"STUDY OF RELATIONSHIP BETWEEN BLOOD GROUPS AND THROAT CULTURE SENSITIVITY FINDINGS IN PATIENTS WITH CHRONIC TONSILLITIS, A ONE YEAR CROSS SECTIONAL STUDY IN A TERTIARY CARE CENTRE"

By

REGISTRATION NO: BE0121001

Dissertation

Submitted to the KLE Academy of Higher Education and Research, Belagavi, Karnataka

In Partial Fulfilment

of the Requirements for the Degree of

M.S

IN

OTORHINOLARYNGOLOGY

AND HEAD AND NECK SURGERY

DEPARTMENT OF OTORHINOLARYNGOLOGY AND HEAD AND NECK SURGERY,
JAWAHARLAL NEHRU MEDICAL COLLEGE,
BELAGAVI, KARNATAKA

DECEMBER-2024 / JANUARY -2025

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCHBELAGAVI, KARNATAKA

ENDORSEMENT BY THE HOD, PRINCIPAL/ HEAD OF THE INSTITUTION

This is to certify that the dissertation entitled **"STUDY OF RELATIONSHIP BETWEEN BLOOD GROUPS AND THROAT CULTURE SENSITIVITY FINDINGS IN PATIENTS WITH CHRONIC TONSILLITIS, A ONE YEAR CROSS SECTIONAL STUDY IN A TERTIARY CARE CENTRE"** is a bonafide research work done by **REG. NO: BE0121001.**

Dr.Rajendra B. Metgudmath$_{MS}$
Professor and Head,
Department of Otorhinolaryngology
and Head and Neck Surgery,
J. N. Medical College,
Nehru Nagar, Belagavi

Date : 29/06/2024
Place : Belagavi

Dr.(Mrs.) N.S. Mahantshetti$_{MD}$
Principal,
J. N. Medical College,
Nehru Nagar, Belagavi

PRINCIPAL
J.N. Medical College,
BELAGAVI- 590 010

Date : 29/06/2024
Place : Belagavi

UNDERTAKING

I, **(Reg.No.BE0121001),**hereby declare that the information and the data mentioned in my dissertation entitled **"STUDY OF RELATIONSHIP BETWEEN BLOOD GROUPS AND THROAT CULTURE SENSITIVITY FINDINGS IN PATIENTS WITH CHRONIC TONSILLITIS, A ONE YEAR CROSS SECTIONAL STUDY IN A TERTIARY CARE CENTRE"** belongs to me and is original. I am aware of the definition of plagiarism as detailed below:

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

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

Date: 29/06/2024 A.E.J

Place: Belagavi **REG. NO: BE0121001**

PLAGIARISM CERTIFICATE

KLE ACADEMY OF HIGHER EDUCATION AND RESEARCH

JAWAHARLAL NEHRU MEDICAL COLLEGE

(A constituent unit of KLE Academy of Higher Education & Research Deemed-to-be-University)

(Recognized by National Medical Commission, New Delhi)

Accredited 'A+' Grade by NAAC (3rd Cycle) **Placed in Category 'A' by MoE (GoI)**

Nehru Nagar, Belagavi- 590 010, Karnataka, INDIA

0831 – 2471350 0831 – 2470759 www.jnmc.edu rincipal@jnmc.edu

Ref No: MDC/PG/ Date: 24-06-2024

"ACCEPTANCE LETTER"

The softcopy of thesis entitled: **"STUDY OF RELATIONSHIP BETWEEN BLOOD GROUPS AND THROAT CULTURE SENSITIVITY FINDINGS IN PATIENTS WITH CHRONIC TONSILLITIS, A ONE YEAR CROSS SECTIONAL STUDY IN A TERTIARY CARE CENTRE"** has been submitted for anti-plagiarism check through Turnitin software. The scan has been carried out and the scanned output reveals a match percentage of **06%** which is within the acceptable limits of **10%** as per the guidelines given by UGC.

Guide.

KAHER BELAGAVI J. N. MEDICAL COLLEGE

Dr. (Mrs.) N.S. Mahantashetti.
Chairperson-Antiplagiarism Committee &
Principal,
J. N. Medical College, Belagavi.

To,
Reg. No. BE0121001
Postgraduate Student,
2021-22 Batch,
Department of E.N.T.
J. N. Medical College, Belagavi.

ETHICAL CLEARANCE CERTIFICATE

Accredited 'A+' Grade by NAAC in (3rd Cycle) Placed in Category 'A' by MHRD (GoI)

JNMC INSTITUTIONAL ETHICS COMMITTEE
JAWAHARLAL NEHRU MEDICAL COLLEGE,
NEHRU NAGAR, BELAGAVI-590010 (KARNATAKA-INDIA)

Website: http//www.jnmc.edu
E-Mail : dome@jnmc.edu

Phone: (+ 91-(0)831 Office : 2472550
Principal: 2471701
Fax No. +91 (0)831 – 2470759

Ref No.MDC/JNMCIEC/246 **Date: 7/11/2022**

To.

REG. NO: BE0121001
PG Student in Otorhinolaryngology and Head and Neck Surgery,
J. N. Medical College,
BELAGAVI.

Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled **"STUDY OF RELATIONSHIP BETWEEN BLOOD GROUPS AND THROAT CULTURE SENSITIVITY FINDINGS IN PATIENTS WITH CHRONIC TONSILLITIS, A ONE YEAR CROSS SECTIONAL STUDY IN A TERTIARY CARE CENTRE"**, is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee.

(Dr. Smita Sonoli)
Member Secretary
JNMC Institutional Ethics Committee
J.N.Medical College, Belagavi.

For **(Dr. Harsha Hegde)**
Chairman,
JNMC Institutional Ethics Committee
J.N.Medical College, Belagavi

LIST OF ABBREVIATIONS

GLOSSARY	ABBREVIATIONS
Hb	Hemoglobin
CN	Cranial Nerve
Ig	Immunoglobulin
GABHS	Group A beta hemolytic streptococci
JD nodes	Jugulo digastric nodes
GN	Glomerulonephritis
VEGF	Vasculo endothelial growth factor
et al	et alii(latin; ‘and others’)
CoNS	Coagulase-negative Staphylococci
MRSA	Methicillin-resistant Staphylococcus aureus

ABSTRACT

BACKGROUND:

Since studies showed that antigens & antibidies are inherited, relation between 'blood type' and 'diseases' have been studied. There exists questions involving " *blood type"* and predisposition to certain diseases. Chronic tonsillitis occurs due to multiple repeated infections of the tonsils caused by bacteriae and viruses. Connection between blood types & throat swab sensitivity results in "chronic tonsillitis" is the focus of this research.

