NICU admissions. Birth asphyxia attributed to 6.63% of NICU admission in thick meconium stained liquor and 2.7% in thin meconium stained liquor 3 cases of perinatal mortality was seen in in thick meconium stained. Neonatal deaths were seen in 0.88%.

Interpretation and Conclusion:

Thus based on our findings we conclude that the rates of caesarean section were higher in patients with thick meconium stained liquor. Cardiotocography abnormalities, Lower apgar scores at 1 and 5 minutes were observed more in thick meconium stained liquor than in thin meconium stained

liquor. However the perinatal outcomes in the thick and thin meconium stained liquor groups were insignificant.

Keywords: Meconium stained amniotic fluid; Meconium aspiration syndrome; Apgar, Caesarean section

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INTRODUCTION

The term Meconium is derived from the Greek word mek onion, which means poppy juice or opium, presumable because of its tarry appearance or because of Aristotle's belief that it induces sleep in the foetus[1].

Meconium is the earliest stools of a fetus which is composed of materials ingested during the time the infant spends in the uterus which includes intestinal epithelial cells, lanugo, mucus, amniotic fluid and water.

There is strong evidence that most of meconium passage occurs by each of three basic mechanisms:

1. As a physiological maturational event
2. As a response to acute hypoxic event
3. As a response to chronic intrauterine hypoxia.

Various stimuli are known to cause relaxation of sphincter tone and subsequent passage of meconium in to the amniotic fluid. Any insult resulting in fetal hypoxia releases arginine vasopressin which stimulates the smooth muscles of the colon. The induced hyper peristalsis causes relaxation of fetal anal sphincter. Increased vagal activity from inutero stresses e.g. cord compression may stimulate meconium passage[2]. Knowing the various causes, the most common of them all is gastrointestinal maturity. Some studies have found increased rate of meconium in amniotic fluid as gestational age advances[3]. This can be explained by the fact that hormone motilin is secreted in increasing quantities by the fetus as gestational age advances[4].

MSAF is known to complicate 12-16% of all deliveries[5]. MSAF has always been considered a harbinger of foetal compromise because of its direct correlation with fetal distress and increased likelihood of inhalation of meconium with deleterious effects on the neonatal lungs or represents physiological maturity of the gut[6]. Meconium stained amniotic fluid might signify underlying acute or chronic fetal hypoxia with adverse perinatal outcome which requires vigilant monitoring especially if associated with cardiotocographic abnormality. Management would require awareness of the risk, appropriate intrapartum care and a combined obstetric neonatal approach.

Infants born through meconium stained amniotic fluid are about hundred times more likely to develop respiratory distress[7]. The most significant effect of MSAF on the neonate is Meconium aspiration syndrome (MAS) which develops shortly after birth with radiographic evidence of aspiration pneumonitis. This syndrome occurs in up to 5% of infants, accounting for 2% of all perinatal deaths and 12% mortality rate of babies with MAS[7, 8].

Amnioinfusion has been advocated as a technique to reduce the incidence of meconium aspiration and to improve neonatal outcome. Although generally considered safe, there are reported complications associated with amnioinfusion[2]. However, a large proportion of women with meconium stained amniotic fluid have infants who have taken in meconium within the trachea or bronchioles before meconium passage has been noted and before amnioinfusion can be performed by the obstetrician. Furthermore, meconium aspiration syndrome is hypothesized to predate labour in many cases[9].

Few trials of amnioinfusion in small studies suggested that women receiving amnioinfusion had fewer operative deliveries and less distress[10-15]. Some studies compared prophylactic amnioinfusion versus therapeutic amnioinfusion, there were no differences found in operative deliveries, fetal distress which proves that even with prophylactic amnioinfusion meconium aspiration syndrome is not a preventable phenomenon and would guarantee a better neonatal outcome [16].

To conclude, the prognosis depends on the fetal heart rate abnormalities associated with meconium stained amniotic fluid. In the presence of meconium stained amniotic fluid, an early surgical intervention which includes Caesarean section in the absence of fetal heart abnormalities does not guarantee a better neonatal outcome as the mechanism of damage caused by meconium could have occurred inutero and may continue after delivery. An early surgical intervention also adds to the burden of maternal morbidity associated with operative delivery. The diagnosis of meconium stained amniotic fluid warrants a continuous cardiotocographic recording which portrays the status of the fetus and only in the event of fetal heart rate abnormalities which includes persistent variable deceleration, late decelerations or prolonged deceleration, an early surgical intervention may be carried out with a combined obstetric neonatal approach.

In this study our primary concern regarding meconium stained amniotic fluid has been directed at two major issues:

1. Significance of meconium as a sign of fetal distress or hypoxia which warrants urgent delivery.

2. Perinatal outcome following delivery.

Thereby with the detection of meconium stained amniotic fluid and continuous electronic fetal heart rate monitoring this study helps in arriving at a consensus whether meconium stained amniotic fluid is an indication for caesarean section for a better neonatal outcome.

OBJECTIVE

To evaluate the mode of delivery and perinatal outcome in patients with meconium stained amniotic fluid.

REVIEW OF LITERATURE

Meconium stained amniotic fluid occurs in 10-20%of all pregnancies and is usually associated with term fetuses. On the other hand, meconium aspiration syndrome occurs in 2-6% of these neonates and may be associated with significant neonatal morbidity including respiratory failure. Prevention of neonatal meconium aspiration syndrome remains a major objective for obstetricians and neonatologists[17].

Conflicting results have been reported regarding fetal outcome when the amniotic fluid is meconium stained. Some studies have reported an increased incidence of fetal distress and neonatal morbiditywhereas others have shown an increased incidence of neonatal morbidity only when other signs of asphyxia (ominous fetal heart rate decelerations and fetal acidosis) are present[12,13].

Amnioinfusion has been advocated as a technique to reduce the incidence of meconium aspiration and to improve neonatal outcome but there are complication associated with it such as uterine hypertonus, uterine rupture, placental abruption. Studies were performed to evaluate whether prophylactic amnioinfusion for meconium stained amniotic fluid would be beneficial and if it would decrease the incidence of meconium aspiration syndrome[18].

The initial trials of amnioinfusion generally consisted of small studies that randomized women with moderate to thick meconium stained amniotic fluid to receive prophylactic amnioinfusion or no amnioinfusion. These studies suggested that women receiving amnioinfusion had fewer operative deliveries and fetuses with significantly less distress[10-15]. Two Meta – analyses also found that amnioinfusion significantly reduced the frequency of meconium aspiration syndrome and the

incidence of meconium below the vocal cords in fetuses of pregnant women with MSAF treated with amnioinfusion[19-20].

A randomized trial in women with MSAF evaluated prophylactic amnioinfusion versus therapeutic amnioinfusion. The authors found no differences in operative deliveries, fetal distress, Apgar Scores[16].

A large international multicentre trial randomized 1998 women in labour at 36 weeks of gestation or later with thick MSAF to amnioinfusion or no amnioinfusion. The authors found that amnioinfusion did not reduce perinatal death (0.5% in both groups) or moderate or severe meconium aspiration (4.4% versus 3.1% in controls), nor was there a significant reduction in caesarean delivery (31.8% versus 29.0% in controls) [21].

Based on current literature, routine prophylactic amnioinfusion for meconium stained amniotic fluid is not recommended. Prophylactic use of amnioinfusion for MSAF should be done only in the setting of additional clinical trials. Data are not available on whether amnioinfusion for fetal heart rate deceleration in the presence of meconium stained amniotic fluid decreases meconium aspiration syndrome or other meconium related morbidities. However, amnioinfusion remains a reasonable approach in the treatment of repetitive variable deccelerations, regardless of amniotic fluid meconium status[22].

A Cochrane review showing196 women at term in early labour with meconium were randomized to receive either trans cervical intrapartumamnioinfusion with saline (96) or routine obstetrical care (100). Transcervicalamnioinfusion of one litre saline infused over 30-45 minutes. End points were relief of decelerations, incidence of vaginal delivery, presence of meconium below the neonatal cords, and

X-ray evidence of meconium aspiration. Amnioinfusion resulted in relief of decelerations in 75% of cases as compared to 7% in the control group. Eighty-eight percent of patients delivered vaginally as compared to 58% in the control group ($p< 0.001$). Neonatal outcome was significantly better in the infusion group. The incidence of meconium below the vocal cords was reduced from 48% to 17% ($p< 0.004$) using amnioinfusion with positive X-rays for meconium aspiration in only 12.5% versus 26% ($p < 0.5$). They concluded that transcervical intrapartum amnioinfusion is a safe, simple and inexpensive technique that reduces operative intervention and improves neonatal outcome, and is of tremendous relevance in developing countries[23].

There has also been a debate on the management of patients with meconium stained amniotic fluid. Because MSAF is associated with an increased risk of perinatal mortality and morbidity, its presence is a matter of concern to the obstetrician. Meconium passage can increase the incidence of admission to new-born intensive care unit with chemical pneumonitis, hypercapnoea, persistent pulmonary hypertension, neonatal asphyxia, MAS, however these are not always seen in MSAF.

Study done in Singapore by Arul Kumaran et al out of 319 patients with MSAF, 120 has light meconium stained liquor and 129 had moderate meconium stained liquor and 57 had thick meconium stained liquor. Caesarean section rate done for foetal distress for patients with thick meconium stained liquor was greater than clear liquor group however the perinatal outcome was not significant different in either of the groups which explains to us that passage of meconium and aspiration of meconium may be an inutero event. Thereby this study proved that presence of meconium in the absence of foetal heart rate changes was not a sign of distress and

did not warrant any immediate surgical intervention other than continuous intrapartum fetal heart rate monitoring. Following the initial bout of hypoxia which causes the passage of meconium repetitive bouts may lead to foetal asphyxia which can be avoided by careful monitoring and active management of labour instead of resorting to caesarean section without a definite indication[24].

Another study done in Karachi which consisted of 200 women with MSAF showed that foetal heart rate abnormality was greater in cases then control and also showed that caesarean section rates were greater in the exposed group then the non-exposed. The perinatal outcome was also poorer in the exposed group then the non exposed11. A multivariate logistic analysis done in January 1997 - December 2006 in Nigeria showed that a combination of abnormal FHR and meconium liquor significantly increases the odds of severe neonatal compromise at birth thereby leading to more caesarean section rate[25].

A prospective study carried out on 159 patients with MSAF. Thin and Thick MSAF constituted 39% and 61% cases respectively. Univariate analysis identified eight risk factors ($p<0.05$) i.e., primigravidity, postdated pregnancy, anemia, chorioamnionitis, prolonged labour, fetal distress, cord problems and fetal growth retardation. Six risk factors were identified when thick MSAF was analyzed separately – maternal age>30, primigravidity, postdated pregnancy, prolonged labour, fetal distress and cord problems. Mothers with postdated pregnancies, cord problems in labour and fetal distress are at increased risk of developing MSAF. Thick MSAF is likely with maternal age>30, post dated pregnancy and fetal distress. In the absence of these factors the risk of meconium in liquor is low[26].

A prospective observational study enrolled 80 cases where the man gestational age was 39.3+/-1.5 weeks and 38.5+/- 1.3 weeks in controls. There was 13.8% pregnancy induced hypertension in case group and 3.8% in control group. Pre – eclampsia were present 10% in case group and 1.1% in control group. Caesarean deliveries were high (75%) as compared to thin meconium (25%). Apgar scores in first and fifth minute were also low in cases. Birth Asphyxia was more in cases (20%). Meconium Aspiration Syndrome (25%) and convulsion (3.8%) were developed only in cases. Admissions in neonatal ward was more (22.5%) in cases ($p<0.050$ as compared to controls. Neonatal mortality was high (3.8%) in cases than controls (1.3%)[27].

A retrospective study done in Japan showed incidence of MSAF as 13%, The incidence of MSAF at preterm, term, post term were 9.1%, 13%, 48% respectively. The incidence of intrauterine fetal death, low Apgar score and low umbilical artery PH at delivery in cases with MSAF were significantly higher than those without MSAF in various gestational ages at delivery which proved that the obstetric management should be affected by meconium in the amniotic fluid[28].

A study was done on predictors of severe neonatal compromise following caesarian section for clinically diagnosed fetal distress. It was found that of the 246 singleton caesarean births 236 had an Apgar score of less than 7. 48.8% were severely compromised, whereas 47.2% had an APGAR scores between 4 and 7. Meconium liquor and long admission-diagnosis interval significantly reduce whereas combination of abnormal FHR and meconium liquor significantly increased the chances of severe neonatal compromise at birth[29].

A study which included 278 meconium stained neonates showed that thick meconium appeared to have significantly greater rates of academia, low APGAR scores at 1st and 5th minutes, more need for resuscitation and higher mortality rate. Meconium aspiration syndrome and hypoxia ischemic encephalopathy ere also significantly higher in infants with thick meconium. They finally concluded that thick meconium may cause more respiratory and other complications in neonates than thin meconium[17].

In another study conducted to know the incidence of perinatal risk factors in meconium aspiration syndrome it was found that of the 3360 live births, 437 infants (13%) were delivered through meconium stained amniotic fluid. Labours with MSAF were more likely to be associated with post term gestation, intrapartum fetal blood sampling, caesarian section deliveries (CS) and instrumental deliveries[30].

Another prospective study done in PGIMER, Chandigarh encompassing 238 cases showed that passage of thick and thin meconium was seen in 44 and 56% respectively. Passage of thick meconium was associated with severe asphyxia and carried a bad prognosis with increased risk of development of meconium aspiration syndrome, hypoxic ischemic encephalopathy, seizures and pulmonary leak syndrome which required aggressive team approach and was responsible for lowering the mortality to 7.7%[31].

Effect of clear liquor and meconium stained liquor on mode of delivery and evaluation of neonatal outcome was studies. In this study 500 cases with clear liquor and 250 cases with meconium stained liquor were selected. Of these 22% had Grade 1, 56% had Grade 2, 22% had Grade 3 Meconium stained liquor. There

were 16% post dated deliveries in meconium stained liquor as compared to 1% in subjects with clear liquor. It was concluded that MSAF is associated with increased neonatal morbidity and mortality[32].

An observational study in Obstetrics and Gynecology Unit of Liaquat university of Medical Health Sciences from June to November 2007 showed that out of a total 75 patients with meconium stained liquor, the patients with reactive CTG were 50 (66.7%) and with non reactive CTG 25(33.36%). Of the total, 45 (60%) patients were delivered through normal vaginal delivery, while 30 (40%) were delivered by Caesarean section. The rate of instrumental delivery was also increased which was 12 (26.7%). Among the neonates exposed to meconium stained liquor, 65 (82.7%) babies were delivered with apgar score >7. Only 13 (17.3%) babies were delivered with apgar score <7 in one minute giving a final conclusion that meconium stained amniotic fluid is a common occurrence during labour and is associated with increased caesarean section rate and fetal morbidity and mortality[33].

A study was done to identify potential predictors of MAS in pregnancies complicated by MSAF, incidence, morbidity and mortality was also reviewed. It was found that the incidence of MSAF was 13.97% and that of MAS was 8.57% and all deliveries associated with thick MSAF developed MAS. 40% mothers were associated with PROM and prolonged labour. Most common and significant risk factors associated with MAS were increased gestational age, increased caesarian sections and low PAGAR scores at 1 minute and 5 minutes. The neonatal mortality and morbidity was found to be more frequent in relation to thick meconium stained amniotic fluid[34].

A case control study of meconium staining of amniotic fluid in labour showed a positive significant association with MSAF: low social status, betelnut chewing, grand multiparity, past history of perinatal death and rupture of membranes to delivery interval. Compared with the controls, the cases had a higher caesarean section rate: more of their babies were admitted in Special Care Nursery (SCN); the mean stay of their babies in the SCN was longer; and the perinatal mortality was higher[35].

A prospective study done from July 1977 to March 1978 on 200 patients which showed that caesarean section rate in the meconium group was twice that in control group. There was also a significantly higher caesarean section rate in primiparas with meconium stained liquor and in mulitparas then with clear liquor[36].

Another study was done on fetal outcome in deliveries of patients with meconium stained liquor. Of the total 80 patients, 47 (58.75%) cases underwent caesarean section and 4 neonates had Apgar score < 7 out of which 2 (50%) survived while 2 (50%) could not be saved. Out of 80, 33 (41.25%) cases had vaginal deliveries, 19 (57.6%) had normal vaginal deliveries and 14 (42.4%) had instrumental vaginal intervention. There were 4 (5%) cases of pregnancy induced hypertension, 01 (1.25%) of GDM; in the both the mentioned conditions the Apgar score >7 in first 5 minutes and the neonates successfully survived. 01 (2.5%) cases had Meconium Aspiration Syndrome however the neonates were recovered. 02 (2.5%) cases had birth asphyxia with 100% perinatal mortality. The results denote comparatively bad prognosis in pregnancy women having meconium stained amniotic fluid. It was concluded that Meconium stained amniotic fluid is

associated with higher rate of caesarean sections, increased birth asphyxia and Meconium Aspiration Syndrome[37].

A prospective study done in Dept. of Obstetrics and Gynecology, MGM, Sewagram, Wardha, Maharashtra showed that fetal heart rate variations were more often in cases with thick meconium (86.36%) than with thin meconium (9.75%) (p value <0.005). Thick meconium group neonates had lower Apgar scores as compared to moderate and thin meconium group. The umbilical cord blood pH was below 7.2 in 4 (11.4%) neonates in thin meconium, 15 (42.85%) in moderate meconium and 30(68.18%) in thick meconium (p value<0.001). Neonatal complications were found in 36.36% of thick meconium group as compared to 14.28% of moderate meconium and none in thin meconium. This concluded that thick meconium should suggest immediate intervention, need for skilled pediatrician at the time of delivery and intensive care in the neonatal period to give a positive outcome[38].

Another study was done on significance of meconium stained amniotic fluid associated with early maternal and neonatal outcome. It was found that the incidence of passage of meconium was relatively higher in patients with pregnancy induced hypertension (20%) and pregnancy beyond 40 weeks (14.66%). Amongst the cases 28.66% patients had an abnormal fetal heart pattern and 12% had a variable fetal heart pattern whereas in controls the values were 8% and 3.33% respectively. The total number of patients with meconium aspiration was 18% whereas those with meconium aspiration syndrome were 6%. Based on these findings thin or thick meconium was considered to be associated with fetal distress[39].

Therefore management of meconium stained amniotic fluid should be a team approach which involves the obstetrician and also the neonatologists. Caesarean section without any indication has not been proven to improve the neonatal outcome in fact it adds to the burden of maternal morbidity, therefore this study was undertaken. In the end after analyzing various studies it has been concluded that deliveries with meconium stained amniotic fluid are associated with higher caesarean section rate and increased neonatal mortality and morbidity. Continuous CTG monitoring is recommended during labor and if managed by timely intervention, severe asphyxia and aspiration can be prevented.

Fetal distress is defined as alteration in fetal heart rate (FHR) i.e., either variable decelerations or late decelerations and the passage of meconium in response to underlying fetal hypoxia. Meconium Stained amniotic fluid is associated with higher rate of caesarean delivery which by itself is a reason for maternal morbidity. However the presence of meconium stained amniotic fluid in a laboring patient should not be the sole indication for immediate delivery by caesarean section. The presence of meconium stained amniotic fluid is an indication for careful monitoring preferably by continuous cardiotocography and careful watch for the development of any fetal heart rate irregularities and immediate intervention as directed.

We hypothesize that meconium stained amniotic fluid is an indication for continuous intrapartumcardiotocography monitoring and an early surgical intervention carried out does not have an influence on maternal and neonatal outcome.

In view of above observations, we conclude that thick or thin Meconium stained amniotic fluid in the absence of antecedent maternal risk factors or signs of fetal distress ex. Variable decelerations, late decelerations, prolonged

deccelerationsdoes not pose a serious threat to fetal wellbeing and that such patients could be monitored with continuous intrapartumcardiotocography and any immediate interventions carried out in the presence of normal CTG reading does not guarantee a good neonatal and maternal outcome.

METHODOLOGY

A prospective cross-sectional study of 340 cases of meconium stained amniotic fluid was studied between January 2013 to October 2013 at KLE's Dr. Prabhakar Kore Hospital, Belgaum, Karnataka, India; over a period of ten months.

Methods of collection of data

A careful history was taken from all cases particularly about age, parity,gravidity and duration of labour, previous obstetric history, previous obstetric complications.

A detailed clinical examination and appropriate investigations were done.

Inclusion criteria:

1. All pregnant women in labour with cephalic presentation with singletonpregnancy with meconium stained liquor irrespective of age, parity and stage of labour.
2. Pregnancy > 37 weeks of gestation age.
3. Meconium stained amniotic fluid diagnosed by spontaneous/artificial rupture of membranes/ intraoperatively.

Exclusion criteria:

1. Malpresentation
2. Multiple pregnancies
3. Fetal malformation
4. Intrauterine fetal demise
5. Obstetric complications: antepartum haemorrhage

1. Clinical examination:

a) History taking:

Age of the patient

Parity

History of previous pregnancies

Nature of delivery

Past history and personal history.

Post natal or post operative events.

b) General examination:

General condition, temperature, pulse rate, blood pressure were

Recorded. Jaundice, anaemia, edema and built of the patient was noted.

c) Systemic Examination:

The cardiovascular system was examined for the presence of murmurs

Lungs were carefully auscultated to rule out clinical abnormalities.