OBJECTIVES:

To find out relationship between throat culture findings & blood groups in chronic tonsillitis patients.

MATERIALS AND METHODS:

94 patients from 3-35 years, who visited the ENT OPD with complaints suggestive of chronic tonsillitis at Dr.Prabhakar Kore Hospital and Medical Research Centre, Belagavi were selected. Clinical history and ENT examination were followed by collection of throat swabs and sent for culture study. Rh factor and ABO blood groups were investigated.

RESULT:

Majority had B +ve blood group followed by O+ve . And in B+ve blood group, majority of cultures grew streptococcal species (42.42%). Most patients had grade II tonsillar hypertrophy mostly due to throat commensals followed by grade III tonsillar hypertrophy which is mainly due to streptococcal species.

CONCLUSION:

Present study shows a positive association between blood groups and throat culture findings & also between culture findings & grade of tonsillar hypertrophy.

KEYWORDS: ABO blood type ; Rh factor ; Antigens ; Immunoglobulins ; chronic tonsillitis ; Throat culture sensitivity .

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF PHOTOGRAPHS

INTRODUCTION

ABO blood type antigens in humans have different morphological traits and generated glycoconjugate structures which are inherited, on the surface of red blood cells that actively contribute to the physiology and pathology of the cells. Since researchers learned that antigens and immunoglobulins shows inheritance patterns, associations between 'blood type' and 'disease' have been investigated. Neverthless, there exists debatable questions about connection involving "*ABO blood type"* and predisposition to certain disease conditions due to lack of antigens in certain groups of blood.[1]

Located in the tonsillar fossa between the anterior and posterior tonsillar pillars, the paired palatine tonsils are composed of lymphoid tissue. Along with the dispersed aggregates of the pharyngeal submucosal lymphoid tissue, the lingual tonsils, tubal tonsils, and adenoids they make up Waldeyer's ring is lymphoid. Lymphoid tissue makes up the tonsils with germinal centres located immediately submucosally and fulfills a humoral and cell-mediated immunological role.[2]

Adolescents & children shows high prevalence for tonsillitis. Bacteriae and viruses are the known causative agents and presents with similar signs.[3]The duration of acute tonsillitis is 4 - 6 days. Acute tonsillitis frequently manifests as fever, painful throat, and difficulty swallowing, red swollen tonsils, and tender jugulodigastric lymphnodes.[4].

Tonsillitis which is chronic is a long lasting condition which happens due to multiple repeated infections of tonsil. Each of the lymphatic structure that is part of Waldeyer's ring are affected by the inflammation.[5] Based on external sorrounding elements and patient factors this condition has multiple etiological factors. The

genetic alteration of the innate immunity of the patient explains the host susceptibility for chronic tonsilliitis.[6]

Streptococci belonging to group A is the cause of approximately 14 to 15% of the condition. Ignorance about this organism can lead to improper management. Anti microbial treatment is justified for streptococci species only. Use of antimicrobial therapy for non bacterial tonsillitis can lead to the development of resistence to anti biotics in these strains.[3]

Also streptococcal infection can lead to severe post infectious sequele like glomerulo nephritis or rheumatic fever.[7] Its reportedly stated that tonsil infection can enter the middle ear cleft through eustachian tube, the para nasal sinuses and the upper aerodigestive tract. Recurrent infection may be caused by food particles, microbial organisms, shedded epithelium present inside crypts.[8] So for the proper treatment of the condition pathophysiology and microbes involved have to be understood. In comparison with normal kids, the ones with this condition has bad general health condition making the need for early diagnosis and treatment necessary. [5]

The most common cause of chronic tonsillitis is viral infection particularly adenovirus which covers approximately 80-90%. Commonly affect children and young adults in the age group of 3-18. The majority of bacterial causes of " chronic tonsillitis" is "group A beta-hemolytic streptococcus", covering approximately 14-16%. Other than streptococci, other bacteriae responsible are Haemophilus influenza, Staphylococcus aureus including Methicillin-resistant Staphylococcus aureus, mixed flora being quite common. Connection between blood types & throat swab sensitivity results in "chronic tonsillitis" is the focus of this research.[9]

OBJECTIVES

- To find out the relationship between culture sensitivity findings and blood groups in chronic tonsillitis patients.

REVIEW OF LITERATURE

RBC's (erythrocytes) are biconcave discs with diameter of approximately 7.2 micrometer and is about 2.2 micrometers thick at the periphery and 1 micrometer or less in the center. The average volume is 90 to 95 cu.mm

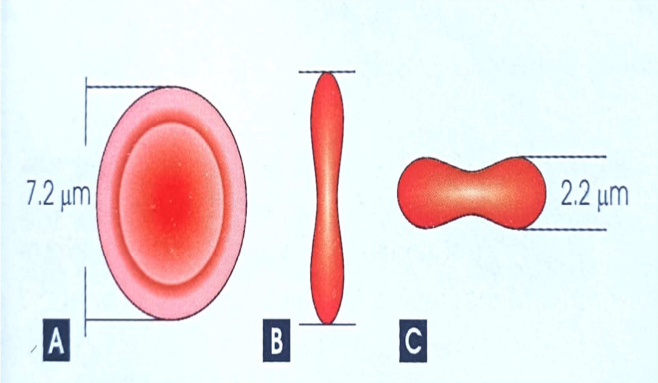


Figure 1: Size and Shape of a normal red blood cell[10]

One of the main role of a red blood cell is transportation of hemoglobin which delivers O2 to tissues from lungs. Besides transport of hemoglobin, RBC's have high quantities of enzyme carbonate dehydratase which catalyzes the reaction between H_2O and CO_2 forming carbonic acid (H2CO3) , accelerating this process by thousands of times. Because of how quickly this reaction occurs, blood water can carry massive volumes of CO2 and be released into the surroundings as a waste product. Additionally, cells' hemoglobin functions as a superb acid-base buffer, thus helps in acid base buffering.

Blood types differ in their antigenic and immunological characteristics, causing antibodies in one person's plasma to react with antigens on the surface of another person's RBC's.