2. Obstetric Examination:

a) Abdominal Examination:

The height of the uterus, presentation, the positionand lie of foetus were noted down. The fetal heart was auscultated carefullywith doppler. Uterine contractions were recorded.

Pelvic Examination:

The position of cervix, dilatation, the presence or absence ofmembranes, the station of the presenting part were examined. Ifmembranes were absent the type of liquor, whether it was thin meconium or thickmeconium was documented.

The consistency of the amniotic fluid was categorized into

1. Thin – greenish yellow in appearance

2. Thick - dark green in appearance.

3. Investigations:

a) Complete hemogram.

b) Urine – Albumin, sugar and microscopy.

c) Blood grouping and Rh-typing.

d) HIV, HBSAG

e) RFT, LFT if required.

f) USG if required.

g) CTG.

Methodology:

Once the patient was diagnosed with meconium stained amniotic fluid and had met the inclusion criteria, she was subjected to continuous electronic fetal heart rate monitoring.

According to hospital protocol amnioinfusion was not recommended.

Those patients who had cardiotocography abnormality, their delivery were expedited by either lower segment caesarean section or vaginal delivery whichever was earliest.

The foetal heart rate abnormality was documented and classified according to ACOG guidelines[4.]

The rates of cervical dilatation, duration of labour were noted. If therewere any associated complications like PIH, PROM, anaemia, the specifictreatment was given.

Newborn: The Apgar score at one minute and five minutes was recorded.The respiratory system was examined for aspiration syndrome and signs were noted down.

Parameters like presence or absence of respiratory grunt, respiratory rate, and weight of the baby were recorded. If the baby is active, just thorough oropharyngeal suction was done and placed with mother. Apgar score >7 were considered as good.

If the baby did not cry spontaneously at birth, resuscitative measureslike oxygen inhalation, or endotracheal intubation, ambubagging were carried out.Numbers of days in NICU were noted and interventions like intubation, requirement for ventilation was observed.

Procedure

Prospective cross-sectional study

Sample size – 340

pq/d^2

p- Prevalence = 22% (according to recent studies done in India)

q- 100- prevalence = 86

20 % of prevalence

20% of 22 = 4.4

d = 4.4

Substituting the above values in $4pq/d^2$

= 340

Duration of study – from January 2013 to October 2013

ANALYSIS PLAN: The data was analysed using the following statistical tests:

1. Chi square test

2. Multiple logistic regression analysis.

RESULTS

The present study was conducted at Department of Obstetrics and Gynecology, K.L.E's Hospital and M.R.C. Belgaum during the period of January 2013 to October 2013. Of the 4047 deliveries, 340 met the inclusion criteria and were thus included in the study.

Table 1. Incidence of meconium stained amniotic fluid

Total number of deliveries n=4047	Number	Percentage
Meconium stained amniotic fluid	340	8.5%
Clear amniotic fluid	3707	91.5%

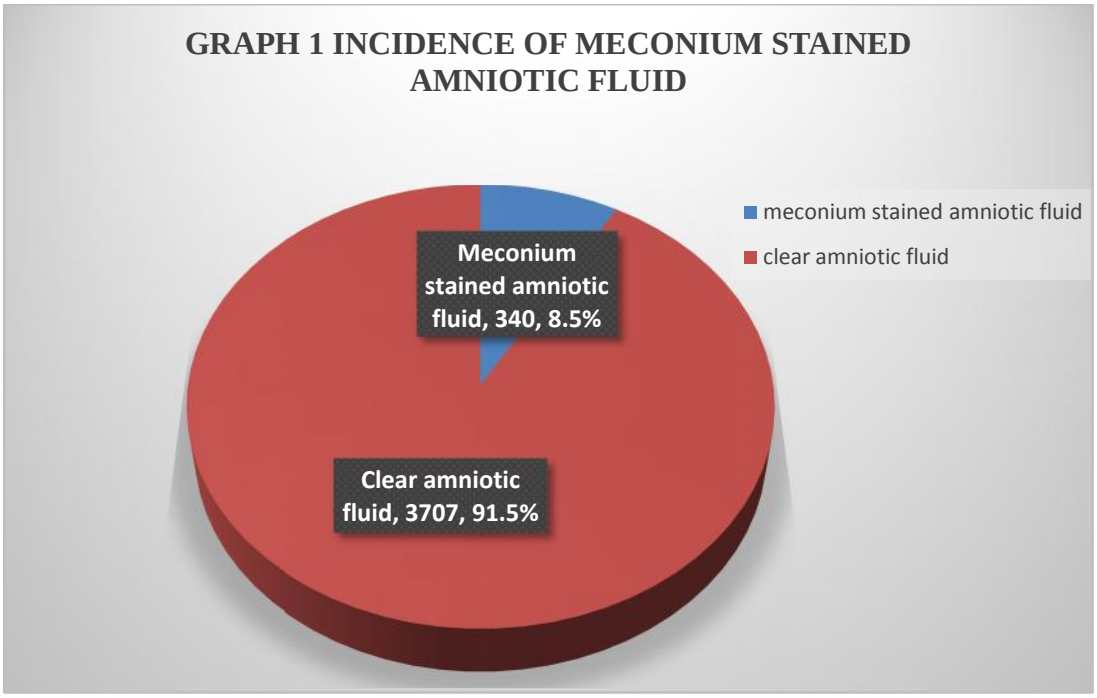
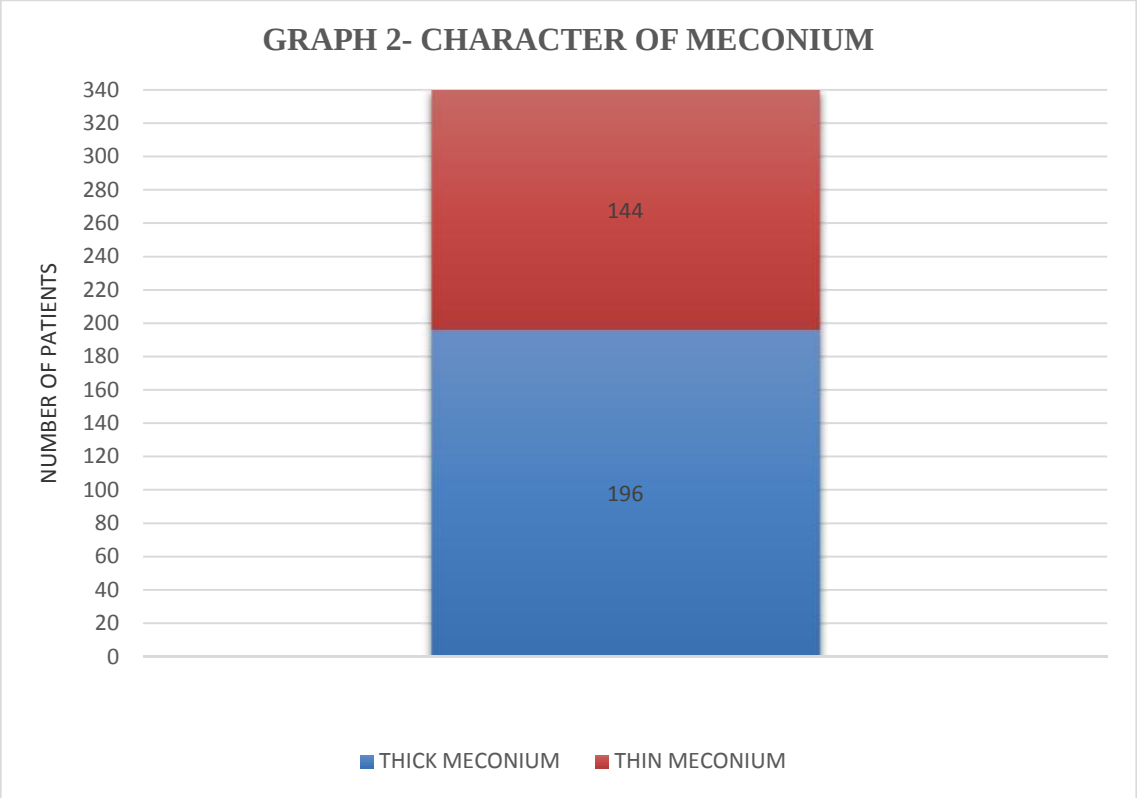


Table 2. Character of meconium

Character	Frequency	Percent (n=340)
Thick	196	57.65
Thin	144	42.35



Out of the told 340 cases, 196 cases had thick meconium and 144 had thin meconium.

Table 3. Age Distribution

Age groups	Thick (n=196) Number	Percentage	Thin(n=144) Number	Percentage	Total (n=144) Number	Percentage
<21	63	57.80	46	42.20	109	100.00
22 to25	92	58.60	65	41.40	157	100.00
26 to30	34	55.74	27	44.26	61	100.00
31 to35	7	53.85	6	46.15	13	100.00
Total	196	57.65	144	42.32	340	100.00
Chi square test p = 0.973						

Maximum incidence of meconium stained amniotic fluid was seen in age group 22-25 i.e.157 (46.1%) followed by < 21 years. The incidence was however lower in mothers of age more than 30 years.

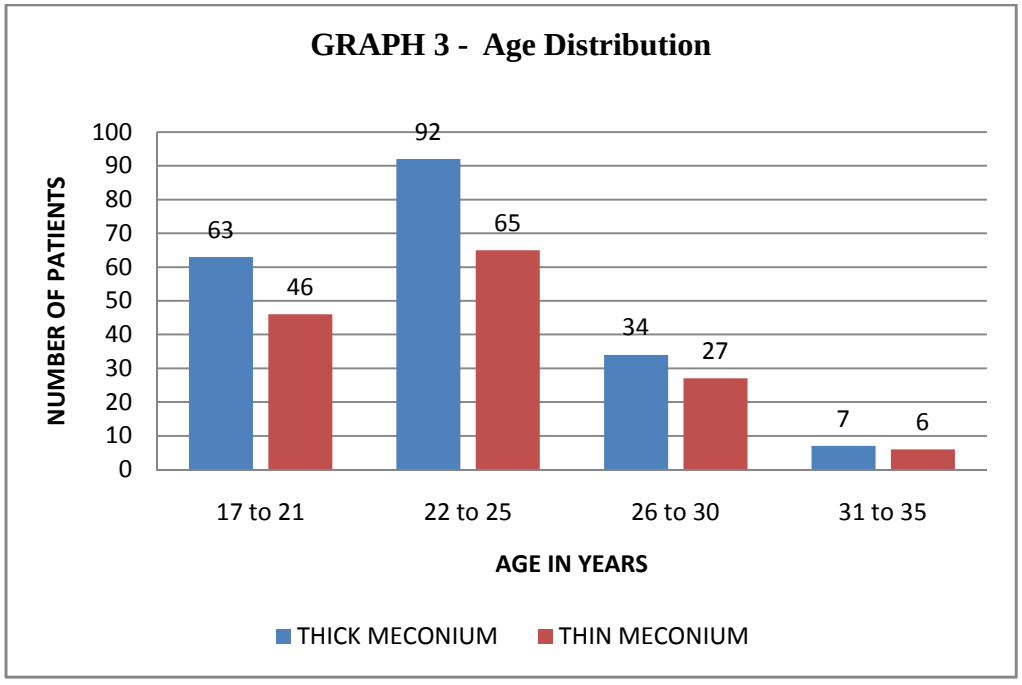


Table 4. Parity

Parity	Thick(n=196) Number	Percentage	Thin (n=144) Number	Percentage	Total (n=340) Number	Percentage
Primi	125	59.81	84	40.19	209	100.00
Multi	71	54.20	60	45.80	131	100.00
	196	57.65	144	42.35	340	100.00
Chi square test p =0.308						

The present study showed a significant increase in incidence of meconium stained amniotic fluid in primi which was 59.81% in thick meconium stained and 40.19% in thin meconium stained. 30% of primigravida (62) were more than 40 weeks. So the increase in the incidence of meconium stained amniotic fluid could be due to increase in duration of labour and period of gestation in primi.

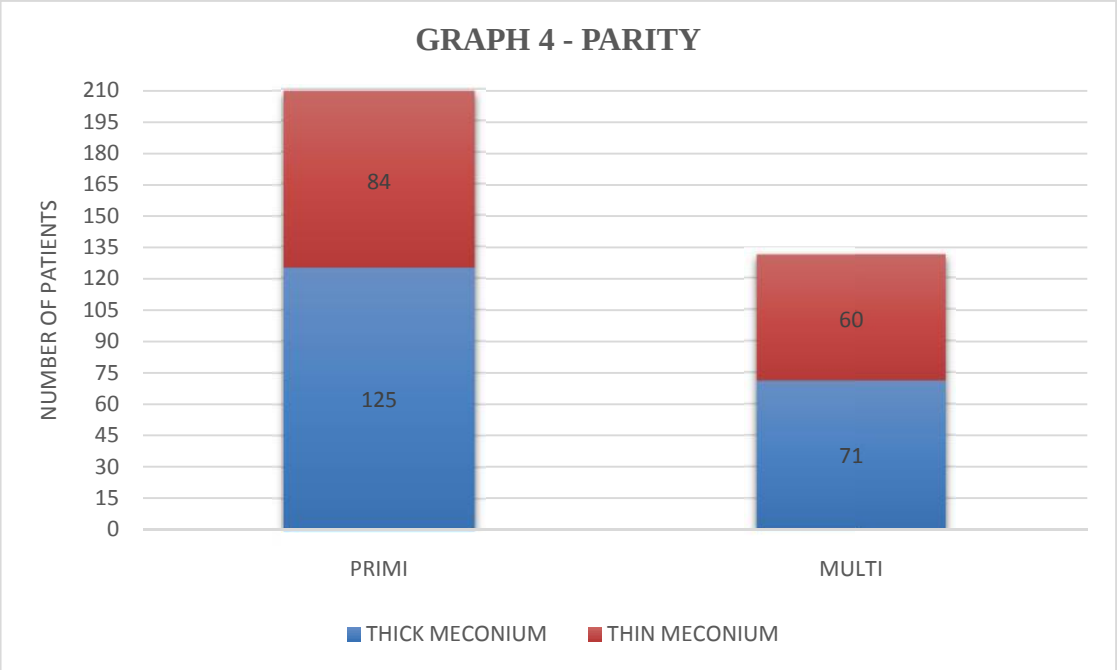


Table 5. Gestational Age

Gestational age (weeks)	Thick (n=196) Number	Percentage	Thin (n=144) Number	Percentage	Total(n=340) Number	Percentage
37 to 40	142	72.4	101	70.1	243	100.00
40.1 to 42	49	46.9	38	44.44	87	100.00
>/=42.1	5	0.02	5	0.02	10	100.00
Chi- square test p=0.833						

Meconium stained amniotic fluid was more common in 37-40 weeks of gestation. Mean gestational age was 39.13+/-1.23 weeks in present study.

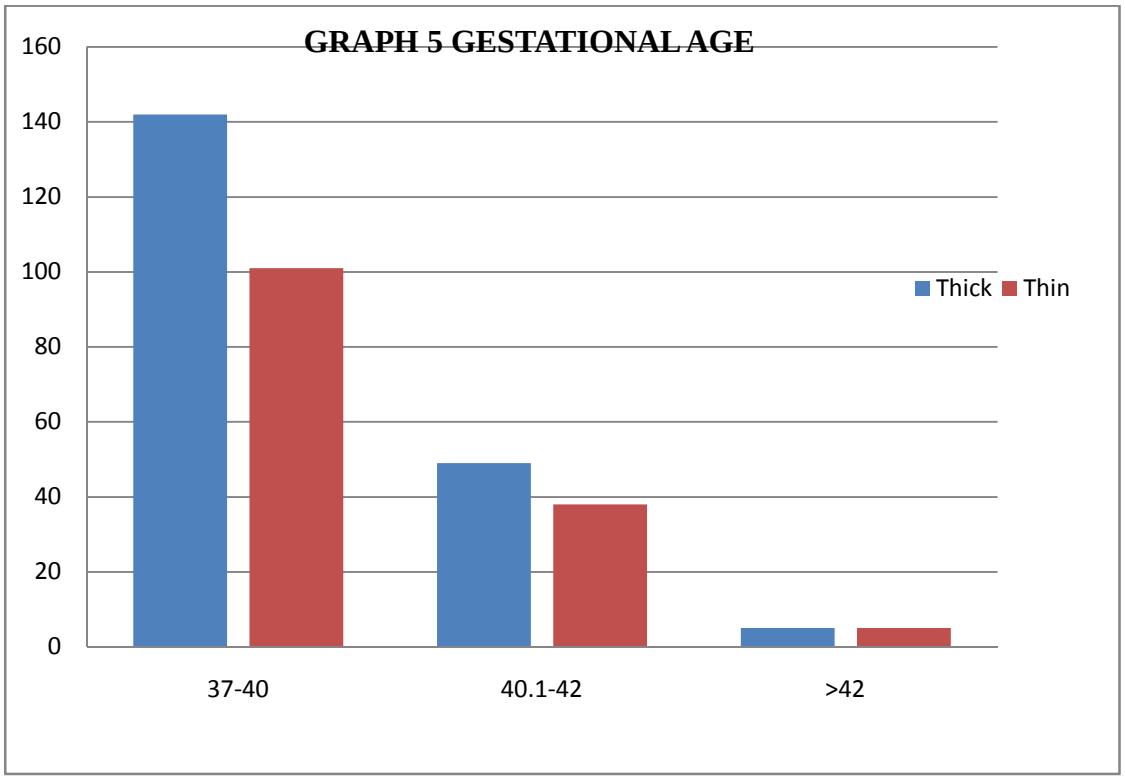
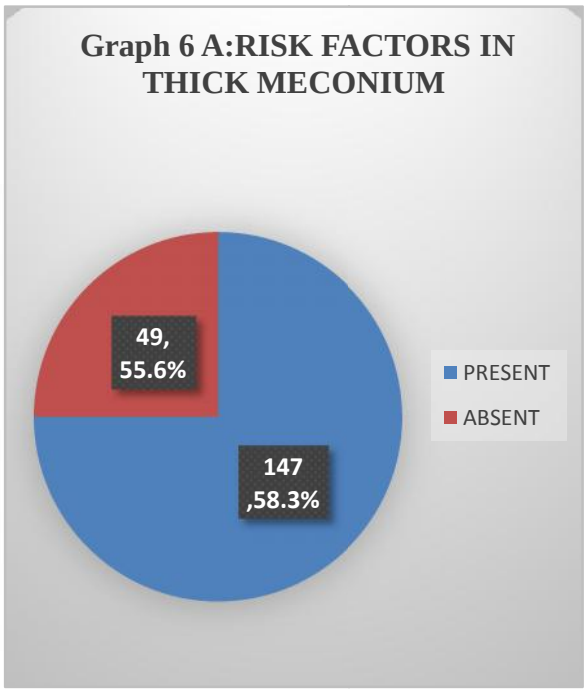


Table 6. Risk Factors

Risk factors	Thick (n=196) Number	Percentage	Thin (n=144) Number	Percentage	Total (n=340) Number	Percentage
Present	147	58.33	105	41.67	252	100.00
Absent	49	55.68	39	44.32	88	100.00
Total	196	57.65	144	42.35	340	100.00
Chi- square test p – 0.664						

Out of 340 cases of meconium stained amniotic fluid 74% were associated with risk factors and 26% had no risk factors.



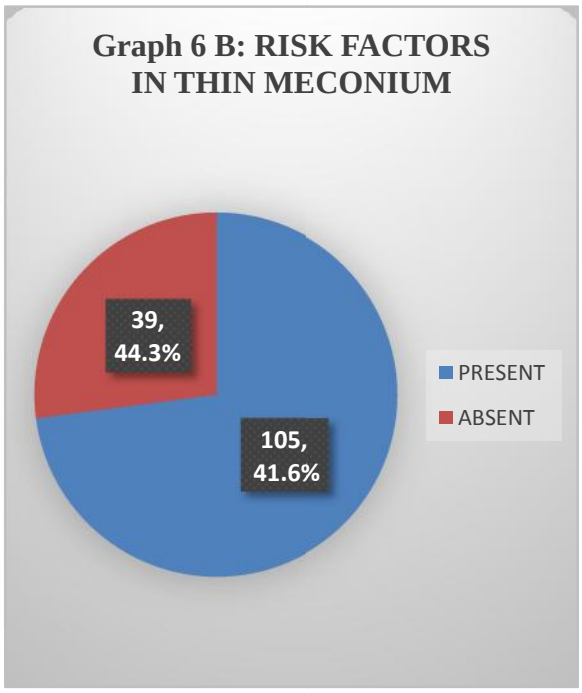
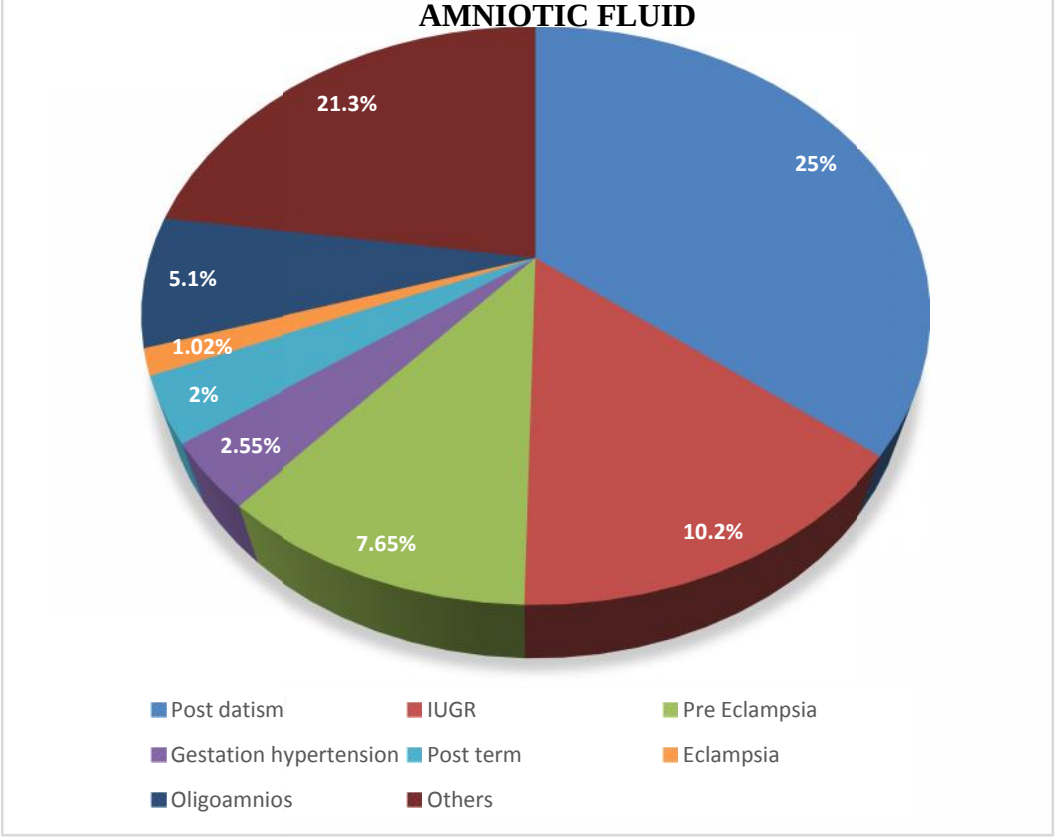


Table 7. Risk Factors

Risk Factors	Thick (n=196) Number	Percentage	Thin(n=144) Number	Percentage	Total(n=340) Number	Percentage
Post datism	49	25%	38	26.3%	87	25.5
IUGR	20	10.2	10	6.9	30	8.8
Pre Eclampsia	15	7.65	15	10.41	30	8.8
Gestational Hypertension	5	2.55	2	1.38	7	2.05
Post term	5	2	5	2	10	3
Eclampsia	2	1.02	1	0.69	3	0.88
Oligoamnios	10	5.1	3	2.0	13	3.8
Others	31	21.3	17	11.7	48	14.1
Chi square test p = 0.644						

Of the risk factors present 25.5%% were attributed to Post datism, Pre eclampsia – 11.7%, IUGR – 8.8%, Oligohydramnios – 3.8%, Anemia – 2.06%, Post term – 3%,Epilepsy – 1.47%, Excess liquor – 1.18, Antepartum eclampsia – 0.88%, Hypothyroidism – 0.59%, Active Tuberculosis – 0.29%, Anamnios – 0.29% and Bad obstetric history – 0.29%

GRAPH 7 A - RISK FACTORS IN THICK MECONIUM STAINED AMNIOTIC FLUID



GRAPH 7 B - RISK FACTORS IN THIN MECONIUM STAINED AMNIOTIC FLUID

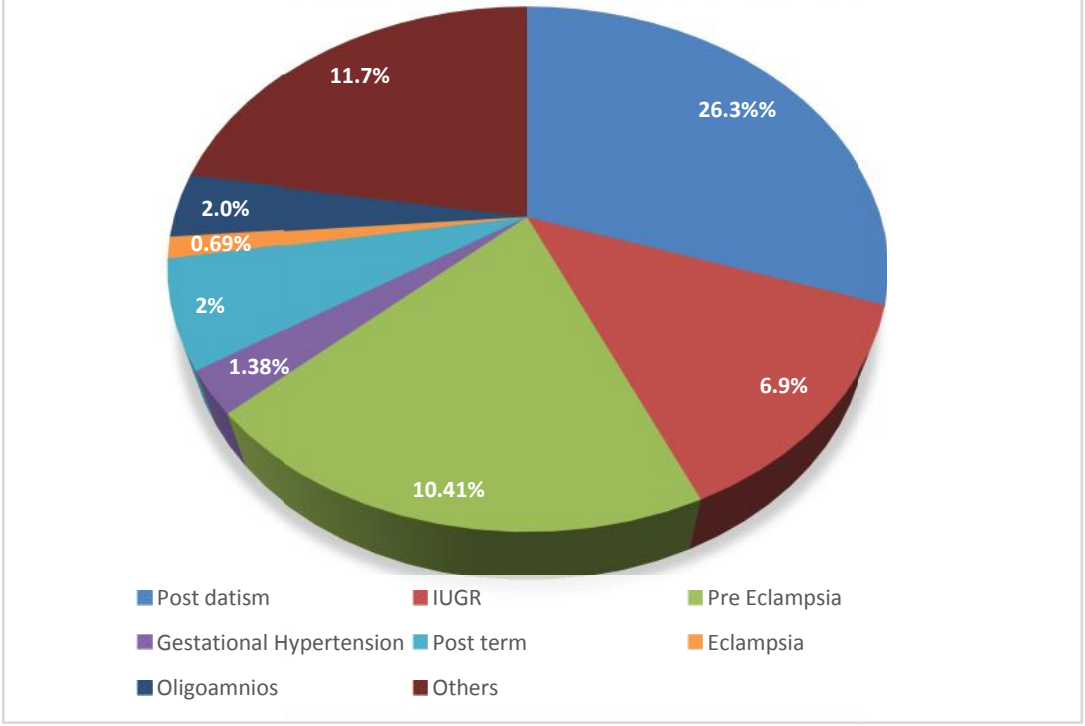


Table 8. Cervical dilatation on diagnosis.

PV (in cms)	Thick (n=196) Number	Percentage	Thin (n=144) Number	Percentage	Total (n=340) Number	Percentage
0 to 3	137	82.04	30	17.96	167	100.00
4 to 6	24	58.54	17	41.46	41	100.00
7 to 10	35	26.52	97	73.48	132	100.00
Chi square test p =<0.001						

The number of patients diagnosed as thick meconium stained liquor was more in the patients who were in early labour 82.04% and in thin meconium stained 17.96%. However patients were diagnosed with thin meconium stained were more in late labour 73.48% and 26.52% in thick meconium stained. This difference was found to be statistically significant.

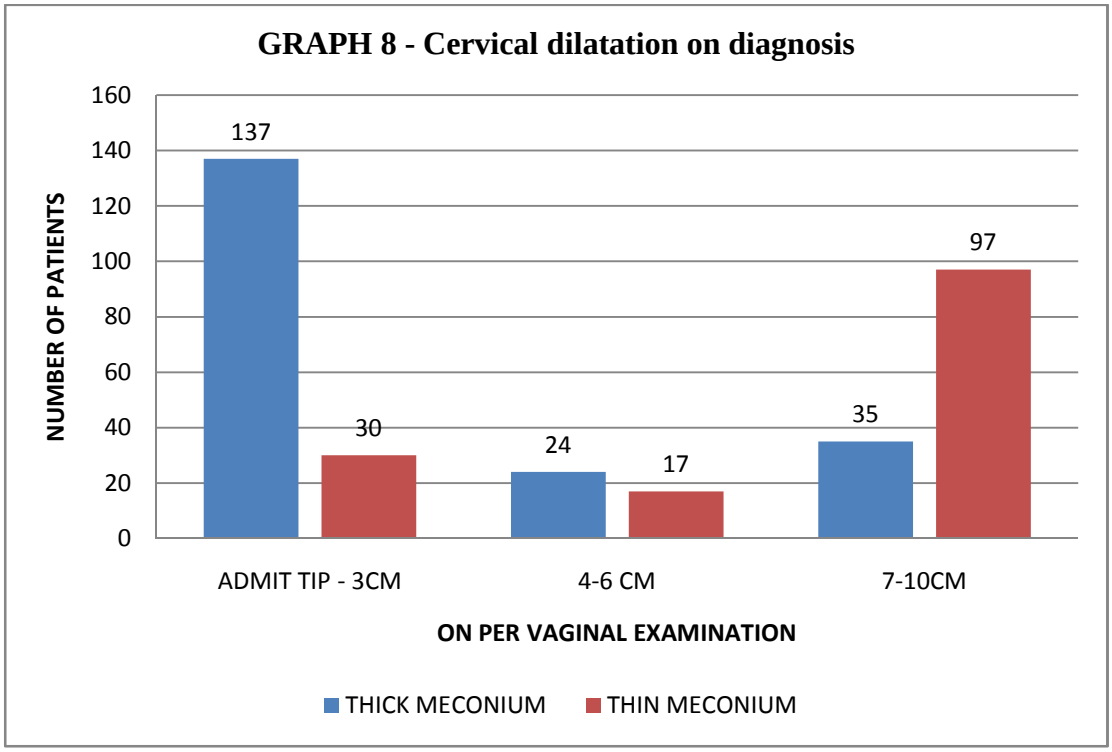


Table 8a. Cervical dilatation in thick meconium stained liquor.

	LSCS	VAGINAL
0-3	136	1
4-6	20	4
7-10	3	32
Chi square test p = <0.001		

The number of emergency lower segment caesarean section was more in patients with thick meconium stained liquor in whom it was detected early in labour which was found to be statistically significant. Of the 137 cases who underwent lower segment caesarean section 84 (61.3%) had fetal heart rate abnormality.

Table 8b. Cervical dilatation in thin meconium stained liquor.

	LSCS	VAGINAL
0-3	30	0
4-6	7	10
7-10	4	93
Chi square test p = <0.001		

The number of vaginal deliveries were more in patients with thin meconium stained in whom it was detected late in labour. Of the 30 cases who underwent lower segment caesarean section 13 (43.3%) had fetal heart rate abnormality.

Table 9. Cardiotocography Recording.

Category	Thick(n=196) Number	Percentage	Thin (n=144) Number	Percentage	Total (n=340) Number	Percentage
Normal	58	38.16	94	61.84	152	100.00
Suspicious	7	70.00	3	30.00	10	100.00
Pathological	131	73.60	47	26.40	178	100.00
Chi square test p =<0.001						

CTG was pathological especially in thick meconium accounting for 73.6% than compared to thin meconium 26.4% and also accounting for increased incidence in operative interventions.

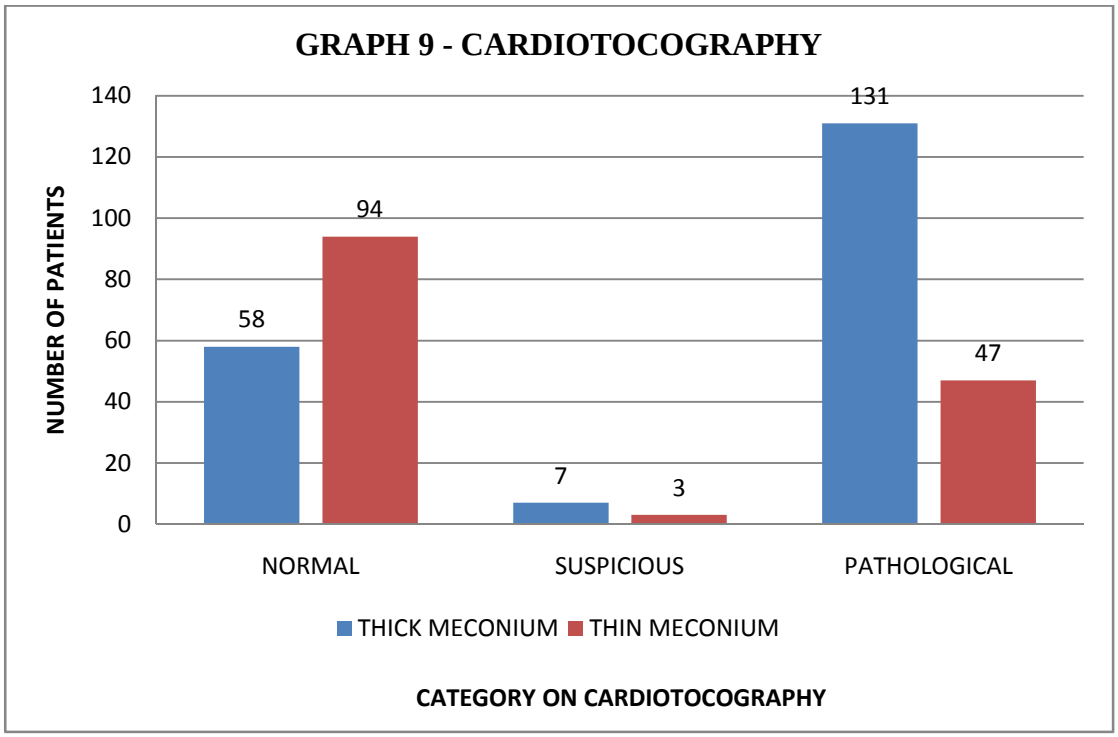


Table 10. Mode of delivery

Mode	Thick(n=196) Number	Percentage	Thin (n=144) Number	Percentage	Total (n=340) Number	Percentage
Vaginal	26	22.6	89	77.39	115	100.00
LSCS	159	79.5	41	20.5	200	100.00
Instrumental	11	44.0	14	56.0	25	100.00
Chi square test p =<0.001						

There were increased incidence of operative interventions i.e., 79.5%% in thick meconium stained as compared to thin meconium stained i.e., 20.5% and22.6% of thick meconium stained liquor had vaginal deliveries and 77.39% in thin meconium stained liquor.

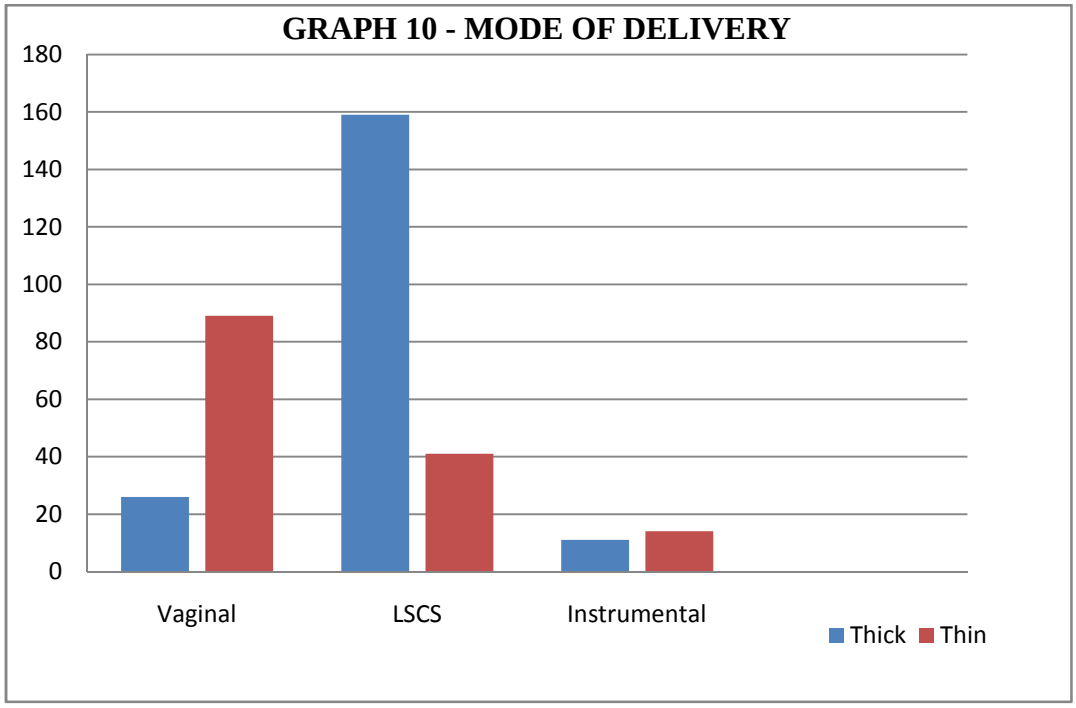


Table 11. Indications for LSCS.

Indications	Thick(n=196) Number	Percentage	Thin (n=144) Number	Percentage	Total (n=340) Number	Percentage
Fetal distress	145	72.96	30	15.31	175	50.88
Meconium stained liquor	6	3.06	0	0.00	6	1.76
Non progress of labour	9	4.59	6	3.06	15	4.41
Persistentoccipito posterior position	1	0.51	0	0.00	1	0.29
Prolonged PROM	1	0.51	1	0.51	2	0.59
Second stage arrest	0	0.00	1	0.51	1	0.29
Total	162	80.81	38	19.19	200	100.00
Chi square test p = 0.0369						

Fetal distress was found to be one of the most common indication for LSCS in thick meconium stained liquor, incidence being 50.8% indicating that there could have been an intrauterine even which resulted in hypoxia. Other indications were meconium stained liquor accounting for 1.76%, non progress of labour being 4.41%, occipito posterior 0.29%, premature rupture of membranes 0.59% and second stage arrest 0.29%

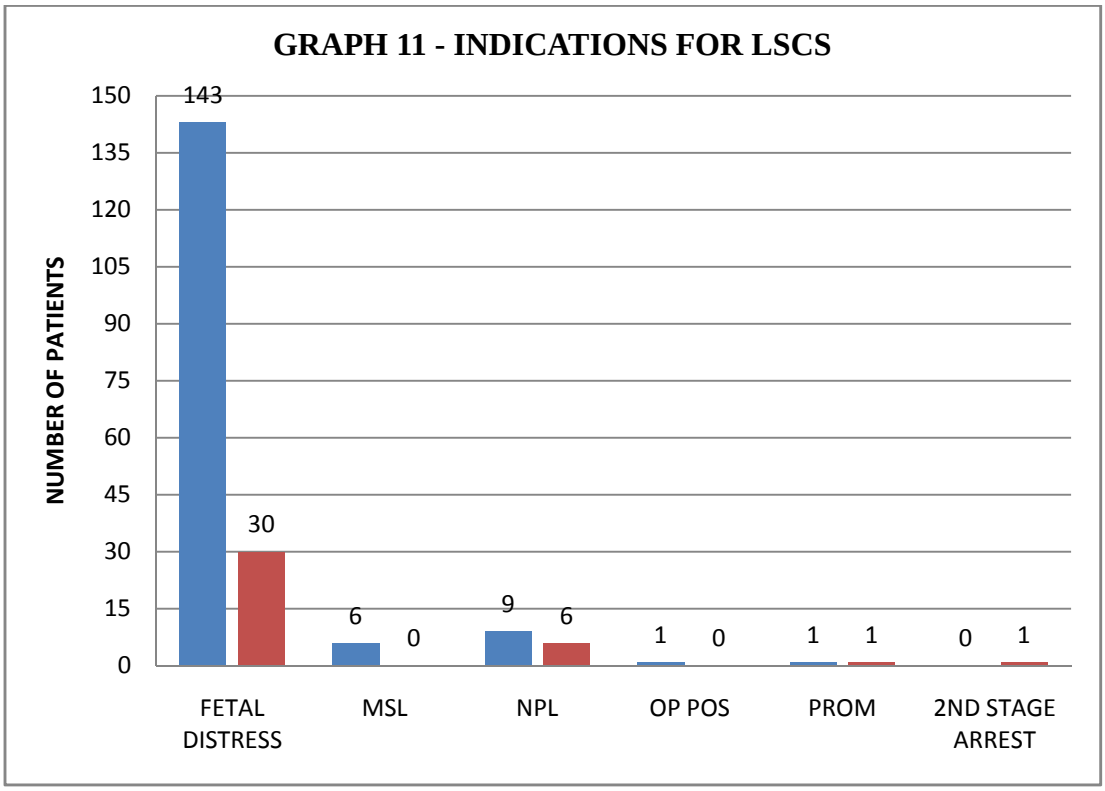

GRAPH 11 - INDICATIONS FOR LSCS
NUMBER OF PATIENTS
150
135
120
105
90
75
60
45
30
15
0
143
30
6
0
9
6
1
0
1
1
0
1
FETAL DISTRESS
MSL
NPL
OP POS
PROM
2ND STAGE ARREST

Table 12. Birth weight

Birth weight(kgs)	Thick (n=196)	Percentage	Thin	Percentage	Total(n=340)	Percentage
</=2.5	65	59.6	44	40.3	109	100.00
>2.5-3.0	82	57.7	60	42.2	142	100.00
>3.0	49	55.0	40	44.9	89	100.00
Chi square test p = 0.81						

Babies weighing </=2.5 kgs were seen in 65 babies (59.6%) in thick meconium and 44 babies (40.3%) with thin meconium stained. Out of 142 babies weighing 2.5-3.0kgs, 82 (57.7%) were thick meconium stained and 60 babies (42.2%) were thin meconium stained. There were 89 babies who weighed more than 3.0kgs and 49 babies (55%) were thick meconium stained and 40 babies (44.9%) were thin meconium stained.