Its possible to predict in advance whether the antibodies and antigens in the recipient's and donor's blood will result in a transfusion reaction by taking the necessary safety measures. Blood transfusion responses are far more likely to be caused by two specific antigen types than by the others. They are the Rh system and the ABO antigen system.[11]

Due to the mendelian dominant nature of the A and B antigens, people are classified into four primary blood types. People who identify as " type A" have the A antigen, "type B" has the B antigen, "type AB" has both, and "type O" has neither. [12]

Rh GROUPS: Rh factor is a system that is mainly made up of the C, D, and E antigens, however it contains many more. It was called after the rhesus monkey since it was investigated using the blood of this animal. Since agglutinogen D is by far the most antigenic component, the word "Rh-positive," as it is commonly used, indicates that the person possesses it. When injected with D-positive cells, the Rh-negative person produces anti-D agglutinin because they lack the D antigen. The majority of Asians 99% are D-positive.

Blood typing :- Initially, the RBCs are extracted from the plasma and then diluted using saline. Next, one parts combined with anti-A agglutinin and the other with anti-B agglutinin. The combinations are examined under a microscope after a few minutes. An antibody-antigen reaction has occurred if the red blood cells have clumped together, or been "agglutinated." Anti-A and anti-B agglutinins do not bind to type O red blood cells because they lack agglutinogens. Because type A blood contains A agglutinogens, it binds to anti-A agglutinins causing agglutination. B agglutinogens and anti-B agglutinins agglutinate in type B blood. Both A and B

agglutinogens are present in AB blood and hence agglutinates with both types of agglutinins.[11]

(+) denotes agglutination		*(–) denotes no agglutination*			
Agglutination		*Your blood group is*	*Your RBCs contain agglutinogens*	*Your plasma contains agglutinins*	*Your plasma will agglutinate RBCs of group*
Anti-A serum	*Anti-B serum*				
+	–	A	A	Anti-B	B, AB
–	+	B	B	Anti-A	A, AB
+	+	AB	A, B	None	None
–	–	O	O	Both anti-A and anti-B	A, B, AB
Similarly, for Rh blood group:					
Agglutination	+ Your RBCs contain Rh(D) antigen. You are Rh +ve				
No agglutination	– No Rh(D) antigen in your red cells. You are Rh –ve				

Table 1: Table showing determination of blood groups[12]

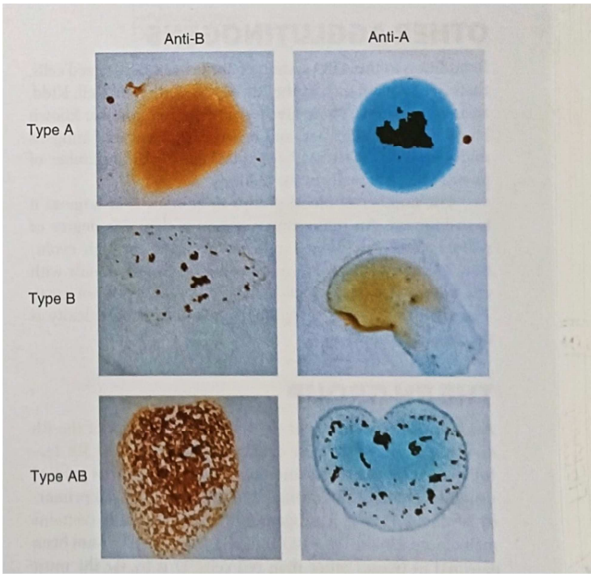


Image 1: Red cell agglutination in incompatible plasma[13]

Certain groups of blood show susceptibility to certain diseases. Individuals with blood type O are more prone to developing peptic ulcers. Blood type A is more prevalent in stomach cancer cases and, to a lesser extent, in cases of diabetes mellitus. There is shown to be a link between blood group B and ovarian cancer and blood group A and

chronic hepatitis-B infection and pancreatic cancer, respectively. Blood group O individuals are shown to be in some degrees protected against falciparum malaria.[14].

THE PALATINE TONSILS

The components that make up the palatine tonsils are lymphoid tissues. They are situated in the tonsillar fossa, which is between the palatoglossus and palatopharyngeus muscles, which form the anterior and posterior tonsillar pillars, respectively.

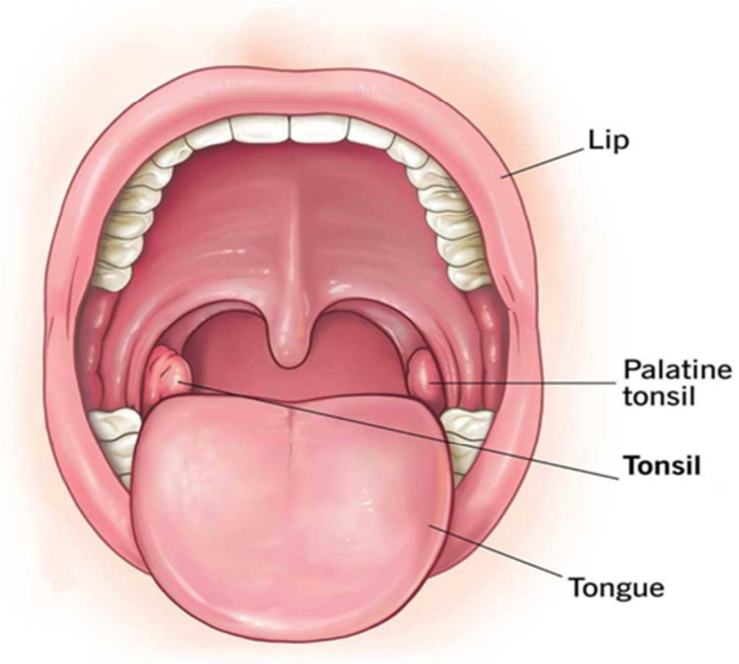


Figure 2: Palatine Tonsils [17]

- They comprise Waldeyer's ring, together with the lingual tonsils, tubal tonsils, adenoids, and pharyngeal sub mucosal lymphoid tissue.