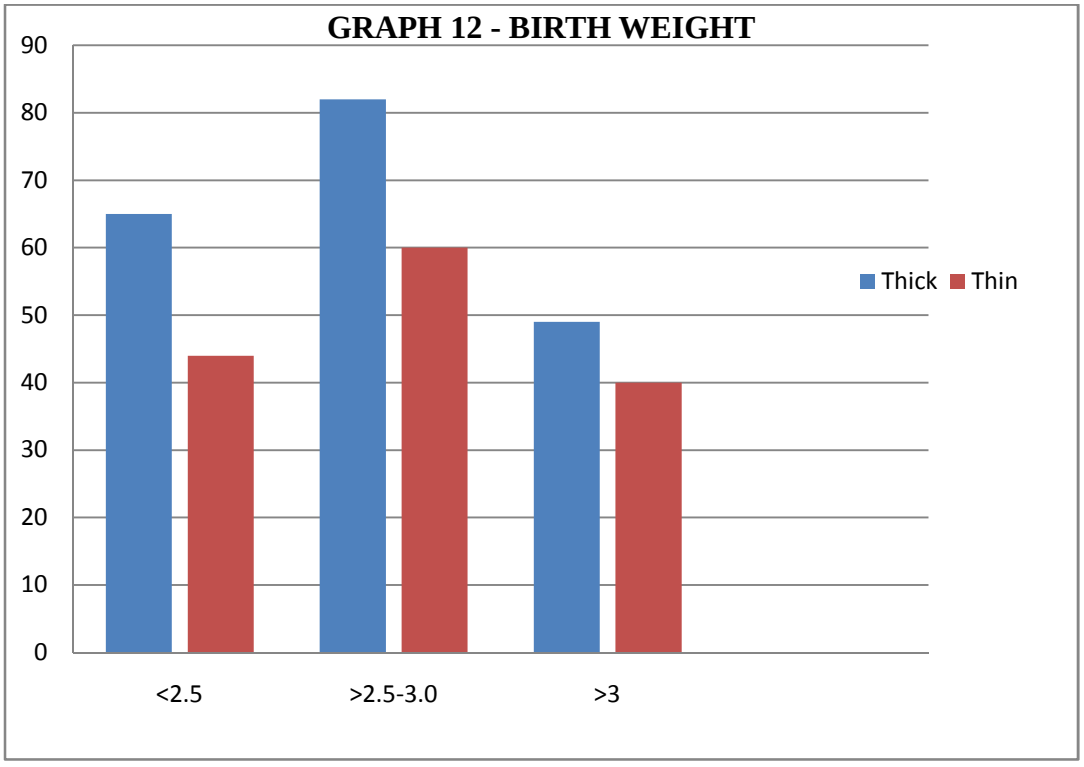


Table 13. Apgar score at 1 minute.

Apgar Score	Thick(n=196) Number	Percentage	Thin (n=144) Number	Percentage	Total (n=340) Number	Percentage
>7	118	52.21	108	47.79	226	100.00
<7	78	68.42	36	31.58	114	100.00
Total	196	57.65	144	42.35	340	100.00
Chi square test p = 0.004						

The incidence of Apgar score at 1 minute >7 for thin and thick meconium was 52.2% and 47.8% respectively. The incidence of apgar score <7 for thin and thick was 68.4% and 31.6% respectively. Lower apgar scores were observed more in thick meconium stained liquor than in thin meconium which was statistically significant.

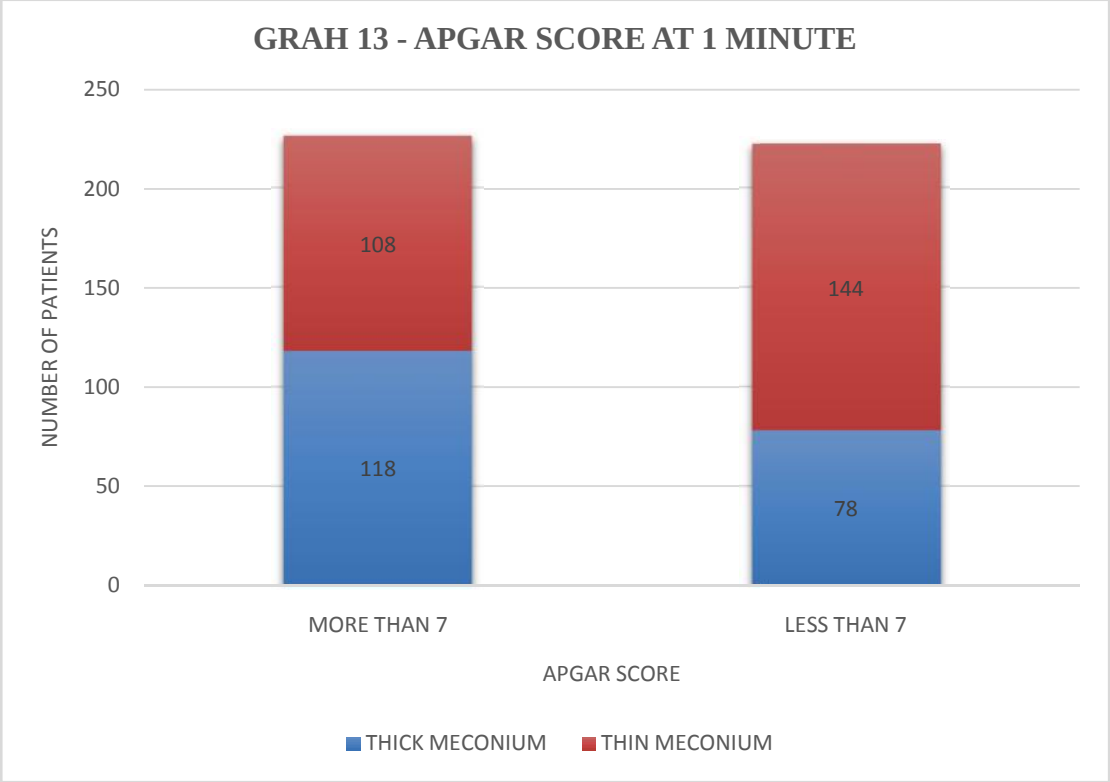


Table 14. Apgar Score at 5 minutes.

Apgar score	Thick (n=196) Number	Percentage	Thin (n=144) Number	Percentage	Total (n=340) Number	Percentage
>7	179	56.29	139	43.71	318	100.00
<7	17	77.27	5	22.73	22	100.00
Chi square test p = 0.054						

Apgar score at 5 minute is mostly >7 in thin meconium i.e., 139 (43.71%) and 179 in thick meconium (56.29%). Apgar score <7 in thin and thick meconium was 5 and 17.

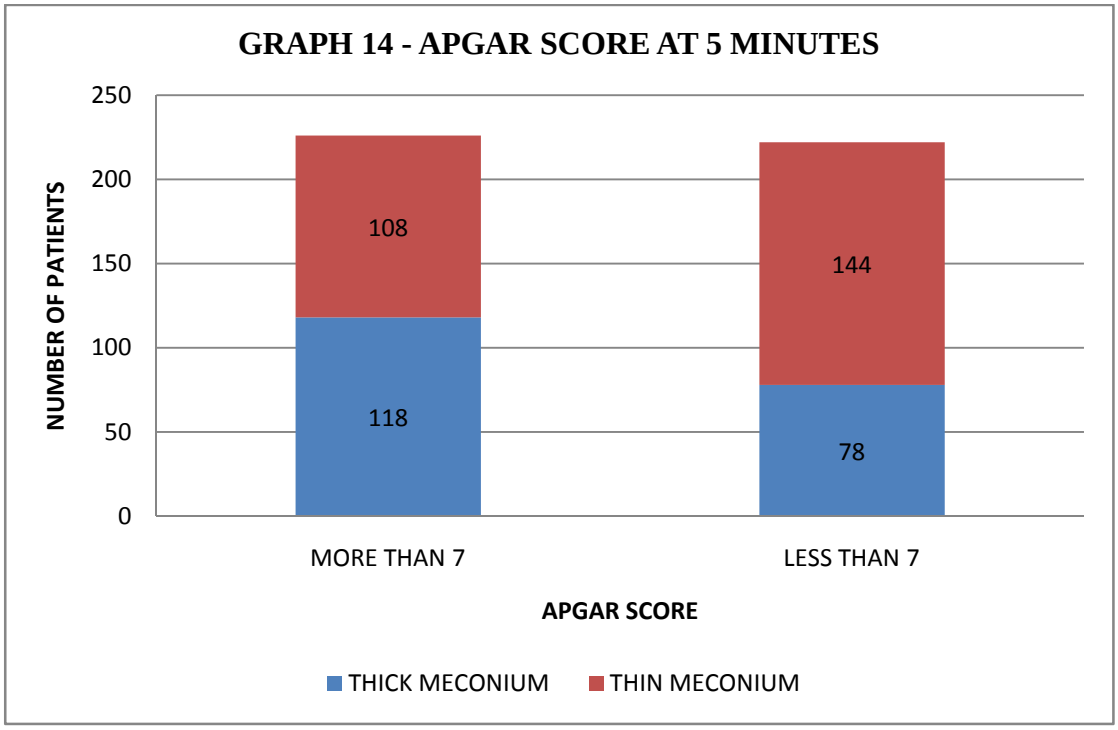


Table 15. NICU admission

Admission	Thick (n=196) Number	Percentage	Thin (n =144) Number	Percentage	Total (n=340) Number	Percentage
Yes	58	76.32	18	23.68	76	100.00
No	138	52.27	126	47.73	264	100.00
Total	196	57.65	144	42.35	340	100.00
Chi square test p = <0.001						

Out of 340 cases, 76 babies needed NICU admissions. Of the 76 babies, 58 babies had thick meconium stained liquor i.e., 76.32% and 18 (23.68%) that thin meconium stained liquor. NICU admission were observed more in thick meconium stained

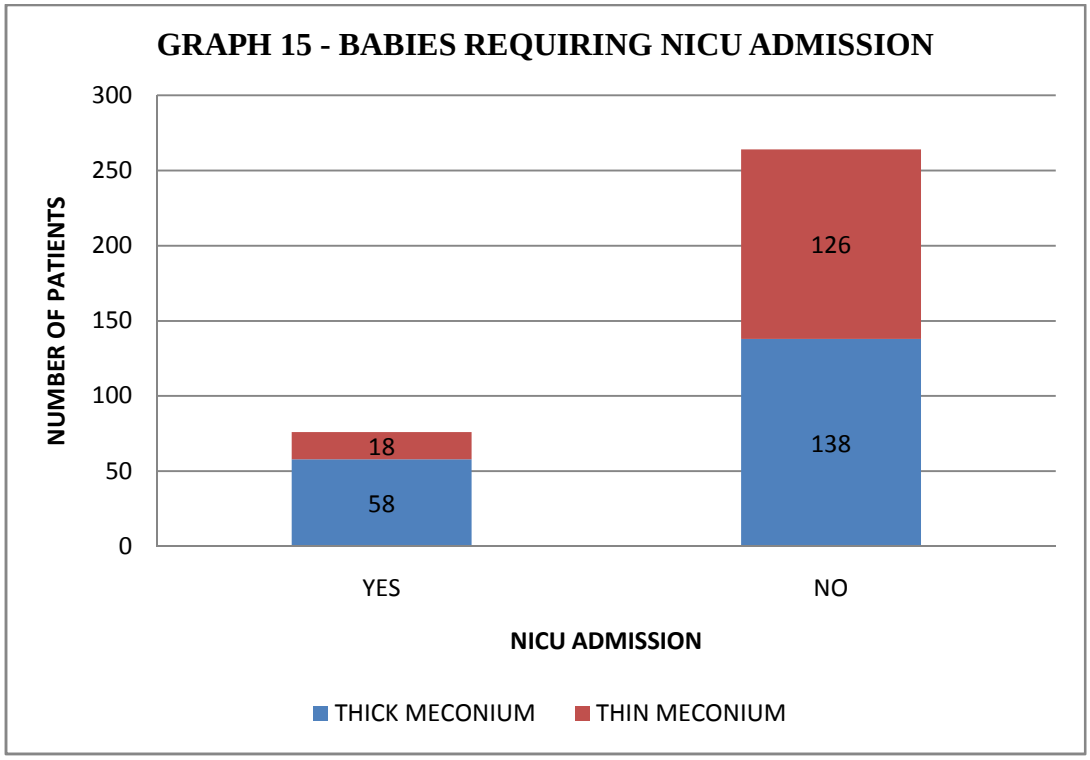
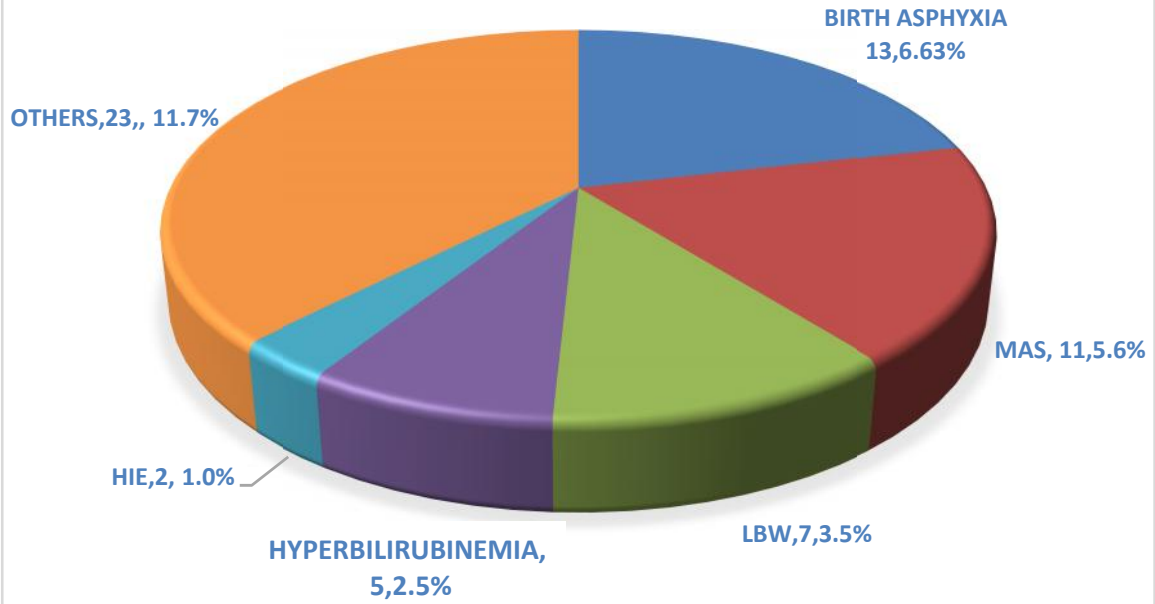


Table 16. Causes for NICU admissions.

Causes	Thick(n=196) Number	Percentage	Thin (n=144) Number	Percentage	Total (n=340) Number	Percentage
Birth asphyxia	13	6.63	4	2.7	17	5
MAS	11	5.6	1	0.6	12	3
Lbw	7	3.5	1	0.6	8	2.3
Hyperbilirubenemia	5	2.5	1	0.6	6	1.7
HIE	2	1.0	0	0	2	0.5
Others	23	11.7	8	5.5	31	9
Chi square test p = 0.753						

Birth asphyxia attributed to 6.63% of NICU admission in thick meconium stained liquor and 2.7% in thin meconium stained liquor. Other causes were MAS 5.6% in thick meconium stained liquor and 0.6% in thin meconium, Low birth weight was seen in 3.5% of thick meconium stained and 0.6% of thin meconium stained, Hyperbilirubinemia was seen in 2.5% of thick meconium stained and 0.6% of thin meconium stained, HIE was seen in 1% of thick meconium stained.

GRAPH 16 A - CAUSES FOR NICU ADMISSION IN THICK MECONIUM STAINED CASES



GRAPH 16 B - CAUSES FOR NICU ADMISSION IN THIN MECONIUM STAINED CASES

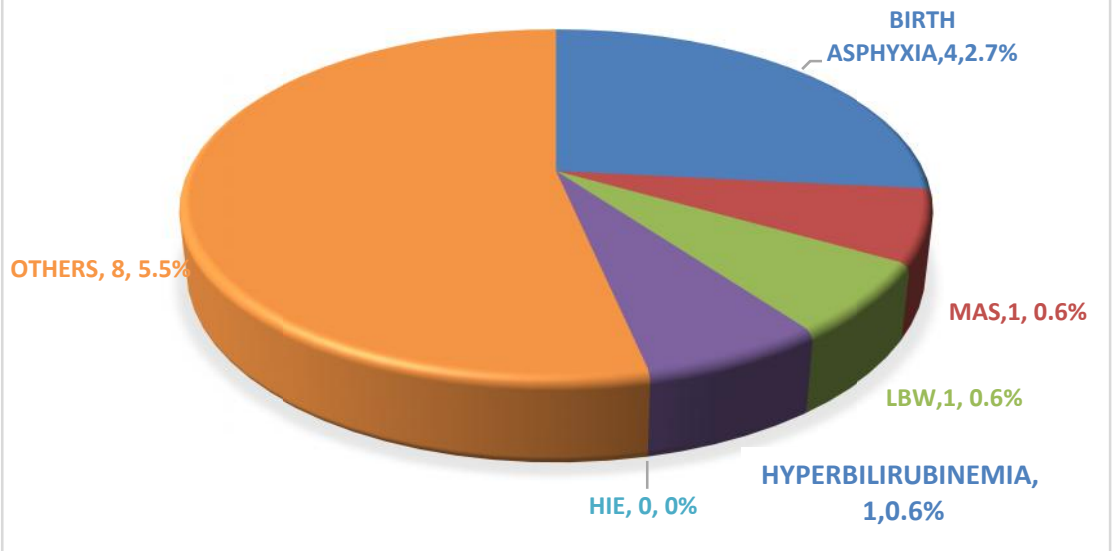


Table 17a.Meconium aspiration syndrome

	THICK	THIN
LSCS	10	1
Vaginal	1	0
Chi square test p = 0.752		

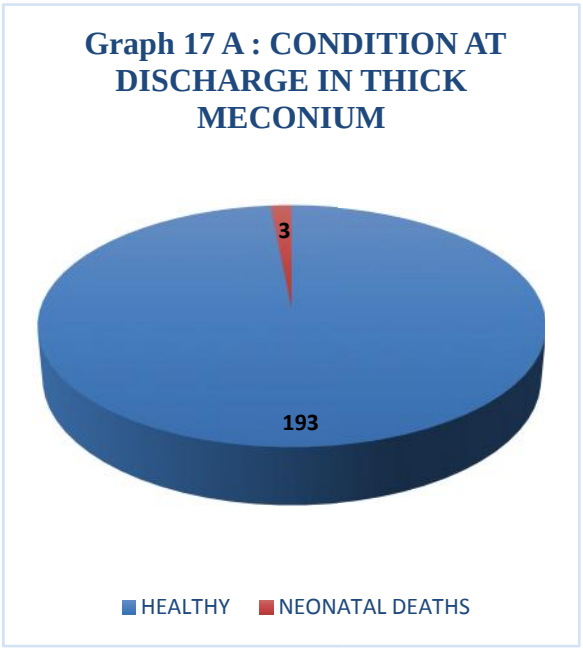
Table 17b.Birth Asphyxia

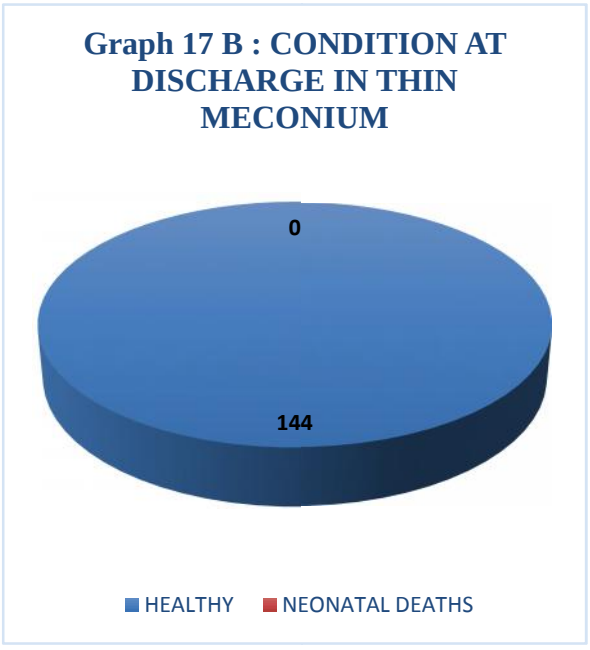
	THICK	THIN
LSCS	9	4
Vaginal	2	2
Chi square test p = 0.48		

Table 18. Condition at discharge.

	Thick(n=196) Number	Percentage	Thin (n=144) Number	Percentage	Total (n=340) Number	Percentage
Healthy	193	57.27	144	42.73	337	100.00
Neonatal Death	3	100.00	0	0.00	3	100.00
Total	196	57.65	144	42.35	340	100.00
p = 0.135						

Out of 340 cases, perinatal mortality was seen in 3 cases in thick meconium stained and no deaths were seen in thinmeconium stained.





DISCUSSION

Meconium passage prior to birth occurs in up to 12-20% of term deliveries, meaning that the frequency of meconium stained amniotic fluid is one for every five deliveries making it a very common finding[40]. Inspite of this the detection of meconium stained amniotic fluid during labor often causes apprehension and anxiety for the health provider as it is often considered an indicator of fetal distress. However the obstetric literature still has many unanswered questions regarding the significance of meconium in the amniotic fluid and the appropriate management protocols that should be followed when it is discovered. Some believe that meconium is triggered by fetal stress such as hypoxia or asphyxia and may be considered an indicator of fetal distress. Others point out that the presence of meconium may be a result of gastrointestinal maturity. Considering all of the above, a significant association has been reported between the consistency of meconium and abnormal fetal heart rate patterns, increased rates of caesarean section, low apgar scores[27, 41-43].