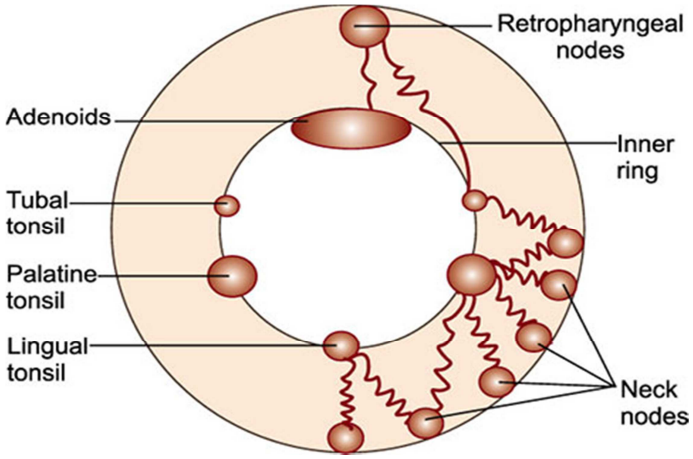


Figure 3: Waldeyer's Lymphatic ring[16]

- The tonsils are in the shape of an almond and have :-

  2 surfaces – Lateral surface, Medial surface

  2 borders – Posterior border, Anterior

  2 Poles – Lower, Upper

- The tonsil hemi-capsule is formed by a strip of fascia covering the lateral surface. The pharyngobasilar fascia extends forming the capsule. The tonsil suspensory ligament is firmly attached to the tongue anteriorly, just in front of the insertion of the palatoglossus and the palatopharyngeus muscle and connects the capsule to tongue. It is only loosely attached to the muscular wall of the pharynx, which is formed by the superior constrictor and the styloglossus. The tonsil stays in place during swallowing because of this strong connection.
- Tonsillar bed is formed medial to lateral by :

a) The pharyngobasilar fascia

b) The superior constrictor and palatopharyngeus

c) The buccopharyngeal fascia

d) The styloglossus in the lower part

e) The 9th CN.

- The facial artery, with its tonsillar and ascending palatine branches, is located still laterally. The paratonsillar vein emerges from the palate within the loose areolar tissue on the capsule's lateral aspect, traverses the tonsil, and then penetrates the pharyngeal wall.

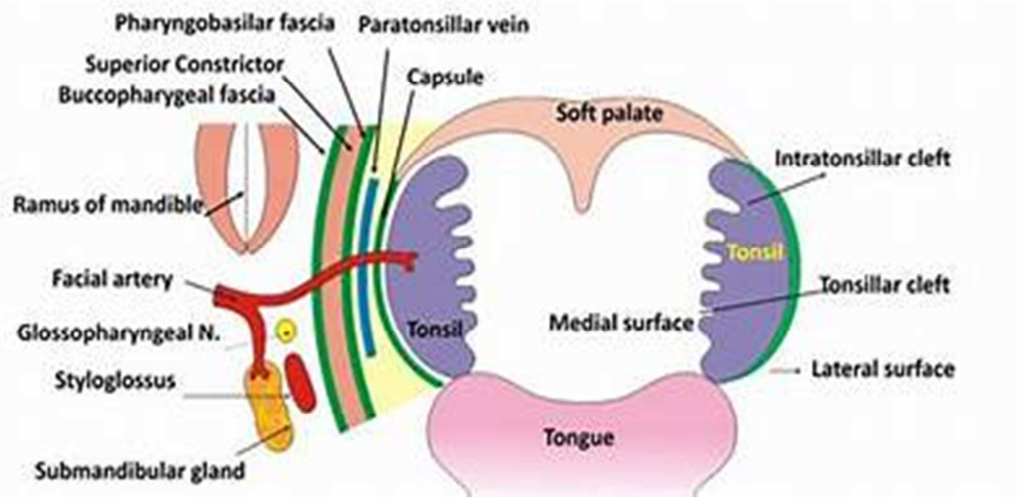


Figure 4: Tonsillar bed[16]

- Arteries supplying tonsil

  Principal source: The facial artery's tonsillar branch

Other sources:

a) Facial artery's ascending palatine branch

b) Lingual artery's dorsal lingual branches

c) Ascending pharyngeal branch of external carotid artery.

d) The greater palatine branch of maxillary artery

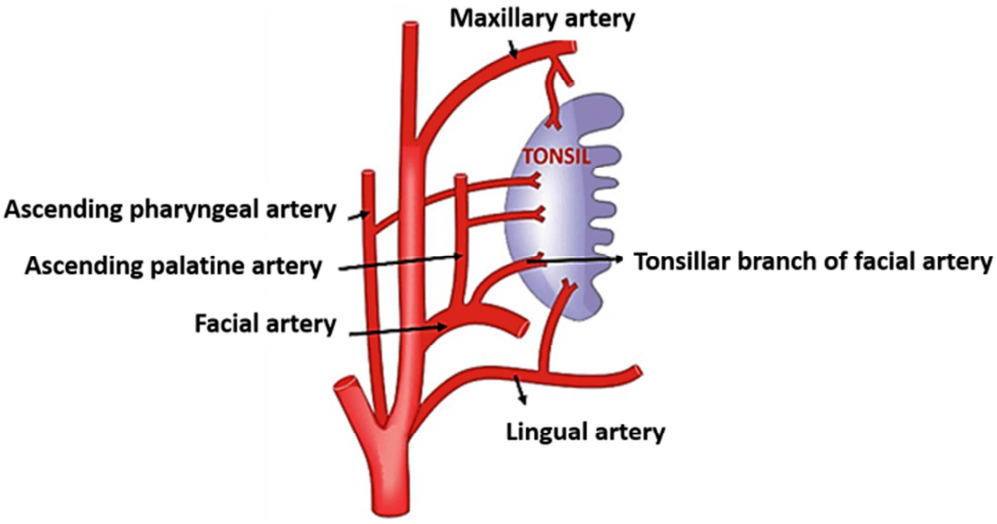


Figure 5: Arterial supply of tonsil[16]

- Venous Drainage:

  The tonsil veins empty into the paratonsillar vein, which connects to the pharyngeal venous plexus through common facial vein.

- Lymphatic Drainage:

  The tonsil's lymphatics penetrate the superior constrictor and empty into the upper deep cervical nodes, especially the tonsillar (jugulodigastric) node, which is located beneath the mandibular angle.

- Nerve supply:

The glossopharyngeal nerve and the smaller palatine branches of the sphenopalatine ganglion (trigeminal nerve) supply sensory supply.

HISTOLOGY

- There are lymphatic nodules embedded in the diffuse lymphoid tissue that makes up each palatine tonsil, whether on the left or right. The stratified squamous epithelium covering the lymphoid tissue is continuous with the oral and pharyngeal epithelium. Through the formation of several tonsillar crypts, this epithelium penetrates into the tonsil tissue. The crypts are the openings of many mucous glands. Typically, lymphocytes that have entered a crypt through epithelium can be found in its lumen.
- Desquamated epithelial cells and bacteria are also frequently present in the lumen of the crypt

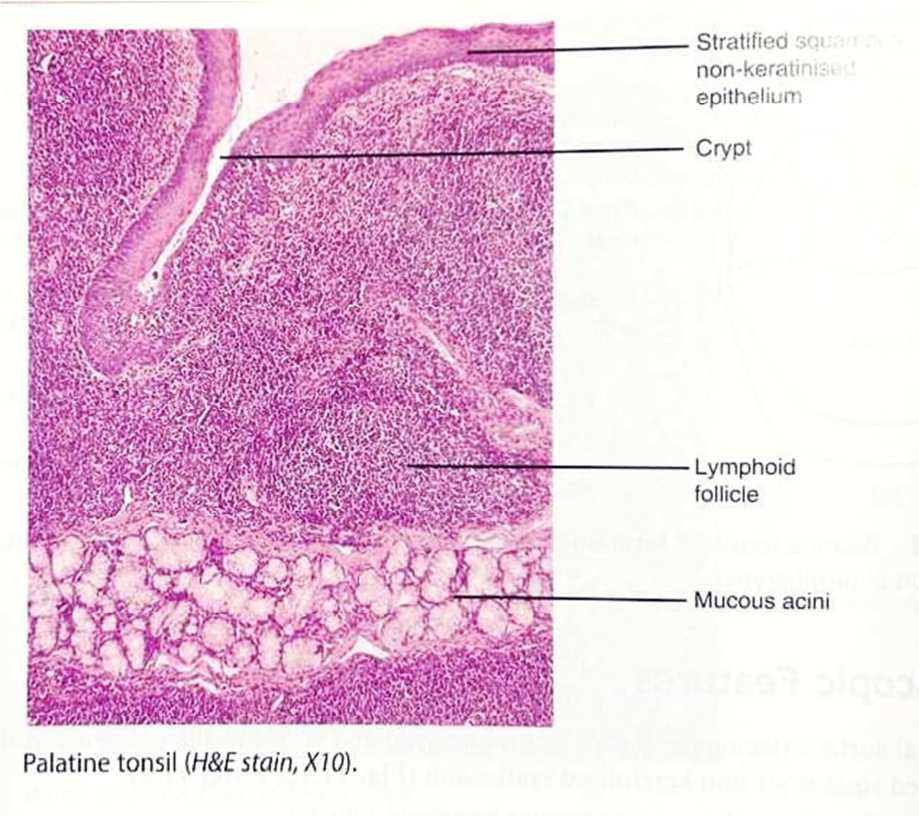


Image 2: Histology of Palatine tonsil (*H&E, X10,plain*)[17]

DEVELOPMENT

- The endoderm of the ventral portion of the second pharyngeal pouch gives rise to the tonsil.
- Early in 3rd month , lining epithelium proliferates to form solid tonsillar buds, which grow into the underlying mesoderm. The central cells degenerate to form hollow tonsillar crypts. Lymphatic tissue infiltrates during 3-5th month and are mesodermal in origin. The tonsillar capsule is formed by the condensed mesoderm.

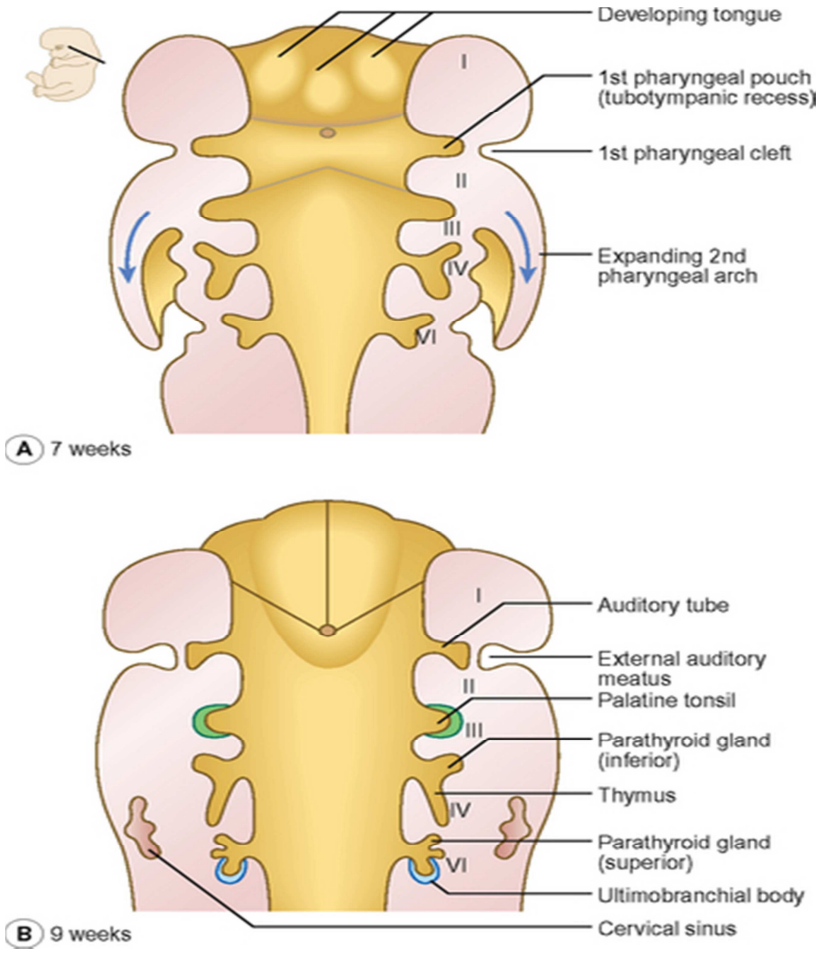


Figure 6 : Development of tonsil[18]

FUNCTIONS OF THE TONSIL

The tonsils are composed of lymphoid tissue with germinal centres located immediately submucosally. Although B lymphocytes predominate, both T and B cells are present. The humoral and cell-mediated immune systems are both supported by tonsils.

They have no afferent lymphatics. The B-cells have the capability to produce certain immunoglobulins. Immunoglobulin IgG and IgA plasma cells are generated in response to antigen exposure. Thus, contact with allergens in the upper respiratory tract boosts both the development of systemic immunity and local immunity.[19]

INFLAMATORY CONDITIONS

TONSILLITIS (ACUTE)

- Acute tonsil inflammation can occur locally, in connection with an upper respiratory infection, or as a component of a systemic infection that affects the entire body, like infectious mononucleosis.
- Although a variety of other organisms, such as viruses and anaerobes, may be involved, GABHS is typically the causal agent.[7,20]
- Clinical evaluation is the major factor used in the diagnosis of acute tonsillitis. There is a brief history of fever, sore throat, and difficulty swallowing.
- Examining the tonsils and posterior pharyngeal wall usually reveals erythema, with sporadic noticeable exudates on the tonsils. Usually, there is sensitive jugulodigastric lymph node enlargement linked to this. Acute tonsillitis is caused by both bacteria and viruses, either alone or in combination.