This study was undertaken to have a clear idea on decision making and management of labour complicated with meconium stained liquor and to prognosticate perinatal outcome.

This prospective cross-sectional study enrolled 4047 total deliveries out of which 340 cases met the inclusion criteria. The study showed the incidence of meconium stained amniotic fluid to be 8.5%. Similar observations were made by other workers[31, 41, 44]. However few studies have shown an increased incidence of 20-25% which could be because of no-care mothers attending their hospital[32, 45-46].

The present study showed an increased incidence of thick meconium stained liquor compared to thin meconium stained i.e., 57.65%and 42.35%. Similar observation were found in other studies[25-26]. In another study by Swain et al which included 175 cases of meconium stained amniotic fluid showed 8.57% showing thick meconium stained and 91.5% thin meconium stained[34]. In another recent study by Hosun et al showed 75% of cases having thick meconium stained and 25% having thin meconium stained[27]. There were more number of deliveries complicated with thick meconium stained fluid then thin meconium stained however the association was not statistically significant.

In this study, the commonest age group among the pregnant women was 22-25 years (46.17%) followed by < 21 years (32.0%), 26-30 years (17.9%) and >30 years (0.03%). The mean age was 25.5+/- 3.54 years. Our study was comparable with other studies where the commonest age group was between 20-27 years[26, 38, 40-42,] The association between age and meconium stained amniotic fluid was not found to be statistically significant which gives us an inference that maternal age has no relation with the meconium stained amniotic fluid.

This present study showed a higher incidence of Meconium stained amniotic fluid in primigravida i.e., 61.4% and 38.6% in multigravida. The same result was also found in other studies[38, 43]. In this study 30% of the primigravida were more than 40 weeks of gestation. This proves that there is increased incidence of meconium stained amniotic fluid in primigravida which could be due to increased period of gestation and more duration of labour.

The mean gestational age was39.13+/-1.3 weeks in the present study comparable to a study done by Swain et al i.e.,41.20+/-1.80 weeks[34]. Khatun in his

study found mean gestational age of 39.3+/- 1.5 weeks[27] and Rosario found mean gestational age of 39.62 weeks indicating as gestational age progresses towards postdatism the incidence of meconium staining is high[47]. Suno et al found a significant increased rate of meconium in amniotic fluid at 39 weeks[48]. In our study 26% and 2% of cases were post dates and post term which substantiates that meconium staining in amniotic fluid increases with gestational age which can be explained that the hormone motilin is secreted in increasing quantities by the fetus as gestational age advances and most meconium discharges are said to occur in postdated gestations, because the motilin levels are highest then[49.]

In our study 74.1% of cases had risk factors associated with them whereas 25.9 had no risk factors. The most common risk factors post datism, IUGR, pregnancy induced hypertension, post term, oligohydramnios. In our present study, post datism accounted for 26%, IUGR 8.8%, PIH 11.7%, oligoamnios 3.8%, post term 3%. In other studies post datism attributed to majority of cases followed by pregnancy induced hypertension 20%, intrauterine growth restriction 8% and oligoamnios 10%32, [39, 50-52]. However in a study done by Hosna Ara Khatun et al pregnancy induced hypertension was quite high[27]. This supports the theory that as gestational age advances, due to physiological maturation of gut there is meconium discharge which results in meconium stained amniotic fluid.

Overall increased percentage of cardiotocographic abnormality was seen more in thick meconium stained than in thin meconium which helped us in early detection of fetal distress. In the present study CTG was pathological especially in thick meconium accounting for 73.6% compared to thin meconium 26.4%. This difference was found to be statistically significant ($p<0.001$) and also accounting for increased

incidence in operative interventions comparable to a study done by Meena et al which showed 44% had reactive CTG and 56% had non-reactive CTG[51]. Another study showed fetal heart rate variations were more commonly seen in thick meconium group as compared to thin meconium group (86.36% versus 9.75%)[38]. Many other researchers have reported an increased incidence of abnormal fetal heart rate patterns in presence of MSAF[26, 38-40, 45, 52.] There were more fetal heart rate abnormalities in labour complicated with thick meconium stained amniotic fluid than thin meconium stained amniotic which was found be statistically significant.

There was increased incidence of operative delivery in the present study i.e., overall percentage of LSCS was high due to fetal distress detected by cardiotocographic abnormality. In the present study the incidence of LSCS was higher i.e., 58.8% which was found to be statistically significant ($p<0.001$) and 33.8% were vaginal deliveries followed by instrumental delivery 7.4%. Operative interventions were more in thick meconium stained liquor then in thin meconium stained liquor whereas vaginal deliveries were more seen in thin meconium stained liquor. More cases of thick meconium stained liquor (136) were diagnosed early in labour and hence delivery was expedited by lower segment caesarean section. This was found to be statistically significant ($p<0.001$). However thin meconium stained liquor was diagnosed late in labour (93) and hence vaginal delivery was carried out. This study was comparable with other studies[26, 32-33, 38-41, 51, 53, 61]. The higher rate may be due to lack of facilities such as fetal scalp pH monitoring. The increased rate tells us the association of abnormal fetal heart rate patterns associated with meconium stained amniotic fluid. However in a study done by Wong et al, 13.2% of MSAF had undergone caesarean section compared to 8.8% cases who had undergone in clear amniotic fluid which could be due to incorporation of scalp pH sampling in their

study[54]. This proves that patients with MSAF need strict supervision during labor for better perinatal outcome.

In this present study fetal distress was found to be high i.e., 50.8%, the other causes being Meconium stained liquor 1.76%, Non progress of labour being 4.41%, Persistent occipito posterior 0.29%, Premature rupture of membranes 0.59% and Second stage arrest 0.29%. Gupta et al[45,55] also found fetal distress to be significantly high in pregnancies with MSAF and therefore careful monitoring of fetal wellbeing during labour may go a long way in preventing MAS.

Babies weighing </=2.5 kgs were seen in 65 babies (59.6%) in thick meconium and 44 babies (40.3%) with thin meconium stained. Out of 142 babies weighing 2.5-3.0kgs, 82 (57.7%) were thick meconium stained and 60 babies (42.2%) were thin meconium stained. There were 89 babies who weighed more than 3.0kgs and 49 babies (55%) were thick meconium stained and 40 babies (44.9%) were thin meconium stained. There was no significant difference observed in terms of birth weight. Similar studies have shown the same result[40].

In the present study the Apgar score at 1 minute in thin meconium stained was >7 in 52.21% of cases and remaining 47.79% were thick meconium stained. The Apgar score <7 was seen 68.42% of thick meconium stained and 31.58% of thin meconium stained depicting that lower Apgar scores were observed more in thick meconium stained liquor then in thin meconium. However the Apgar score at 5 minutes was >7 in 43.71% of thin meconium and 56.29% in thick meconium. The Apgar score <7 in 77.27% of thick meconium and 22.73% of thin meconium. More number of babies with thick meconium stained liquor had lower apgar scores at 1 and 5 minutes which was found to be statistically significant(p-0.004). In similar study

done by Meena priyadarshini showed 1 minute Apgar score >7 in 63.5% of cases with Thick meconium stained and 36.5% in thin meconium stained, Apgar score < 7 was seen in 74% of thick meconium stained and 26% of thin meconium stained[51]. Another study showed lower 1 minute and 5 minute Apgar scores in thick meconium stained[38].Wiswell at al found significantly lower one minute Apgar score but not in five minutes[7].Sedaghatian et al[56], Patil et al[41], Oyelese et al[57] and Mst. Hosna Ara Khatun[27] et al had significantly lower five minute Apgar scores. However Becker found no statistically relevant difference in the Apgar score[58].The low Apgar scores may be because of direct vasoconstrictor effect of meconium on umbilical vein that results in vasospasm leading to impaired placental blood flow[59].

Many babies required NICU admission for observation of respiratory distress and were observed for 24 hours and discharged from the Neonatal intensive care unit. Conditions like birth asphyxia was a common complication followed by meconium aspiration syndrome which required longer duration of stay in NICU.

In the present study of 340 cases, 76 babies needed NICU admissions. Of the 76 babies, 58 (76.32%) had thick meconium stained liquor and 18 (23.68%) had thin meconium stained liquor. The admission were found to be statistically significant in babies with thick meconium stained liquor as they were more in thick meconium stained liquor then in thin meconium stained liquor ($p<0.001$). The most commons cause was birth asphyxia which was 6.63% in thick meconium stained and 2.7% in thin meconium stained, meconium aspiration syndrome was 5.6% in thick meconium stained and 0.6% in thin meconium stained, low birth weight was 3.5% in thick meconium stained and 0.6% in thin meconium stained, hyperbilirubinemia 2.5% in

thick meconium, 0.6% in thin meconium stained, HIE in 1% in thick meconium stained. No specific indication was found to be statistically significant.

In the present study, Meconium aspiration syndrome was diagnosed in 3% of babies with MSAF and they were seen more in thick meconium stained liquor similar to Naqvi et al who reported incidence of 4% MAS[25] but contrary to ours, Patil et al reported 12.8% MAS[41]. Meconium aspiration was the cause of death in cases.

In the present study, mortality was 1% leading cause of death being meconium aspiration syndrome with low birth weight. Debdas et al showed 3% perinatal mortality[60]. Khatun et al showed 2.9% mortality in meconium stained amniotic fluid[27]. Gupta et al found 4.9%mortality in meconium stained amniotic fluid and the leading cause[57]. In this study there was a higher number of caesarean section in patients with thick meconium stained which was proven to be statistically significant however the perinatal outcome was not to be found statistically significant.

CONCLUSION

This study concludes that meconium stained fluid is matter of concern both to the obstetrician and the pediatrician as it is associated with increased operative intervention, lower Apgar scores, increased risk of birth asphyxia and meconium aspiration syndrome, increases neonatal intensive care unit admissions. Thick meconium stained amniotic fluid is associated with increased incidence of lower segment caesarean section. Majority of women who were thick meconium stained liquor were identified early in labour and thereby delivery was expedited by either vaginal delivery or by lower segment caesarean section whichever is earliest. Fetal heart rate abnormalities are also more common in thick meconium stained liquor. However perinatal outcome didn't differ in both the groups. Identification of women at risk of meconium stained amniotic fluid and also the presence of meconium stained amniotic fluid is important as it warrants a strict intrapartum surveillance. Once identified, close monitoring of the fetus with cardiotocography becomes a compulsion and any fetal heart rate abnormalities demands an immediate operative intervention and need for a skilled pediatrician at the time of delivery to decrease perinatal morbidity and mortality.

SUMMARY

The present study was conducted in the Department of Obstetrics and Gynecology, KLES Prabhakar Kore Hospital and MRC, Belgaum after obtaining an approval from institutional ethics committee and written informed consent.

- 340 cases of meconium stained liquor meeting the inclusion criteria were taken to evaluate the mode of delivery and perinatal outcome
- Meconium stained were classified into two groups based of type of stained – thick and thin.
- Out of 340 cases, thin meconium staining were seen in 144 cases (42.35%) and thick meconium staining were seen in 196 cases (57.65%)
- Parity and maternal age were independent risk factors for type of meconium stained amniotic fluid, however meconium stained amniotic fluid was found to more in primigravidas which could be due to increased gestational age and more duration of labour.
- Mean gestational age was 39.3+/-1.29 weeks.
- Mean age of the mother was 25.5+/- 3.54 years.
- 32% mothers were less than 22 years, 46% were between 22-25, 17 % were between 26-30 , 3% between 31 -35.
- 61.4% were primigravida and 38.5 % were multigravida telling us that the incidence of Meconium stained amniotic fluid is seen more in primigravida.

- MSAF was seen more in cases of Postdatism (25.5%) followed by pre-eclampsia – 11.7%, IUGR – 8.8%, Oligohydramnios – 3.8%.

- Fetal heart rate abnormality was seen more in cases of thick meconium stained accounting for 73.6% compared to thin meconium 26.4%

- Lower segment caesarean section was seen more in cases with thick meconium stained liquor diagnosed in early labour (99%) whereas more number of thin meconium stained amniotic fluid who were diagnosed late in labour were delivered vaginally (95%)

- 79.5% in thick meconium stained had operative intervention as compared to thin meconium stained i.e., 20.5% and 22.6% of thick meconium stained liquor had vaginal deliveries and 77.39% in thin meconium stained liquor.

- Babies weighing </=2.5 kgs were seen in 65 babies (59.6%) in thick meconium and 44 babies (40.3%) with thin meconium stained. Out of 142 babies weighing 2.5-3.0kgs, 82 (57.7%) were thick meconium stained and 60 babies (42.2%) were thin meconium stained. There were 89 babies who weighed more than 3.0kgs and 49 babies (55%) were thick meconium stained and 40 babies (44.9%) were thin meconium stained.

- Number of babies requiring NICU were 58 in thick meconium stained (76.32%) and 18 (23.68%) in thin meconium stained. Most of the admission were required for observation for respiratory distress.

- Most of the NICU admission were due to birth asphyxia followed by Meconium aspiration syndrom , low birth weight , hyperbilirubinemia, Hypoxic ischaemic encephalopathy.

- The incidence of MAS was 3%. MAS was seen more in thick meconium stained liquor then in thin meconium stained liquor.

- 1% perinatal mortality was observed and MAS was the leading cause of death.

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ANNEXURE - I

INFORMED CONSENT FORM

I.D.NO.

"MECONIUM STAINED AMNIOTIC FLUID AND PERINATAL OUTCOME: A ONE YEAR PROSPECTIVE CROSS-SECTIONAL STUDY."

The study is conducted by Dr. _____ Post graduate student in M.S Obstetrics and Gynecology under guidance of Dr._____, Professor of OBG, J. N. Medical College.

Respected Sir/Madam, We invite you to participate in our study as you are eligible for the same. During the study you will be asked some questions in detail regarding your present complaints.

Purpose of the study:

The purpose of this study is to study the Intrapartum management of meconium stained amniotic liquor. All patients who fulfill the inclusion criteria will be requested to participate in this study during the period of one year.

Procedure and treatment:

Should you choose to participate, you will be asked to give a detailed history, undergo a physical examination, and consent to a few routine investigations.

Risks and benefits:

You may undergo some amount of discomfort during the process of investigations, which may include slight pain. However all necessary steps and precautions will be taken to ensure your safety. The result of you taking part in this

research would help health care providers towards a better understanding of the different management practices and the outcome, and thus we will be able to provide improved patient care.

Alternatives:

If you decide not to participate in this study, you will still be receiving the usual standard care.

Privacy and confidentiality:

Your privacy will be respected and all information collected about you during the course of this study will be kept confidential. Your identity will remain undisclosed.

Relations with the Institutional policy:

The J N Medical College will provide, within the limitations of the laws of the State of Karnataka, facilities and medical attention to patients who suffer injuries as a result of participating in this project. In the event if you suffer any physical injury as the result of your participation in this study, you may contact Dr. _____, or Dr._____. In the event of an emergency, you should contact _____.

Financial incentives:

You shall not be receiving any payment or any financial incentives for participating in this study.

Authorization to publish results:

The results of this study may be published for scientific purpose or presented to a scientific group. Your identity, however, will be maintained confidential at all times.

Voluntary participation:

Your participation in this study is voluntary. Your decision whether or not to participate will neither affect the care of your current disease, nor your future relations with the doctor or the hospital. In case you need further information regarding your rights as a study participant, you may please contact Dr._____, Chairperson, and Institutional Ethics Committee for Human Research.

STATEMENT OF CONSENT:

I.D.NO: | | | |

I Mr/Ms/Mrs

_____

Volunteer and consent to participate in this study. I have read the consent document or it has been read to me in my vernacular language. I accept to participate in the study. All the information regarding this study is provided to me and I have understood the same. I have been given the opportunity to ask questions and obtain appropriate answers.

Participant's name:

Signature or left thumb print of participant:

Witness name:

Signature of witness:

Signature of the investigator:

Date:

If the participants are Minors (under 18), the parents sign the form, rather than the participants.

ANNEXURE II – PROFORMA

PROFORMA

Cross sectional study to assess the intrapartum management of meconium stained amniotic fluid:

S.I. No. Date: Time:

OP/IP No. Registered/ not registered:

Patients Name

Age

Address

Contact no:

Obstetric History

G: P: L: A: D:

Married Life

Menstrual History

LMP

EDD

Period of Gestation

General Physical Examination:

Height (cms): Weight (kgs): BMI: Pulse: B.P:

Pallor Pedal edema Icterus Thyroid swelling

CVS:

RS:

P/A:

Fundal Height: Estimated fetal weight:

FHS

Rate:

Regular:

P/V:

Diagnosis:

Investigations:

Hemoglobin - CTG FINDINGS:

Blood Group –

HIV –

HbsAg –

Urine Routine -

Microscopy –

USG Parameters:

BIPARIETAL DIAMETER:

FEMUR LENGTH:

ABDOMINAL CIRCUMFERENCE:

CARDIAC ACTIVITY:

PLACENTA:

AMNIOTIC FLUID INDEX:

GESTATIONAL AGE:

EXPECTED DATE OF DELIVERY:

ESTIMATED FETAL WEIGHT:

Labour details:

State of membranes:

Colour of Liquor

I (intact)

C (Clear)

M (Me conium)

Thick-

Thin-

Cervical Dilation:

Descent of head:

Uterine Contractions:

Drugs and fluids:

B.P (2 hourly):

Pulse Rate (2 hourly):

Oxytocin concentration added:

Urine analysis:

Temperature Record:

Oxygen Inhalation:

Left lateral position:

Mode of delivery and time:

Duration between detection of Meconium stained amniotic fluid and delivery of fetus:

Mechanical oral and nasopharyngeal suction before and at infant's first breath were recorded:

NEONATAL DETAILS:

Mode of delivery: Date:

Vaginal

Instrumental

LSCS Sex: Time:

Apgar score Pulse Rate:

Respiratory rate:

1minute-

5minute-

Birth weight:

Presence or absence of meconium confirmed by the presence or absence of meconium below the vocal cords on laryngoscopic examination and endotracheal suction:

Neonatal respiratory distress:

Radiological Evidence of patchy densities of Meconium Aspiration Syndrome:

NICU Admission:

If yes, how many days?

Reason for admission:

Condition at discharge:

ANNEXURE III

PHOTOGRAPHS

Figure 1. Showing baby oropharyngeal sanctioning of baby delivered through meconium stained amniotic fluid

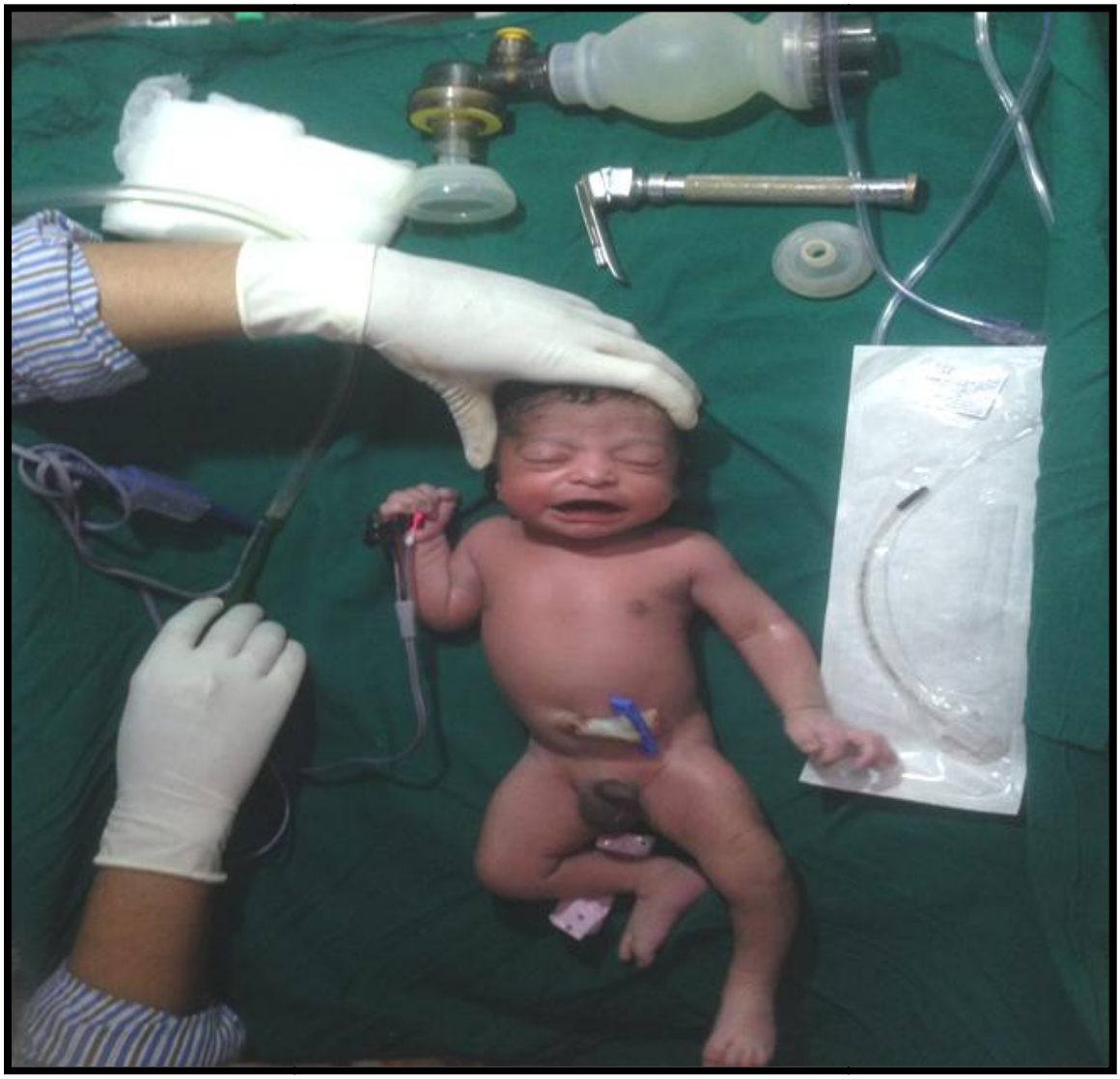

Figure 2. Showing baby oropharyngeal sanctioning of baby delivered through meconium stained amniotic fluid

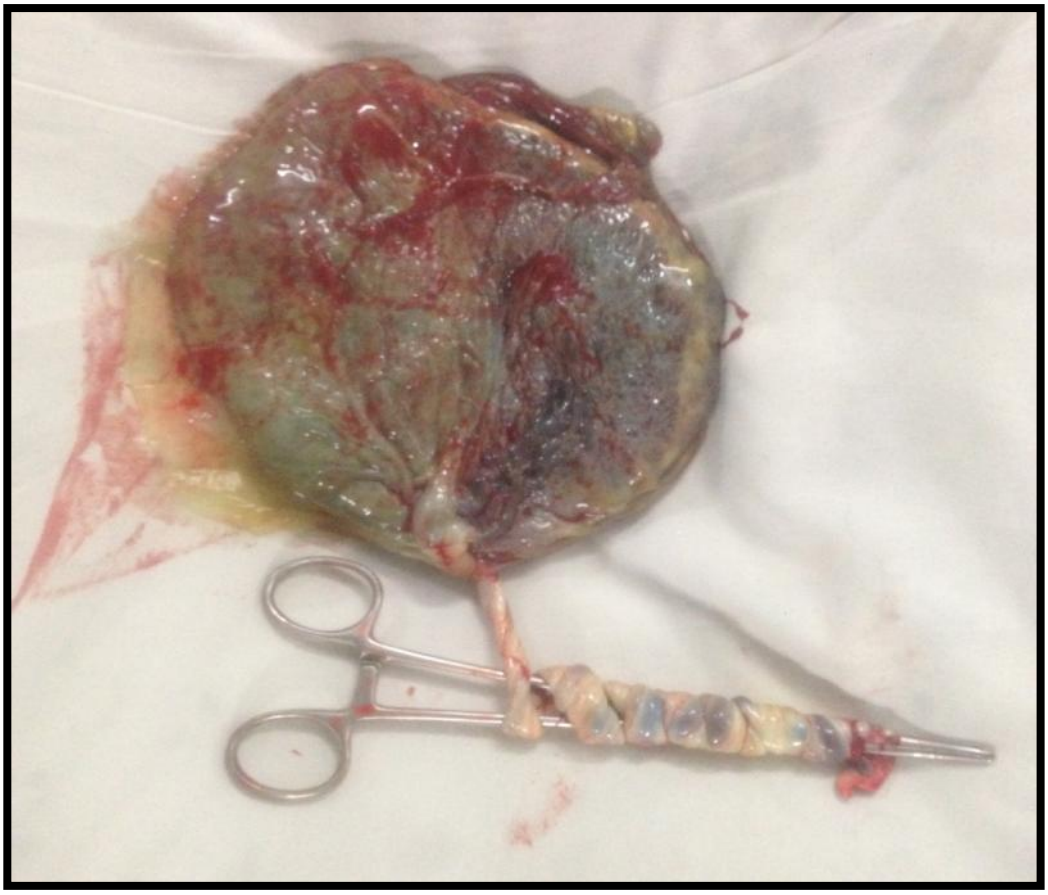

Figure 3. Meconium stained placenta

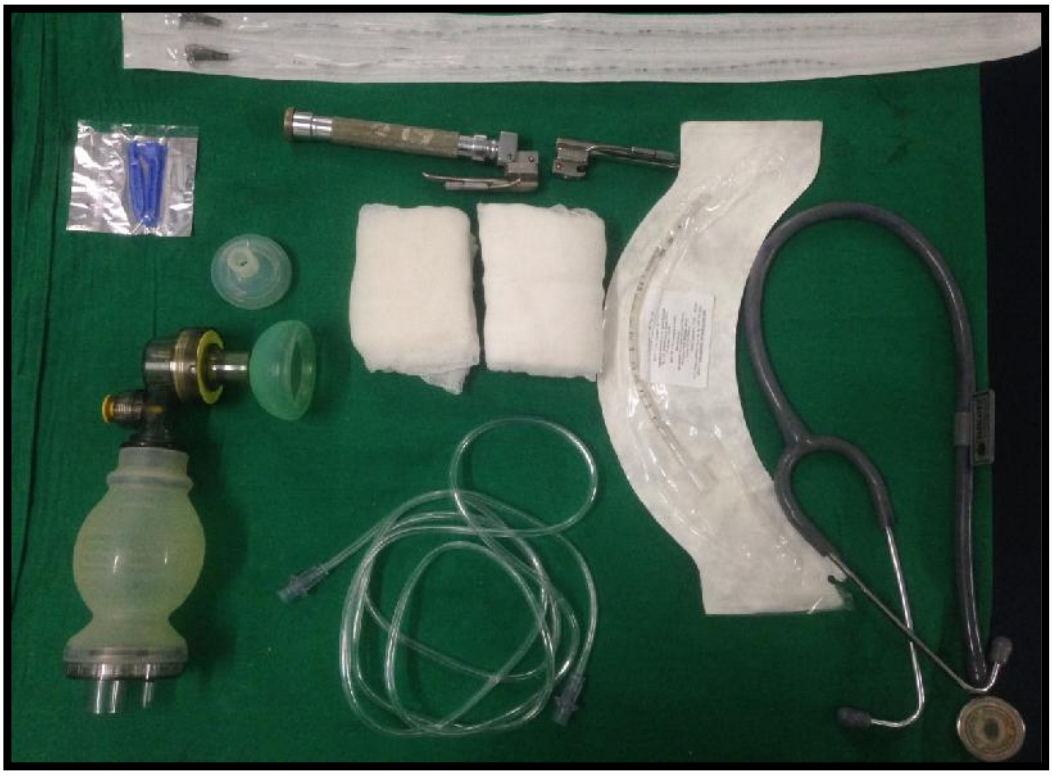

Figure 4. Instruments used for new born baby resuscitation

ANNEXURE IV

KEY TO MASTER CHART

APE	-	Antepartum eclampsia
Assym	-	Asymmetrical
BOH	-	Bad Obstetric History
DIPSI	-	Diabetes in pregnancy Study group India
EROM	-	Early rupture of membranes
Gest HTN	-	Gestational Hypertension
HIE	-	Hypoxic Ischemic Encephalopathy
IUGR	-	Intrauterine Growth Retardation
K/C/O	-	Known case of
Lbw	-	Low Birth weight
LSCS	-	Lower Segment Caesarean Section
MS	-	Mitral Stenosis
Multi	-	Multigravida
NPL	-	Non Progress Of Labour
OP	-	Occipito Posterior
PDA	-	Patent Ductus Arteriosus

Primi	-	Primigravida
PROM	-	Premature Rupture of Membranes
PV	-	Per Vaginum
PIH	-	Pregnancy induced hypertension
RHD	-	Rheumatic Heart Disease
TK	-	Thick
TN	-	Thin

Serial Number	In Patient Number	Age (Years)	Parity	Period gestation	Risk factors	Adm. CTG	thick/thin	PV on diagnosis	CTG before shifting	Mode of delivery	time interval	Sex	Weight (Kgs)	Apgar score 1 Minute	Apgar score 5 Minute	NICU	ph	days in hospital	condition at discharge
1	512162	22	Primi	38	Assym IUGR	reactive	TK	1	late decceleration	LSCS	intraop	male	2.3	7	8	yes lbw	7.21	4	healthy
2	512458	22	Multi	37.2		reactive	TK	2	early decceleration	LSCS	intraop	female	2.5	8	9	no	7.3	4	healthy
3	512796	22	Primi	37	-	reactive	TK	1.5	prolonged decceleration s	LSCS	40mins	male	2.2	8	9	no	7.23	7	healthy
4	543435	30	Multi	37.5	-	reactive	TN	os closed	reactive	LSCS (NPL)	intraop	male	2.5	7	8	no	-	10	healthy
5	517009	20	Multi	39	olihydramnios	reactive	TK	3	late decceleration	LSCS	3hrs	male	2.3	6	7	no	7.33	6	healthy
6	517468	20	Primi	37.6	prom	reactive	TN	3	reactive	LSCS	2hrs	male	3.5	7	8	no	-	7	healthy
7	516084	28	Multi	39.4	oligohydramnios	reactive	TK	3	early decceleration	vaginal	1hr 40mins	female	3.2	6	7	yes MAS	-	12	healthy
8	515991	32	Primi	40.4	precious pregnancy with post datism	reactive	TK	2	late decceleration	LSCS	intraop	male	2.7	7	8	no	7.24	6	healthy
9	515855	23	Primi	40.2	severe pih with post datism	reactive	TK	3	normal	LSCS(NPL)	intraop	female	3	7	9	no	7.3	8	healthy
10	516012	35	Primi	41	post datism	non reactive	TK	os closed	prolonged decceleration s	LSCS	intraop	male	2	5	6	yes (MAS)	7.1	7	healthy
11	514359	22	Primi	39.2	-	reactive	TN	4	reactive	LSCS(NPL)	9 hrs	female	3	7	8	no	Multi	8	healthy
12	515963	21	Primi	42.4	severe PIH with post term	reactive	TK	3	reactive	LSCS	1 hr	female	3.2	7	8	no	7.34	6	healthy
13	502059	24	Primi	37	k/c/o RHD WITH MS	reactive	TN	1.5	variable deccelerations	LSCS	intraop	female	2.5	6	8	no	7.28	5	healthy
14	502682	22	Multi	38.5	-	reactive	TK	4	late decceleration	LSCS	55 mins	male	3	5	7	no	7.3	5	healthy
15	504871	20	Primi	39.5	EROM	reactive	TK	3	late decceleration	LSCS	16 mins	male	2.7	7	8	no	7.34	7	healthy
16	505164	20	Multi	37.3	-	reactive	TN	10	reactive	vaginal	0 mins	male	3	7	8	no	-	4	healthy
17	505304	21	Primi	39.4	-	reactive	TK	4	reactive	ventouse vaginal	7 hrs	female	2.8	5	6	yes (observation)	-	5	healthy
18	503150	20	Primi	40.1	post datism	reactive	TK	10	reactive	vaginal	5mins	female	2.5	7	8	no	-	4	healthy
19	507303	21	Primi	37	PROM	reactive	TK	7	prolonged decceleration s	vaginal	half hr	female	2.5	6	7	no	-	5	healthy
20	503153	27	Primi	39	-	reactive	TK	2	prolonged decceleration s	LSCS	intraop	female	2.65	7	8	yes (observation)	7.3	6	healthy
21	500898	21	Primi	39.3	-	reactive	TK	2	late decceleration	LSCS	Multi	20mins	2.6	5	6	yes(intubated and extubated)	7.24	5	healthy
22	523268	23	Multi	37.3	PROM	reactive	TK	2	reactive	LSCS(prolonged PROM)	3hrs	male	4	7	9	no	-	8	healthy
23	522639	21	Primi	39	-	reactive	TK	10	reactive	ventouse vaginal	5mins	male	3.2	6	8	yes(observation)	-	5	healthy
24	522259	23	Multi	37.5	EROM	reactive	TK	1	variable deccelerations	LSCS	2hrs 37mins	male	2.5	6	7	no	7.3	8	healthy
25	510716	20	Primi	40		reactive	TK	10	reactive	vaginal	5mins	male	2.6	7	8	no	-	4	healthy
26	518439	22	Multi	37	-	reactive	TK	2	variable deccelerations	LSCS	30mins	male	2.6	7	8	no	7.28	5	healthy
27	523427	23	Primi	39.1	severe pih	reactive	TK	6	reactive	LSCS(NPL)	intraop	male	3	7	8	no	-	8	healthy
28	524377	22	Primi	37		non reactive	TK	3	non reactive	LSCS	intraop	female	2.5	7	8	no	7.33	5	healthy
29	524564	20	Primi	37		reactive	TK	10	reactive	vaginal	25mins	male	2.6	6	8	no	-	5	healthy
30	523962	30	Primi	39.3	-	reactive	TN	10	reactive	vaginal	15mins	male	2.4	6	7	no	-	5	healthy
31	547576	20	Primi	39.6	-	reactive	TK	10	early decceleration	ventouse vaginal	0 mins	female	2.6	6	7	yes (observation)	-	6	healthy
32	546308	19	Primi	39	-	reactive	TK	10	reactive	vaginal	0mins	female	2.8	6	7	yes (hyperbilirubinemia)	-	10	healthy
33	547226	24	Multi	37.1	-	reactive	TK	os closed	late decceleration	LSCS	intraop	male	2.3	6	7	no	-	6	healthy
34	547680	25	Multi	37.3	-	reactive	TK	2	variable deccelerations	LSCS	intraop	female	2.8	6	7	no	7.32	6	healthy
35	547728	21	Primi	37.4		reactive	TK	2	variable deccelerations	LSCS	1hr10mins	male	3	7	8	no	7.28	8	healthy
36	552784	22	Multi	37		reactive	TN	10	reactive	vaginal	10mins	female	3.1	7	8	yes	-	4	healthy
37	550111	25	Multi	37.5	Severe PIH	reactive	TK	1	variable deccelerations	LSCS	intraop	female	2.6	5	6	yes (observation)	7.3	8	healthy
38	545112	24	Multi	39.2	-	reactive	TN	2	late decceleration	LSCS	30mins	female	2.8	7	8	no	7.33	6	healthy
39	543783	20	Primi	39.3	Assym IUGR	reactive	TK	2	late decceleration	LSCS	30 mins	male	2	6	7	yes (lbw and observation)	7.3	13	healthy
40	543146	24	Primi	39.4	prom	reactive	TN	3	reactive	LSCS(prolonged PROM)	1hr	female	2.2	8	9	yes (lbw)	-	10	healthy
41	543115	22	Primi	40.3	post datism	reactive	TK	8	reactive	LSCS(Persistent OP position)	Multi	female	3.8	5	7	no	-	5	healthy
42	543054	22	Primi	40.6	post datism	reactive	TK	3	reactive	LSCS(NPL)	intraop	female	2.65	7	9	no	-	5	healthy
43	542942	26	Multi	38.3		reactive	TN	10	reactive	vaginal	1min	female	3	7	8	no	-	4	healthy
44	542810	25	Primi	38.4	PROM	reactive	TN	10	early decceleration	vaginal	0 mins	female	2.5	7	8	no	-	4	healthy
45	542165	21	Primi	37	Assym IUGR	reactive	TK	2	prolonged decceleration s	LSCS	20mins	female	1.7	5	6	yes (on oxygen)	7.27	24	healthy
46	542502	19	Multi	41.2	post datism	reactive	TK	10	reactive	vaginal	10mins	female	2.6	7	8	no	-	3	healthy
47	542162	26	Multi	41.3	post datism	reactive	TK	3	variable deccelerations	LSCS	50mins	female	2.7	6	7	yes(observation)	7.3	8	healthy
48	541601	24	Primi	38	impaired DIPSI	reactive	TK	2	late decceleration	LSCS	20mins	female	3	7	8	no	7.23	5	healthy
49	541535	21	Multi	41.4	post datism	reactive	TK	8	reactive	vaginal	10mins	male	3	6	7	no	-	4	healthy
50	541660	28	Multi	39	-	reactive	TN	10	reactive	vaginal	5mins	male	2.8	6	7	yes (observation)	-	10	healthy
51	541348	20	Multi	40.6	post datism	reactive	TN	7	reactive	vaginal	1hr	male	3	8	9	no	-	4	healthy
52	546765	22	Primi	40.5	assym iugr with oligo with post datism	prolonged decceleration s	TK	os closed	prolonged decceleration s	LSCS	intraop	female	2.6	7	8	NO	7.28	5	healthy
53	540882	21	Primi	38.3		reactive	TN	10	early decceleration	vaginal	during delivery	female	2.5	8	9	no	-	4	healthy
54	541364	24	Multi	38.4	-	reactive	TN	10	reactive	vaginal	10mins	male	2.4	8	9	NO	-	4	healthy
55	540324	20	Primi	40.3	post datism	reactive	TN	8	reactive	vaginal	40mins	male	2.7	7	9	no	-	5	healthy
56	540926	24	Primi	38		reactive	TK	3	late decceleration	LSCS	intraop	female	2.8	8	9	NO	-	5	healthy
57	539953	24	Primi	40		reactive	TK	2	late decceleration	LSCS	intraop	male	1.8	7	8	yes(lbw)	7.1	15	healthy
58	539857	28	Multi	38.4		reactive	TK	10	reactive	ventouse vaginal	10mins	female	3	5	6	yes (grunting and hyperbilirubinemia)	-	11	healthy
59	539686	21	Multi	39.3	-	reactive	TK	6	reactive	ventouse vaginal	4 hrs	male	3.1	7	8	no	-	4	healthy
60	539644	25	Multi	39	-	variable deccelerations	TK	10	variable deccelerations	vaginal	5mins	male	2.7	7	9	no	-	4	healthy
61	539571	20	Primi	41.3	post datism	reactive	TK	9	prolonged decceleration s	ventouse f/b forceps	25mins	male	3.4	7	8	no	-	6	healthy
62	540741	19	Primi	37	-	early decceleration s	TN	10	early decceleration	vaginal	5mins	female	2.4	7	8	NO	-	4	healthy