- The primary treatment for acute tonsillitis is symptomatic, meaning that symptoms are managed with analgesics and fluids until they go away. Antibiotics can lessen the chance of side effects and shorten the duration of the illness. If the patient's condition does not improve within 48–72 hours, antibiotics should be administered; benzyl-penicillin is the recommended medication.
- Antibiotics should be started as soon as possible if there is clinical concern .
- Chronic tonsillitis, Peritonsillar abscess (quinsy), retropharyngeal abscess, parapharyngeal abscess, lemierre's syndrome, immune complex disorders, psoriasis, obstructive sleep apnea, internal jugular vein thrombosis, ascending infections resulting in eustachian tube dysfunction, acute otitis media, and otitis media with effusion are among the complications of acute tonsillitis.
- Acute nephritis, Rheumatic fever, downward spread of infection leading to bronchitis or exacerbation of asthma, can act as a source of infection to eyes, skin, joints, septicemia.[16,9]

Image 3: Acute catarrhal tonsillitis[16]

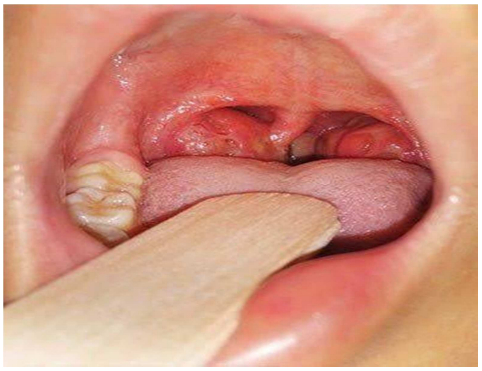


Image 4: Acute parenchymatous tonsillitis[16]

Image 5: Acute follicular tonsillitis[16]

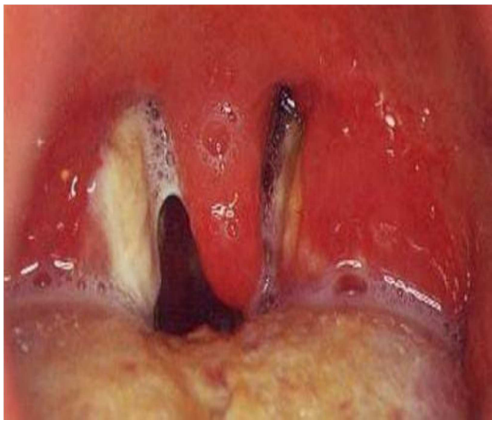


Image 6: Acute membranous tonsillitis[16]

CHRONIC TONSILLITIS

Occurs from acute tonsillitis that is not properly managed. Minute abscesses within the lymphoid follicles caused by recurrent infection are surrounded by inflammatory cells and blocked off by fibrous tissue.

Types

1) Chronic follicular tonsillitis: Tonsillar follicles are inflamed and swollen. The crypts are filled with exudates. The inflammation is common in adults
2) Chronic parenchymatous tonsillitis: The lymphoid follicles undergo hyperplasia resulting in uniform enlargement of the tonsil due to recurrent attacks of acute tonsillitis. It is common in children
3) Chronic fibrotic tonsillitis: The tonsils atrophy and are small in size but may get infected leading to recurrent attacks.[16,19]

Image 7:Chronic follicular tonsillitis [16]

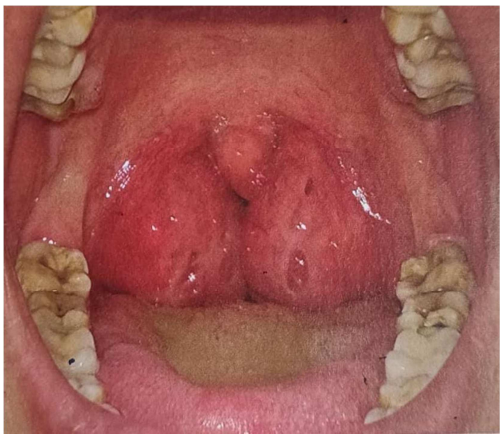


Image 8:chronic parenchymatous tonsillitis[16]

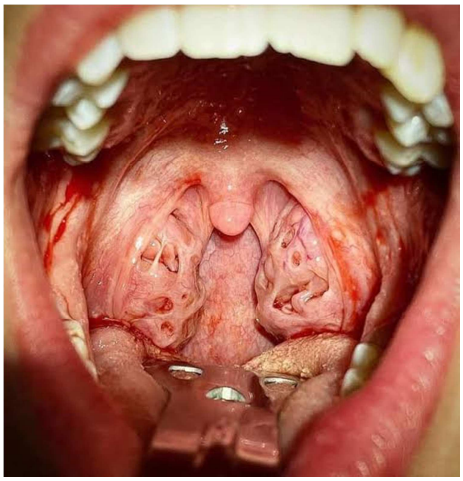


Image 9: Chronic Fibrotic Tonsillitis[16]

Clinical Features

Symptoms:

1. Recurrent attacks of throat
2. Prolonged throat inflammation accompanied with cough
3. Pus in crypts causing bad breath and bad taste in the mouth
4. Thick speech, trouble swallowing, and episodes of choking that occur at night (due to enlarged and obstructive tonsils).

Signs:

- Four Cardinal Signs:

1) Hyperemic anterior pillars
2) Enlargement of JD nodes
3) Pus emerges from the tonsil when pressure is applied to the anterior pillar (Irvin Moore sign)
4) Enlarged or atrophic tonsils[19]

Grades of Tonsillar Hypertrophy

Grade I : Less than 25% of tonsil occupies oropharynx (within tonsillar fossa)

II : Between 25-50% (tonsils till the edge of tonsillar fossa)

III : Between 50-75% (extends beyond the tonsillar pillars)

IV: More than 75% (touching each other/ kissing tonsils)[19]

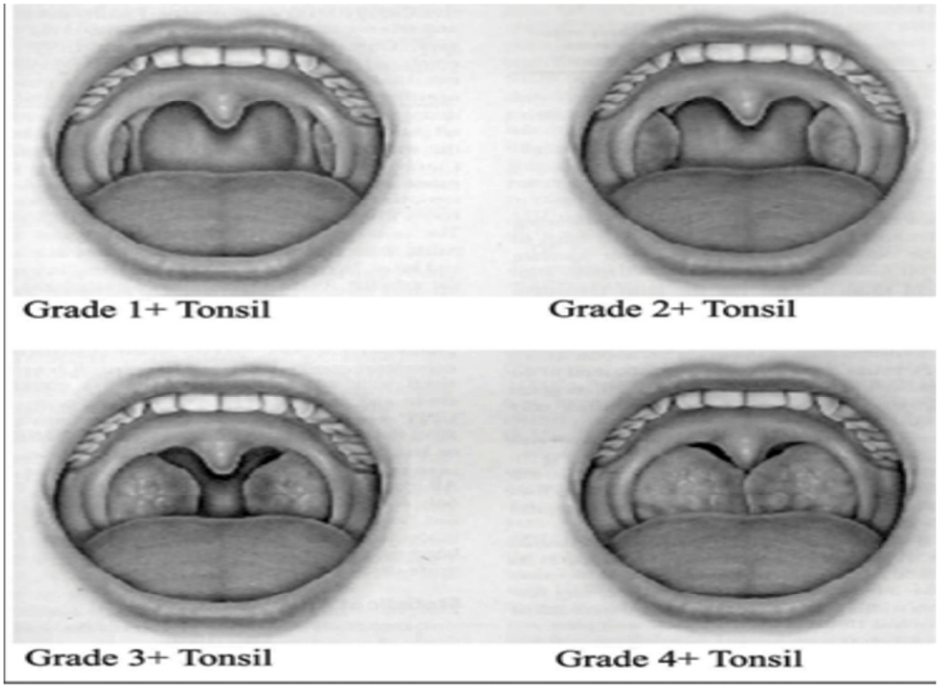


Figure 7: Grading of tonsillar hypertrophy[22]

COMPLICATIONS

1) Intra tonsillar abscess
2) Peri tonsillar abscess
3) Tonsillar cyst.
4) Tonsillolith
5) Parapharyngeal abscess
6) Focus of infection in cases of rheumatoid fever, acute glomerulonephritis, and skin and ocular conditions. [16,19]

TREATMENT

- Conservative treatment includes managing coexisting sinus, nasal, and dental infections as well as focusing on overall health and nutrition.
- When tonsils cause recurring attacks or restricted speech, deglutition, or breathing, tonsillectomy is necessary.[21]

APPEARANCE OF BACTERIAL GROWTH IN CULTURE MEDIA

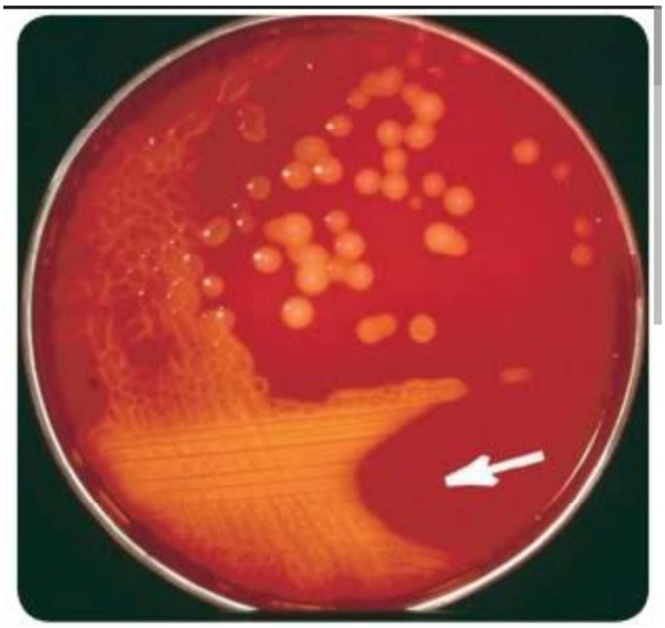


Image 10: Beta hemolytic colony of Streptococcus pyogens on blood agar[23]

Image 11: Metallic sheen colony of Pseudomonas aeroginosa on blood agar plate[23]

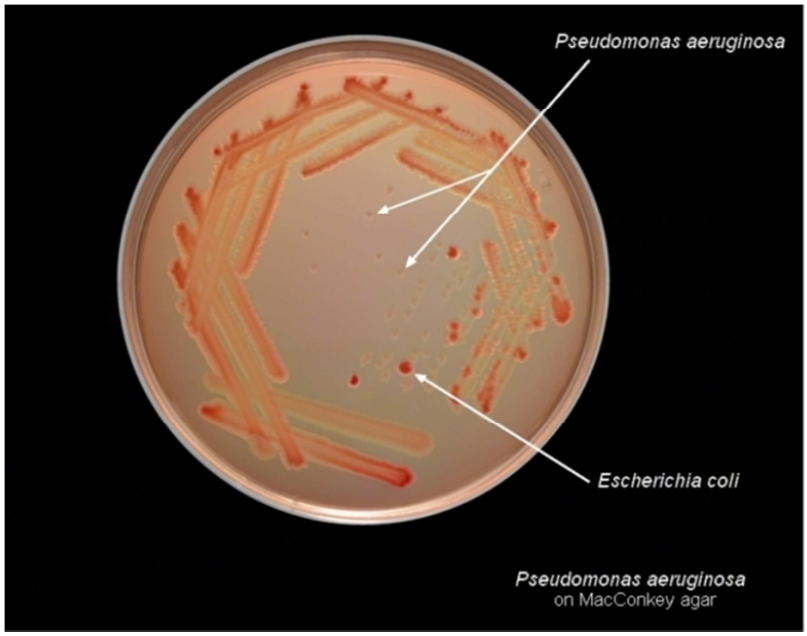


Image 12: Lactose negative colonies of Pseudomonas aeroginosa on MacConkey agar

Image 13: Growth of Staphylococcus aureus on mannitol salt agar[23]

Image 14 : Growth of MRSA on CHROMagar , showing formation of mauve-colored colonies.[23]

Image 15 : Growth of Klebsiella pneumoniae on MacConkey agar showing pink mucoid colonies.[23]

Image 16: colony of coagulase negative staphylococcus on blood agar[23]

Image 17: Growth of non hemolytic pasteurella species (throat commensal) on blood agar[23]