Serial Number	In Patient Number	Age (Years)	Parity	Period gestation	Risk factors	Adm. CTG	thick/thin	PV on diagnosis	CTG before shifting	Mode of delivery	time interval	Sex	Weight (Kgs)	Apgar score 1 Minute	Apgar score 5 Minute	NICU	ph	days in hospital	condition at discharge
63	540672	22	Multi	38.1	-	reactive	TK	2	late decceleration	LSCS	30mins	female	2.8	7	8	no	7.3	5	healthy
64	565554	19	Primi	40.2	THROMBOCYTOPENIA with post datism	reactive	TN	9	early decceleration	vaginal	half hr	male	2.7	7	9	no	-	4	healthy
65	540470	23	Multi	39	-	reactive	TN	10	reactive	vaginal	5mins	male	2.5	7	8	no	-	4	healthy
66	540431	22	Primi	42.1	gest htn with post term	reactive	TK	4	late decceleration	vaginal	half hr	female	2.7	6	7	no	7.29	7	healthy
67	540288	20	Primi	38.2	-	reactive	TK	2	prolonged decceleration s	LSCS	intraop	male	2.7	5	7	yes(observation)	7.2	10	healthy
68	540328	20	Primi	38.4		reactive	TK	10	reactive	vaginal	10mins	male	3	8	9	no	-	4	healthy
69	540280	21	Primi	39.3	PIH	reactive	TK	2	late decceleration	LSCS	intraop	male	3.1	7	8	no	7.24	6	healthy
70	572103	27	Multi	38.2	-	reactive	TK	7	reactive	vaginal	2hrs	male	2.3	7	8	no	-	4	healthy
71	539820	22	Primi	39.5	-	reactive	TK	3	late decceleration	LSCS	35mins	female	3.2	7	8	no	7.19	5	healthy
72	550736	20	Primi	38.6		reactive	TK	3	late decceleration	LSCS	16mins	male	3.4	7	8	no	7.2	4	healthy
73	550837	35	Multi	38.5	-	reactive	TN	os closed	variable decceleration s	LSCS	intraop	male	2.7	7	8	no	-	5	healthy
74	551292	22	Multi	40		reactive	TK	10	early decceleration	LSCS	intraop	MALE	3.1	7	8	no	7.1	7	healthy
75	543212	24	Primi	38	-	suspicious	TK	os closed	suspicious trace	LSCS	intraop	male	2.5	2	5	yes(MAS)	6.8	21	AMA
76	552617	19	Primi	38.2	Antepartum eclampsia	reactive	TK	6	reactive	vaginal	40mins	male	2.7	4	8	no	-	6	healthy
77	550776	25	Multi	40.3	Rh neg with post datism	reactive	TN	10	reactive	vaginal	10mins	female	3	7	8	no	-	4	healthy
78	551148	26	Primi	39.1	K/c/o epilepsy	reactive	TK	10	reactive	vaginal	10mins	male	3.8	7	8	no	-	6	healthy
79	572066	21	Multi	37	-	reactive	TK	3	reactive	LSCS	1hr	female	2.3	8	9	yes	-	5	healthy
80	571877	24	Primi	38.2	iugr	reactive	TK	3	reactive	LSCS	40mins	female	2.3	7	8	no	-	5	healthy
81	571896	24	Multi	41.3	prom with post datism	reactive	TK	3	reactive	LSCS	3hrs	male	2.6	6	7	yes(MAS)	7.28	12	healthy
82	571593	20	Multi	41.1	post datism	reactive	TK	2	prolonged decceleration s	LSCS	intraop	male	2.7	7	8	yes(hyperbilirubinemia)	7.3	5	healthy
83	570970	24	Primi	40.4	post datism	reactive	TK	5	late decceleration	LSCS	35 mins	female	2.5	5	6	yes (MAS)	7.24	11	healthy
84	570986	24	Primi	38.4	severe pih	reactive	TK	8	variable decceleration s	ventouse vaginal	10mins	female	3.2	8	9	no	-	5	healthy
85	570988	36	Multi	41.6	assym iugr with oligo with post datism	reactive	TK	3	late decceleration	LSCS	1hr	male	1.1	4	5	yes (MAS +LBW)	6.9	21	AMA
86	570958	25	Primi	37.5	-	reactive	TK	3	late decceleration	LSCS	half hr	MALE	2.1	5	7	yes (MAS)	7.24	10	healthy
87	570597	23	Multi	37.2	iugr	reactive	TK	2	reactive	LSCS	40mins	female	2.3	7	8	yes(hyperbilirubinemia)	-	7	healthy
88	570530	35	Primi	41.4	post datism	reactive	TK	9	reactive	vaginal	20mins	female	2.8	7	8	no	-	7	healthy
89	567457	19	Multi	38	-	reactive	TK	3	prolonged decceleration s	LSCS	35mins	female	2.9	5	6	yes(STAGE 1 HIE)	7.18	16	healthy
90	570548	21	Primi	41.3	post datism	reactive	TK	2	late decceleration	LSCS	intraop	female	3	6	7	yes (grunting)	7.27	6	healthy
91	570201	24	Primi	38.3		reactive	TK	3	late decceleration	LSCS	intraop	female	3.1	7	8	yes(hyperbilirubinemia)	7.32	8	healthy
92	570347	22	Multi	40		reactive	TK	2	spontaneous accelerations	LSCS	20 mins	male	3	7	8	no	-	5	healthy
93	570311	23	Multi	41.3	post datism	reactive	TN	6	reactive	vaginal	50mins	male	3.08	7	8	yes(hyperbilirubinemia)	-	5	healthy
94	569538	24	Primi	38.1	k/c/o epilepsy with iugr	reactive	TN	8	reactive	vaginal	half hr	male	2.7	7	8	yes (observation)	-	5	healthy
95	569374	30	Primi	40.3	post datism	reactive	TK	1	prolonged decceleration s	LSCS	intraop	male	3	7	8	NO	7.21	6	healthy
96	569101	20	Primi	38	excess liquour	reactive	TK	3	reactive	LSCS	intraop	female	2.4	7	8	no	-	5	healthy
97	569621	22	Primi	41.1	post datism	reactive	TN	10	variable decceleration s	vaginal	during delivery	male	2.9	8	9	no	-	5	healthy
98	569977	23	Multi	38.2		reactive	TK	2	variable decceleration s	LSCS	intraop	male	2.1	7	8	no	7.32	5	healthy
99	569807	19	Primi	40		reactive	TK	2	late decceleration	LSCS	intraop	male	3.2	5	6	yes(MAS)	7.16	14	healthy
100	569593	21	Multi	41.4	post datism	reactive	TN	9	late decceleration	vaginal	15mins	female	2.7	6	7	no	-	5	healthy
101	569061	23	Multi	39	macrosomia	reactive	TK	2	variable decceleration s	LSCS	intraop	female	3.4	6	8	yes (MAS)	7.2	14	healthy
102	569095	22	Multi	37.3	polyhydramnios	reactive	TK	3	late decceleration	Multi	intraop	male	3	6	8	yes (observation)	7.2	7	healthy
103	569030	24	Primi	37.4	iugr	reactive	TN	10	late decceleration	ventouse vaginal	5mins	male	2.5	8	9	no	-	3	healthy
104	569133	26	Multi	38.1	excess liquour	reactive	TK	2	prolonged decceleration s	LSCS	intraop	male	2.8	6	7	yes(resp. distress)	7.24	12	healthy
105	569206	20	Primi	41.3	anemia with post datism	reactive	TN	7	late decceleration	LSCS	6 hrs	female	3	5	6	yes(on ventilator f.b oxygen)	7.1	15	healthy
106	569023	20	Primi	39.1		reactive	TK	1	late decceleration	LSCS	intraop	female	3.3	7	8	no	7.3	5	healthy
107	568781	22	Primi	41.2	post datism	reactive	TK	2	late decceleration	LSCS	intraop	male	3	6	8	no	7.3	5	healthy
108	568831	21	Multi	39.3		reactive	TK	2	late decceleration	LSCS	intraop	male	3	7	8	no	7.29	6	healthy
109	568819	25	Primi	40		reactive	TK	2	late decceleration	LSCS	intraop	male	3	7	8	no	7.14	6	healthy
110	568593	24	Multi	39.2	Assum IUGR	reactive	TN	2	variable decceleration s	LSCS	intraop	male	2.8	6	8	no	7.31	5	healthy
111	568634	25	Multi	39.3	-	reactive	TK	2	variable decceleration s	LSCS	1hr	male	2.5	6	8	no	7.34	5	healthy
112	568266	22	Primi	41	polyhydramnios with post datism	reactive	TN	5	reactive	vaginal	4hrs	male	3.5	7	8	no	-	4	healthy
113	568361	23	Primi	41.4	post datism	reactive	TN	10	reactive	vaginal	5mins	female	3	7	9	no	-	5	healthy
114	568900	19	Primi	41.3	assym iugr with anamnis with post datism	reactive	TK	1	late decceleration	LSCS	intraop	male	2.2	6	7	yes(LBW)	-	12	healthy
115	568184	22	Multi	39.4	excess liquour	reactive	TK	5	late decceleration	LSCS	20mins	male	2.9	7	8	no	7.21	5	healthy
116	568147	36	Multi	42.1	prom with post term	reactive	TN	3	suspicious trace	LSCS	half hr	male	2.1	7	8	no	7.3	4	healthy
117	567768	22	Primi	40		reactive	TK	10	late decceleration	ventouse vaginal	5mins	female	2.5	6	8	no	-	4	healthy
118	567702	24	Primi	39.3		reactive	TN	10	reactive	vaginal	10mins	male	2.9	6	8	no	-	5	healthy
119	567936	20	Multi	41.1	post datism	reactive	TK	1	prolonged decceleration s	LSCS	intraop	male	3.5	7	8	NO	7.34	6	healthy
120	578787	20	Primi	39.2	Rh neg	reactive	TN	10	reactive	vaginal	15mins	female	2.5	7	8	No	no	5	healthy
121	567717	24	Primi	37	iugr with absent diastolic flow	reactive	TK	1	late decceleration	LSCS	intraop	male	1.4	5	6	YES(birth asphyxia)	7.2	21	healthy
122	567645	31	Primi	39.3	precious pregnancy	reactive	TK	2	late decceleration	LSCS	intraop	male	2.3	5	9	no	7.27	5	healthy
123	567356	23	Primi	40		reactive	TN	9	reactive	ventouse vaginal	15mins	male	2.5	7	8	no	7.3	4	healthy
124	566791	23	Primi	39.3		reactive	TN	10	reactive	vaginal	15mins	female	2.6	7	8	no	-	5	healthy

Serial Number	In Patient Number	Age (Years)	Parity	Period gestation	Risk factors	Adm. CTG	thick/thin	PV on diagnosis	CTG before shifting	Mode of delivery	time interval	Sex	Weight (Kgs)	Apgar score 1 Minute	Apgar score 5 Minute	NICU	ph	days in hospital	condition at discharge
125	566920	29	Primi	40.4	pih with post datism	reactive	TN	2	reactive	LSCS(NPL)	4hrs	male	3.1	8	9	no	-	4	healthy
126	565863	22	Primi	42.3	severe pih with post term	reactive	TK	2	prolonged decceterations	LSCS	intraop	male	2.4	6	9	no	-	10	healthy
127	566518	28	Multi	39		reactive	TK	6	late decceleration	LSCS	3hrs	male	2.3	6	9	no-	7.2	6	healthy
128	566240	26	Multi	41.2	bad obstetric history with post datism	reactive	TK	2	prolonged decceterations	LSCS	intraop	male	2.8	7	9	no	7.29	5	healthy
129	566106	23	Primi	39.5	-	reactive	TK	4	suspicious trace	LSCS	25mins	male	3.1	7	8	no	7.24	5	healthy
130	565624	20	Primi	40.1	post datism	reactive	TN	9	reactive	vaginal	half hr	female	2.8	8	9	no	Multi	6	healthy
131	565439	29	Multi	41.1	Anemia with post datism	reactive	TK	1	variable decceterations	LSCS	intraop	female	3.4	6	7	no	-	5	healthy
132	565144	21	Multi	39		reactive	TK	10	reactive	vaginal	10mins	male	3.6	7	9	no	-	5	healthy
133	564583	25	Multi	38.2	severe pih	reactive	TK	1	reactive	LSCS	1hr	female	2.6	7	8	no	-	5	healthy
134	564237	21	Multi	39.2		reactive	TK	3	reactive	LSCS	intraop	male	3.4	7	9	no	7.2	5	healthy
135	564142	23	Primi	38.3	-	reactive	TK	2	reactive	LSCS	intraop	female	2.3	7	8	No	7.14	5	healthy
136	563723	24	Primi	39	Anemia	reactive	TK	5	prolonged decceterations	LSCS	half hr	male	3	7	8	no	7.3	7	healthy
137	563856	26	Multi	38.1	EROM	reactive	TK	2	late decceleration	LSCS	intraop	male	3.1	5	8	no	7.29	8	healthy
138	563595	19	Primi	39.2	-	reactive	TN	9	reactive	vaginal	50mins	male	3.2	6	9	no	-	4	healthy
139	563580	23	Primi	40		reactive	TN	3	late decceleration	LSCS	intraop	male	2.7	5	8	no	-	5	healthy
140	563576	21	Primi	42.3	post term	reactive	TK	4	late decceleration	LSCS	1hr45mins	male	2.6	6	7	yes(observation)	7.12	8	healthy
141	563501	23	Multi	41.1	post datism	reactive	TN	10	reactive	vaginal	during delivery	male	3.2	7	9	no	-	4	healthy
142	502821	19	Primi	42.1	post term	reactive	TK	5	prolonged decceterations	LSCS	45mins	male	2.3	5	8	no	7.2	6	healthy
143	562801	22	Primi	37	iugr	reactive	TK	2	late decceleration	LSCS	intraop	female	2	7	8	no	7.23	6	healthy
144	562715	22	Multi	39.2		reactive	TN	7	reactive	vaginal forceps	1 hr	female	3.5	5	8	no	-	5	healthy
145	562122	25	Multi	41.3	post datism	reactive	TK	3	late decceleration	Multi	half hr	female	3.6	5	8	yes(observation)	7.14	6	healthy
146	561908	26	Primi	38.5	-	reactive	TK	3	late decceleration	LSCS	25mins	male	2.4	5	8	no	7.21	5	healthy
147	561630	20	Primi	37.2	-	reactive	TK	2	late decceleration	LSCS	intraop	male	3.1	6	9	NO	7.19	6	healthy
148	559859	29	Multi	37.4	gest htn	reactive	TK	3	reactive	LSCS	1hr	male	2.6	6	9	no	-	7	healthy
149	561301	22	Primi	37.6	IUGR with severe oligo	reactive	TK	4	prolonged decceterations	LSCS	45mins	female	1.3	6	7	yes(LBW with MAS)	7.2	21	AMA
150	561237	21	Primi	38	assym iugr with oligo	reactive	TN	2	non reactive	LSCS	intraop	female	2.4	7	9	no	7.3	5	healthy
151	561191	19	Primi	41.6	Antepartum eclampsia with post datism	reactive	TN	9	prolonged decceterations	vaginal ventouse	5mins	male	2.5	7	8	NO	-	4	healthy
152	562370	25	Primi	41.2	post datism	reactive	TN	2	reactive	LSCS(NPL)	intraop	male	3	6	9	no	-	8	healthy
153	561172	20	Multi	39.3	severe PIH	reactive	TN	1	late decceleration	LSCS	intraop	female	2.3	6	9	NO	-	6	healthy
154	561042	22	Primi	41.2	post datism	reactive	TK	2	late decceleration	LSCS	intraop	male	2	6	9	no	-	5	healthy
155	559590	23	Multi	39.3	-	reactive	TK	6	prolonged decceterations	LSCS	intraop	male	2.7	6	9	no	7.28	12	healthy
156	559600	39w	Multi	39.2	Rh neg	reactive	TN	8	reactive	vaginal ventouse	40 mins	female	3	7	9	no	-	5	healthy
157	560272	22	Primi	41.3	post datism	reactive	TK	2	reactive	LSCS(NPL)	intraop	female	3.6	7	9	no	-	5	healthy
158	556489	23	Primi	38.4	-	reactive	TN	3	reactive	LSCS(NPL)	intraop	male	3.4	7	8	NO	-	4	healthy
159	558399	28	Multi	41	post datism	reactive	TN	10	reactive	vaginal	5mins	male	3.7	5	9	no	-	4	healthy
160	516102	23	Primi	39.1	gest htn	reactive	TK	4	prolonged decceterations	LSCS	40mins	male	3.2	7	8	no	7.24	6	healthy
161	558099	26	Multi	39.1	k/c/o epilepsy	reactive	TN	8	reactive	vaginal	1hr	male	2.26	7	8	no	-	4	healthy
162	558419	24	Multi	39	-	reactive	TK	9	reactive	vaginal	15mins	female	3.7	7	8	no	-	4	healthy
163	556073	23	Primi	37	microcephaly	reactive	TK	2	prolonged decceterations	LSCS	intraop	female	1.9	6	9	yes(observation)	7.3	5	healthy
164	586045	23	Multi	38.5	-	reactive	TK	1	variable decceterations	LSCS	intraop	female	2.7	6	7	no	7.34	5	healthy
165	585874	29	Primi	39.2	-	reactive	TK	3	late decceleration	LSCS	intraop	female	2.3	7	8	no	7.28	6	healthy
166	585540	25	Multi	38.1	PIH	reactive	TN	10	reactive	vaginal	half hr	female	2.8	5	7	no	-	5	healthy
167	564841	27	Multi	39.2	-	reactive	TN	8	reactive	vaginal	half hr	male	3.5	7	9	no	-	3	healthy
168	585462	23	Multi	40.2	Assym IUGR with post datism	reactive	TK	1	reactive	LSCS	1hr	female	2.3	7	8	no	7.3	7	healthy
169	585460	21	Primi	39.3		reactive	TK	8	reactive	vaginal	2hrs	female	2.6	7	8	no	-	3	healthy
170	585889	25	Multi	37.1	-	reactive	TK	6	reactive	vaginal	1hr	male	2.6	7	8	no	-	4	healthy
171	585284	23	Primi	39.4		reactive	TK	1	reactive	LSCS	intraop	female	2.6	7	8	no	-	5	healthy
172	568416	22	Primi	40		reactive	TK	1	late decceleration	LSCS	intraop	male	3.2	6	8	no	7.34	5	healthy
173	585119	23	Primi	37.1	Assym IUGR	reactive	TK	3	prolonged decceterations	LSCS	intraop	female	2.4	7	9	no	7.3	5	healthy
174	584866	22	Primi	37.4	PIH	reactive	TN	4	late decceleration	LSCS	1hr	male	2.3	7	8	no	7.3	7	healthy
175	545112	24	Multi	39	-	reactive	TK	3	non reactive	LSCS	50mins	MALE	3.1	6	7	no	7.24	6	healthy
176	545115	35	Multi	40.4	post datism	reactive	TN	9	reactive	vaginal	10mins	female	2.2	7	8	no	-	5	healthy
177	544753	25	Multi	41.3	post datism	reactive	TK	2	late decceleration	LSCS	1HR	male	3.2	8	9	no	7.32	6	healthy
178	545505	20	Primi	39.1		reactive	TN	10	reactive	vaginal	5mins	male	3.2	7	8	no-	-	4	healthy
179	545308	28	Primi	41.2	post datism	reactive	TN	6	reactive	vaginal	2h	female	3.8	8	9	no	-	5	healthy
180	545510	23	Primi	40		reactive	TK	3	late decceleration	LSCS	40mins	female	2.6	7	8	no	-	4	healthy
181	545600	21	Primi	40.3	post datism	reactive	TK	2	prolonged decceterations	LSCS	25mins	female	2.4	7	8	no	7.33	7	healthy
182	544579	26	Primi	41.3	post datism	reactive	TN	7	early decceleration	ventouse vaginal	2hrs	female	2.6	8	9	no	-	5	healthy
183	543734	22	Primi	39.2		reactive	TN	10	reactive	vaginal	during delivery	male	3.2	7	9	no	-	4	healthy
184	545840	24	Multi	41	post datism	reactive	TN	9	reactive	vaginal	half hr	male	4.1	7	8	no	-	5	healthy
185	545859	25	Primi	41.3	post datism	reactive	TN	2	reactive	LSCS(failed induction)	2hrs	female	3.3	6	7	no	-	6	healthy
186	546417	20	Primi	39.3		reactive	TN	10	early decceleration	vaginal	10mins	male	2.2	5	6	yes(observation)	-	5	healthy

Serial Number	In Patient Number	Age (Years)	Parity	Period gestation	Risk factors	Adm. CTG	thick/thin	PV on diagnosis	CTG before shifting	Mode of delivery	time interval	Sex	Weight (Kgs)	Apgar score 1 Minute	Apgar score 5 Minute	NICU	ph	days in hospital	condition at discharge
187	546983	25	Multi	40.4	post datism	reactive	TK	2	prolonged decceleration s	LSCS	half hr	MALE	2.8	7	8	no	7.21	6	healthy
188	574072	28	Multi	38	anemia	reactive	TK	1	late decceleration	LSCS	half hr	male	2	7	8	yes(on ventilator f.b oxygen)	7.12	5	healthy
189	547143	21	Primi	42.1	post term	reactive	TN	10	reactive	vaginal	10mins	female	3.2	7	8	no	-	4	healthy
190	546908	24	Primi	39	-	reactive	TN	10	reactive	vaginal	half hr	male	2.7	7	8	no	-	5	healthy
191	547131	28	Primi	41.5	post datism	reactive	TN	9	early decceleration	ventouse vaginal	10mins	female	2.7	6	7	no	-	5	healthy
192	546947	24	Primi	38	-	reactive	TK	2	prolonged decceleration s	LSCS	20mins	female	2.8	7	8	yes(on oxygen)	7.2	5	healthy
193	547009	22	Multi	39.1	-	reactive	TN	6	reactive	vaginal	2hrs	male	2.4	7	8	no	-	4	healthy
194	546790	20	Primi	39.3	-	reactive	TN	10	reactive	vaginal	during delivery	female	2.5			no	-	3	healthy
195	543011	28	Multi	37.3	severe preeclampsiaepilepsy with assym iugr	reactive	TK	admitting tip	late decceleration	LSCS	intraop	female	1.5	5	6	yes(oxygen and LBW)	7.24	12	healthy
196	546585	22	Primi	39	-	reactive	TN	8	non reactive	LSCS	half hr	female	2.7	6	7	no	7.28	4	healthy
197	546508	22	Primi	40.3	post datism	reactive	TK	2	prolonged decceleration s	LSCS	15mins	male	2.7	6	7	yes(observation)	7,19	5	healthy
198	546511	20	Primi	38	-	reactive	TK	3	late decceleration	LSCS	25mins	male	3.2	6	7	no	7.24	5	healthy
199	546526	24	Multi	39.1		reactive	TN	6	reactive	vaginal	55mins	male	3.7	7	8	no	-	5	healthy
200	546670	26	Multi	39.2	-	reactive	TK	10	reactive	vaginal	during delivery	female	3.3	7	8	no	-	5	healthy
201	546581	24	Multi	41.3	gest htn with post datism	reactive	TN	8	reactive	vaginal	half hr	female	2.6	7	8	no	-	4	healthy
202	548034	21	Multi	38	IUGR	reactive	TK	1	late decceleration	Multi	half hr	female	2.2	5	6	yes(observation)	7.23	5	healthy
203	547656	24	Multi	39	-	reactive	TN	10	reactive	vaginal	1hr	male	2.6	6	7	no	-	4	healthy
204	546474	21	Primi	39.3	oligoamnios	reactive	TN	2	reactive	LSCS(failed induction)	intraop	male	2.8	7	8	NO	-	5	healthy
205	547725	25	Multi	42.2	post term	reactive	TN	9	reactive	vaginal	10mins	female	2.3	7	8	no	-	4	healthy
206	547353	23	Primi	37.4	pih	reactive	TK	2	reactive	LSCS(NPL)	intraop	female	3.2	7	9	no	-	5	healthy
207	547516	20	Primi	41	post datism	reactive	TN	10	prolonged decceleration s	ventous vagina	15mins	female	2.6	5	8	yes(observation)	-	5	healthy
208	547384	23	Primi	39.4		reactive	TN	10	reactive	vaginal	20mins	female	2.6	7	8	no	-	3	healthy
209	546841	20	Primi	38	-	reactive	TN	8	reactive	vaginal	25mins	male	2.6	7	8	no	-	4	healthy
210	547235	24	Primi	41.3	pih with post datism	reactive	TN	9	reactive	vaginal	20mins	male	3	5	6	yes(observation)	-	5	healthy
211	547195	26	Multi	38.2	assym iugr with oligo	reactive	TK	10	non reactive	ventouse vaginal	10mins	male	2.3	5	6	yes(observation)	-	5	healthy
212	572519	30	Multi	38.1	Assym IUGR	reactive	TK	1	pathological trace	LSCS	20mins	male	1.6	5	6	yes(STAGE 1 HIE)	7.2	15	healthy
213	571729	28	Primi	37	hypothyroidism	reactive	TK	2	late decceleration	LSCS	half hr	male	2.2	7	9	yes(observation)	7.24	6	healthy
214	572272	20	Multi	41.2	post datism	reactive	TN	9	reactive	ventouse vaginal	Multi	male	3.1	8	9	no	-	5	healthy
215	572108	21	Primi	41.3	post datism	reactive	TK	3	reactive	LSCS(NPL)	40mins	male	3.3	8	9	no	-	7	healthy
216	572160	20	Primi	39.6	-	reactive	TK	1	reactive	LSCS(MSL)	45mins	male	2.3	8	9	no	-	7	healthy
217	572101	30	Multi	42.3	post term	reactive	TN	10	prolonged decceleration s	ventouse vaginal	5mins	female	3.8	5	9	yes(observation)	-	5	healthy
218	571537	26	Primi	40	epilepsy	reactive	TK	1	prolonged decceleration s	LSCS	20mins	male	2.5	7	8	no	7.27	5	healthy
219	543431	25	Multi	38	oligoamnios	reactive	TK	3	reactive	LSCS(MSL)	1hr	male	3	7	8	no	-	4	healthy
220	548181	22	Multi	40		reactive	TN	6	reactive	vaginal	4hrs	male	2.6	7	8	no	-	4	healthy
221	574169	20	Primi	39.3		variable decceleration s	TK	os closed	variable decceleration s	LSCS	intraop	male	2.4	8	9	yes	7.24	8	healthy
222	574073	25	Primi	42.3	post term	reactive	TN	2	late decceleration	LSCS	1hr	female	2.2	8	9	yes(MAS)	7.12	12	healthy
223	573654	24	Multi	38.6	-	reactive	TN	10	reactive	vaginal	half hr	female	2.5	7	9	no	-	4	healthy
224	573611	28	Multi	39	iugr	reactive	TN	9	reactive	vaginal	45mins	male	2.8	8	9	no	-	4	healthy
225	572109	28	Multi	39.3		reactive	TN	8	reactive	vaginal	1hr	male	2.9	7	8	yes(observation)	-	5	healthy
226	573503	21	Primi	41.4	post datism	reactive	TN	10	prolonged decceleration s	ventouse vaginal	15mins	male	3	7	8	no	-	4	healthy
227	573400	29	Primi	39.3	-	reactive	TN	5	variable decceleration s	LSCS	1hr	male	2.8	7	8	yes(observation)	-	5	healthy
228	573019	23	Primi	38	-	reactive	TK	7	late decceleration	LSCS	half hr	female	3.2	7	8	NO	7.3	5	healthy
229	573014	24	Primi	37.2	Assym IUGR	reactive	TK	5	variable decceleration s	LSCS	20mins	male	1.6	6	7	yes(MAS)	7.2	10	healthy
230	589177	22	Primi	41.4	post datism	reactive	TK	4	late decceleration	LSCS	35mins	male	3	7	8	no	7.24	5	healthy
231	589081	28	Multi	39	oligoamnios with IUGR	reactive	TN	8	reactive	vaginal	30mins	female	2.9	7	8	no	-	5	healthy
232	588914	20	Primi	39.1		reactive	TK	5	reactive	LSCS	20mins	female	2.7	7	8	no	7.24	5	healthy
233	588883	27	Multi	38	PIH with IUGR	reactive	TN	10	early decceleration	vaginal	during delivery	female	1.8	6	8	yes(observation)	-	10	healthy
234	588726	24	Multi	40.2	PIH with post datism	reactive	TK	5	late decceleration	LSCS	30mins	female	2.7	6	7	yes (observation)	7.16	5	healthy
235	588728	30	Multi	40	-	reactive	TN	9	reactive	vaginal	15mins	female	2.9	7	9	no	-	5	healthy
236	588700	19	Primi	37.5	PROM	reactive	TN	5	late decceleration	LSCS	40mins	male	2.4	7	9	no	7.26	5	healthy
237	588698	19	Primi	38.2	Rh neg	reactive	TN	8	reactive	vaginal	45mins	female	3.3	7	9	no	-	4	healthy
238	588457	21	Primi	38.4	PIH	reactive	TN	7	reactive	vaginal	2hrs	female	2.6	6	8	no	-	4	healthy
239	588432	21	Multi	40		reactive	TK	1	variable decceleration s	LSCS	intra-op	female	3.1	7	8	no	-	5	healthy
240	568485	24	Primi	37	-	reactive	TK	2	late decceleration	LSCS	30mins	male	2.7	7	8	no	7.33	5	healthy
241	588403	24	Primi	40.6	anemia with post datism	reactive	TN	5	late decceleration	LSCS	40mins	female	2.5	6	8	no	7.22	7	healthy
242	588472	21	Primi	40.5	post datism	reactive	TK	2	prolonged decceleration s	LSCS	25mins	male	3.8	7	8	Yes(resp grunting)	7.19	8	healthy
243	588253	24	Multi	41	post datism	reactive	TN	10	early decceleration	vaginal	5mins	female	3.3	7	9	no	-	5	healthy
244	588028	30	Multi	39	-	reactive	TN	3	late decceleration	LSCS	45mins	female	2.9	6	8	no	7.29	6	healthy
245	588174	24	Primi	40	EROM	reactive	TK	2	late decceleration	LSCS	6hours	female	3.5	7	8	no	7.24	5	healthy
246	587106	23	Primi	41.3	post datism	reactive	TK	2	late decceleration	LSCS	intraop	female	2.2	7	8	no	-	6	healthy
247	584583	24	Multi	37.6	gest htn	reactive	TK	10	reactive	vaginal	5mins	female	2.3	7	8	no	-	4	healthy
248	588028	30	Multi	39	-	reactive	TK	3	late decceleration	LSCS	2hrs	female	2.9	7	8	no	7.2	5	healthy

Serial Number	In Patient Number	Age (Years)	Parity	Period gestation	Risk factors	Adm. CTG	thick/thin	PV on diagnosis	CTG before shifting	Mode of delivery	time interval	Sex	Weight (Kgs)	Apgar score 1 Minute	Apgar score 5 Minute	NICU	ph	days in hospital	condition at discharge
249	587401	20	Primi	39.3	-	reactive	TK	2	late decceleration	LSCS	Intraop	female	2.5	7	8	no	7.3	5	healthy
250	564109	22	Primi	39.4	IUGR	reactive	TK	3	late decceleration	LSCS	Intraop	male	2.3	7	8	no	7.24	5	healthy
251	587229	28	Primi	39.3	-	reactive	TK	10	prolonged decceleration s	vaginal	10mins	female	2.6	7	8	no	-	4	healthy
252	586909	24	Multi	37.3	macrosomia	reactive	TK	3	late decceleration	LSCS	Intraop	female	2.8	7	8	yes(observation)	7.28	5	healthy
253	586718	20	Primi	39	-	reactive	TK	2	late decceleration	LSCS	Intraop	female	2.9	7	8	no	7.24	5	healthy
254	543212	23	Multi	40.2	post datism	reactive	TN	10	early decceleration	vaginal	5mins	female	2.6	8	9	no	-	5	healthy
255	586369	24	Primi	40.1	PIH with PROM with post datism	reactive	TN	3	variable decceleration s	LSCS	Intraop	male	2.6	5	7	no	7.3	5	healthy
256	586423	27	Multi	38	macrosomia	reactive	TK	2	prolonged decceleration s	LSCS	Intraop	male	4	6	7	no	7.2	5	healthy
257	586428	32	Primi	39.3	severe PIH	reactive	TK	1	non reactive	LSCS	Intraop	female	2.8	5	7	no	7.3	7	healthy
258	586120	26	Multi	39.4	PROM	reactive	TN	2	late decceleration	LSCS	50mins	female	3.2	5	7	no	-	5	healthy
259	520935	23	Primi	37	PIH	reactive	TN	3	late decceleration	LSCS	35mins	female	3.1	7	8	no	-	5	healthy
260	520965	20	Primi	41.3	post datism	reactive	TK	10	late decceleration	ventouse assisted	10mins	male	3.2	7	8	no	-	5	healthy
261	520971	24	Primi	39	Assym IUGR	reactive	TN	10	early decceleration	vaginal	20mins	female	2.5	7	8	no	-	4	healthy
262	520944	20	Primi	38.1	Antepartum eclampsia	reactive	TK	1	persistent variable decceleration s	LSCS	35mins	male	2	5	8	yes(kmc)	-	8	healthy
263	522533	20	Primi	40	PROM	category 2	TK	1	category 2	LSCS	1hr	male	3.2	6	7	yes(observation)	-	5	healthy
264	544676	21	Multi	40	PIH	reactive	TN	10	early decceleration	ventouse assisted	15mins	female	2.3	7	8	no	-	5	healthy
265	522252	20	Primi	38.2	-	reactive	TN	9	reactive	ventouse assisted	40 mins	female	2.3	7	8	no	-	5	healthy
266	543234	30	Primi	40	precious pregnancy	reactive	TK	1	reactive	LSCS	1hr	female	3.7	7	9	no	-	5	healthy
267	522031	22	Primi	40.5	post datism	reactive	TK	2	reactive	LSCS	1hr	male	3.8	7	8	no	-	5	healthy
268	521957	20	Primi	40.3	Rh neg with post datism	reactive	TK	9	late decceleration	ventouse f/b forceps	10mins	female	3	7	9	no	-	6	healthy
269	521844	22	Primi	40.2	oligohydramnios with post datism	reactive	TK	8	late decceleration	ventouse	10mins	female	3.6	6	7	yes(observation)	-	4	healthy
270	522057	21	Primi	37.6	severe PIH	reactive	TK	1	reactive	LSCS	Intraop	female	3	7	8	no	-	5	healthy
271	521786	20	Multi	39	EROM	reactive	TN	1	persistent variable decceleration s	LSCS	40mins	female	2.9	7	9	no	-	5	healthy
272	521852	26	Multi	37.6	-	reactive	TN	9	reactive	vaginal	15mins	female	3	7	8	no	-	5	healthy
273	521420	25	Multi	40	oligohydramnios	reactive	TK	4	late decceleration	LSCS	half hr	male	2.5	7	8	no	-	6	healthy
274	521408	21	Primi	40		reactive	TK	5	late decceleration	LSCS	half hr	male	2.7	6	7	no	-	5	healthy
275	521481	20	Primi	39	-	reactive	TN	10	reactive	vaginal	half hr	male	3.2	7	9	no	-	5	healthy
276	521542	22	Primi	39.1	PIH	reactive	TN	7	reactive	vaginal	3hrs	female	3.2	7	8	no	-	4	healthy
277	521428	22	Primi	40	Assym IUGR	reactive	TK	3	variable decceleration s	LSCS	half hr	female	2.5	7	8	no	-	5	healthy
278	521503	24	Primi	40.4	severe oligohydramnios with post datism	reactive	TK	2	late decceleration	LSCS	Intraop	male	2.3	7	8	no	-	5	healthy
279	521456	20	Primi	38.3	K/C/O RHD with Mod MS	reactive	TN	10	reactive	ventouse assisted	10mins	male	2.8	7	8	no	-	4	healthy
280	521207	29	Primi	41.3	post datism	reactive	TK	1	late decceleration	LSCS	25mins	female	2.5	6	7	no	-	5	healthy
281	519115	25	Primi	39.3	PIH	reactive	TN	1	reactive	LSCS	1hr	female	2.5	7	8	no	-	5	healthy
282	521334	24	Primi	37	IUGR	reactive	TN	2	variable decceleration s	LSCS	40mins	male	1.8	7	8	no	-	6	healthy
283	527057	29	Primi	40	PIH	reactive	TN	1.5	reactive	LSCS	1hr	male	2.8	6	7	no	-	5	healthy
284	526615	26	Multi	39.6	-	reactive	TK	5	late decceleration	LSCS	45mins	female	2.5	7	8	no	-	6	healthy
285	525400	20	Primi	40.5	post datism	reactive	TN	6	reactive	vaginal	1hr20mins	male	3	7	9	no	-	7	healthy
286	525797	25	Primi	40.2	post datism	reactive	TN	4	late decceleration	LSCS	half hr	female	3.1	7	8	no	-	6	healthy
287	525735	23	Primi	39	Rh neg	reactive	TN	3	variable decceleration s	LSCS	40mins	female	2.8	7	8	yes(observation)	-	5	healthy
288	524886	18	Primi	40		reactive	TK	10	late decceleration	ventouse f/b LSCS	20mins	MALE	3	4	6	yes(resp. distress)	-	8	healthy
289	548909	28	Multi	39	excess liquour	reactive	TN	9	reactive	vaginal	20mins	male	2.4	7	8	no	-	5	healthy
290	525028	29	Primi	40.1	post datism	reactive	TK	3	reactive	LSCS	45mins	female	3	7	8	no	-	5	healthy
291	524675	21	Multi	40.4	post datism	reactive	TK	2	reactive	LSCS	40mins	female	2.9	6	8	no	-	7	healthy
292	524411	28	Primi	38.2	right dermoid cyst	reactive	TK	3	late decceleration	LSCS	half hr	female	2.45	7	8	yes(observation)	-	7	healthy
293	524041	24	Multi	38.4	Active TB	reactive	TN	7	late decceleration	LSCS	20mins	male	2.5	5	7	yes(grunting)	-	6	healthy
294	524175	22	Multi	41.3	post datism	reactive	TK	1	prolonged decceleration s	LSCS	Intraop	female	3.4	7	8	no	7.2	5	healthy
295	523998	22	Multi	38	-	reactive	TN	10	early decceleration	Vaginal	20mins	male	3.2	7	8	no	-	5	healthy
296	523769	31	Primi	40		reactive	TN	10	early decceleration	ventouse assisted	5mins	female	2.6	7	8	no	-	6	healthy
297	522530	21	Primi	39	polyhydramnios	reactive	TN	9	reactive	vaginal	20mins	male	3.1	7	8	no	-	4	healthy
298	521544	27	Primi	38.5	-	reactive	TK	2	prolonged decceleration s	LSCS	Intraop	male	2.8	7	8	yes(observation)	-	9	healthy
299	523014	23	Primi	39	-	reactive	TK	1	late decceleration	LSCS	Intraop	male	2.9	7	8	no	-	5	healthy
300	522923	25	Multi	40.5	post datism	reactive	TN	10	early decceleration	vaginal	10mins	male	2.1	7	8	no	-	4	healthy
301	522734	18	Multi	40		reactive	TN	1	persistent variable decceleration s	LSCS	intraop	female	2.4	7	8	no	-	8	healthy
302	512077	23	Multi	39	-	reactive	TN	5	late decceleration	LSCS	half hr	female	2.2	5	6	yes(resp. distress)	-	8	healthy
303	530022	27	Multi	39.2	hypothyroidism	reactive	TN	10	reactive	vaginal	15mins	female	3.6	6	8	no	-	5	healthy
304	529744	22	Multi	39.1	precious pregnancy	reactive	TK	1	reactive	LSCS(TMSL)	1hr	female	2.5	7	8	no	-	8	healthy
305	529710	27	Multi	40.4	post datism	reactive	TN	8	reactive	vaginal	20mins	male	3.7	7	8	no	-	5	healthy
306	529625	20	Primi	39	-	reactive	TN	10	reactive	vaginal	during delivery	female	2.3	7	8	no	-	4	healthy
307	528755	21	Primi	37.3	-	reactive	TK	10	variable decceleration s	forceps	half hr	female	2.7	7	8	no	-	7	healthy
308	528975	20	Primi	39	-	reactive	TN	2	late decceleration	LSCS	half hr	female	3.5	7	8	no	-	5	healthy
309	528975	24	Multi	37.5	-	reactive	TN	9	reactive	vaginal	35mins	male	2.6	7	8	no	-	5	healthy
310	528696	18	Primi	39.3	PIH	reactive	TN	10	early decceleration	ventouse assisted	15mins	male	2.5	6	7	no	-	6	healthy

Serial Number	In Patient Number	Age (Years)	Parity	Period gestation	Risk factors	Adm. CTG	thick/thin	PV on diagnosis	CTG before shifting	Mode of delivery	time interval	Sex	Weight (Kgs)	Apgar score 1 Minute	Apgar score 5 Minute	NICU	ph	days in hospital	condition at discharge
311	528242	20	Primi	40.3	k/c/o pda with post datism	reactive	TK	1	reactive	LSCS(NPL)	1HR	male	3.2	7	8	no	-	7	healthy
312	528136	21	Primi	40.4	post datism	reactive	TK	1	late decceleration	LSCS	Intraop	male	3.5	7	8	NO	-	15	healthy
313	528226	20	Multi	38.4	-	reactive	TN	10	reactive	Vaginal	5mins	female	3	7	8	no	-	6	healthy
314	528207	24	Primi	39	Rh neg	reactive	TK	1	reactive	LSCS(TMSL)	1hr	male	2.7	7	8	no	-	5	healthy
315	529120	33	Multi	38.2	severe PIH	reactive	TK	1	reactive	LSCS(NPL)	Intraop	female	4	7	8	no	-	5	healthy
316	527676	26	Primi	39.3	-	reactive	TK	1	reactive	LSCS(TMSL)	1hr	female	3	7	9	no	-	10	healthy
317	527926	19	Primi	39.3	-	reactive	TK	9	reactive	vaginal	half hr	male	2.9	6	7	yes(observation)	-	7	healthy
318	527661	20	Primi	41.3	post datism	reactive	TK	3	prolonged decceleration s	LSCS	25mins	female	2.4	7	9	no	-	8	healthy
319	527497	24	Primi	39.6	-	reactive	TN	10	reactive	vaginal	15mins	male	3.2	7	8	no	-	6	healthy
320	527193	28	Multi	39	-	reactive	TN	2	reactive	LSCS(failed induction)	40mins	female	3.2	7	8	NO	-	5	healthy
321	527147	25	Multi	41.2	post datism	reactive	TN	8	reactive	vaginal	half hr	female	2.7	6	7	no	-	4	healthy
322	527080	25	Primi	39.2	-	reactive	TK	6	late decceleration	LSCS	half hr	male	2.7	7	8	no	-	5	healthy
323	527103	30	Primi	39	PIH	reactive	TK	3	reactive	LSCS(TMSL)	45mins	female	2.9	7	8	yes(observation)	-	5	healthy
324	520684	21	Primi	41.3	post datism	reactive	TN	8	reactive	vaginal	1hr	female	2.8	7	9	no	-	7	healthy
325	521066	22	Primi	40.6	post datism	reactive	TN	10	reactive	vaginal	during delivery	male	2.5	7	8	NO	-	4	healthy
326	521154	23	Primi	38.4	-	reactive	TK	9	reactive	vaginal	during delivery	male	3.5	6	8	no	-	4	healthy
327	521925	23	Primi	37.1	polyhydramnios	reactive	TN	6	reactive	vaginal	2 and half	female	3.2	7	8	no	-	5	healthy
328	522244	23	Primi	38.5	Gestation diabetes mellitus	reactive	TN	10	reactive	vaginal	during delivery	female	3.5	7	9	no	-	6	healthy
329	522261	24	Multi	40		reactive	TK	3	reactive	LSCS(NPL)	1HR	male	2.8	6	9	NO	-	8	healthy
330	522371	19	Primi	39.3	teenage pregnancy	reactive	TN	9	reactive	vaginal	half hr	male	3.1	6	9	bag and mask ventilation done	-	5	healthy
331	522617	30	Multi	40.1	anemia with post datism	reactive	TK	2	reactive	LSCS(anamnios with anemia)	1hr	male	2.3	7	8	no	-	5	healthy
332	520399	19	Primi	39.4	-	reactive	TN	10	reactive	vaginal	during delivery	female	2.4	7	8	no	-	5	healthy
333	524764	18	Primi	37	IUGR	reactive	TN	8	reactive	vaginal	1hr	male	2.5	7	8	no	-	7	healthy
334	524800	32	Primi	39.3	Prom	reactive	TN	10	reactive	LSCS(Second stage arrest)	intraop	male	2.6	7	8	no	-	9	healthy
335	525401	19	Primi	37.4	severe pih	reactive	TN	8	reactive	vaginal	half hr	female	2.1	7	8	no	-	7	healthy
336	528114	24	Multi	39.5	-	reactive	TN	10	reactive	vaginal	during delivery	male	3.4	7	8	no	-	3	healthy
337	528095	26	Primi	39.2	EROM	reactive	TN	2	reactive	LSCS(NPL)	intraop	female	3	7	9	no	-	6	healthy
338	529802	25	Primi	39	-	reactive	TN	7	reactive	vaginal	during delivery	male	3.2	7	8	no	-	5	healthy
339	528436	23	Primi	37.2	Mild MS with anemia	reactive	TN	6	reactive	vaginal	2hrs	female	2.9	7	8	no	-	6	healthy
340	521456	20	Primi	38.6	-	reactive	TN	7	reactive	vagin	1hr	male	2.8	7	8	no	-	7	healthy