- Sudhakar Rao et al in a study on the correlation between blood types and throat swab results in pediatric patients with chronic tonsillitis discovered a strong correlation between tonsillar enlargement brought on by chronicity and Streptococcal species infection in school-age children of both genders. Streptococcus infections are more common in people with O-positive blood types than in those with B-positive blood types.[8]
- According to a study by Rana Talib AL-Ani et al. on the relationship between blood group and group A beta-hemolytic streptococci, concluded that tonsillitis caused by these bacteria more commonly affects people between the ages of 6 and 15 and Blood group O + had the highest frequency of tonsillitis while AB negative blood group had the lowest frequency.[3]
- In a study titled "Prevalence and Management of Chronic Tonsillitis: Experience From Secondary Care Hospitals in Rabak City, Sudan", Mujtaba Al-Ryah et al. discovered that tonsillectomy was the most common treatment for chronic tonsillitis, which was found to be more common in teenagers and to be highly prevalent in the city's agro-industrial area.[4]
- In an article by Ayse S.Safak et al. regarding the histological significance of vitamin D deficiency in the development of recurrent/chronic tonsillitis: After studying vascular epithelial growth factor-mediated angiogenesis in tonsils, it was determined that a vitamin D shortage increases the expression of VEGF in the tonsillar tissue, which contributes to the pathophysiology of chronic and recurrent tonsillitis.[26]
- Adetayo AM et al's study on the relationship between oral hygiene and the onset of tonsillitis or tonsillar hyperplasia found that there appears to be a connection between oral hygiene and tonsillar infection. As a result,

otolaryngologists who treat tonsillar infections should take an interdisciplinary approach to treating tonsillar diseases.[27]

- The results of a study by Mahmoud Elawamry et al. on the detection of Helicobacter pylori using Giemsa staining in patients with chronic tonsillitis revealed that 40% of the patients had H. pylori in their tonsil tissue when using the Giemsa modification staining method. This finding suggests that H. pylori may be one of the etiologic factors contributing to the development of chronic tonsillitis.[28]

METHODOLOGY

Design of study: Cross sectional study

Period of study: 1year (September 2022 – August 2023)

Population of study:

Patients diagnosed with Chronic tonsillitis who presented to ENT OPD at "the KLES Dr.Prabhakar Kore Hospital and Medical Research Centre and Charitable Hospital, Belagavi"

Sample Size: 94

Ethical Clearance: Obtained from the Institutional Ethics Committee

Inclusion criteria:

1. All chronic tonsillitis cases of age 3 to 35 years

Exclusion criteria:

1. Acute tonsillitis patients

2. Unilateral peritonsillitis patients

3. Membraneous tonsillitis patients

4. Patients with immunocompromised conditions Iike Cancer, AIDS,

5. Patients taking immunosuppressive treatment.

Sample size formula:

Based on prevalence rate the minimum sample size formula is

$$n = \frac{z\alpha^2 P(1-P)}{d^2}$$

Where, 'P' is the prevalence rate and is the percentage likely difference in the prevalence.

z_α is associated with the level of significance. For 5% level of the significance

z_α= 1.96.

When P = 42.2%, (1-p) = 57.8% and d = 10% the sample size is

93.7. To round off, the sample size will be increased to 94.[24]

Procedure:

- Study population was selected among patients on simple random basis
- They were counselled regarding the study
- Informed assent statement is taken for minors aged 13 to 18 and a Verbal assent statement is taken for minors aged 7 to 12
- Throat swabs were collected and used in the culture study.
- The Rh factor and ABO blood groups were further investigated .

Statistical analysis:

- IBM USA's SPSS 23.0 version was used to analyze data that was entered into an MS Excel sheet.
- Proportions will be used to express Qualitative data.
- The mean and Standard deviation will be used to express quantitative data.
- The Chi-square / Fischer's exact test will be used to determine whether two qualitative variables are associated.
- Each variable's descriptive statistics will be shown as mean, Standard deviation, and standard error of mean.
- A P value less than 0.05 is regarded as statistically significant, while a P value less than 0.001 is regarded as extremely significant.

RESULT

94 subjects within the age group of 3 to 35 years who had verified chronic tonsillitis presented to the ENT OPD at "KLES Dr. Prabhakar Kore Hospital, Belagavi

1. Sex distribution

Among 94 patients incorporated in this study a male predominance was found

GENDER	NUMBER	PERCENT
M	52	55.32
F	42	44.68
Total	94	100.00

Table 2: Gender distribution of the sample

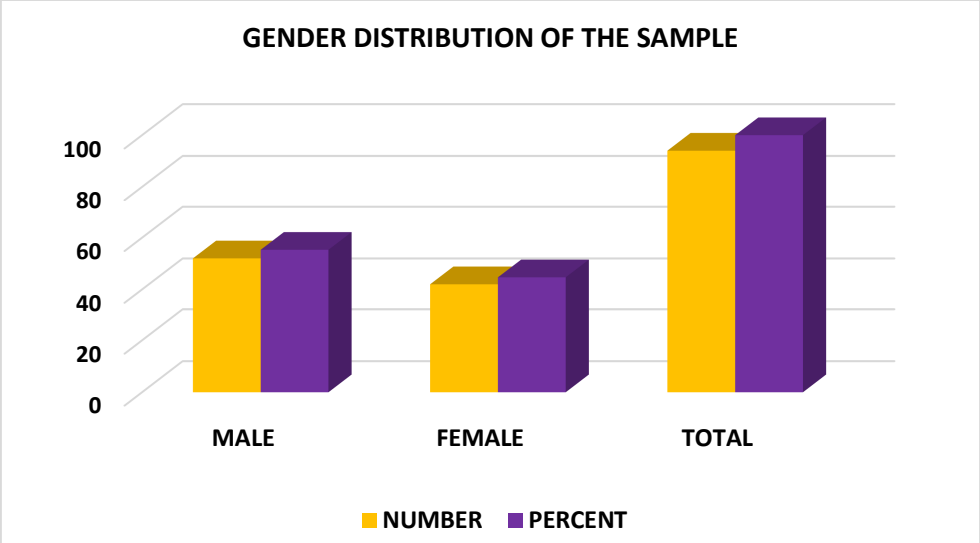


Figure 8 : Gender distribution of the sample

2. Age distribution

Majority of the study population comes under the age of 18years (53.19%) . Among that 28.72% of the study group belongs to the age group of 6-12years and 24.47% belongs to the age group of 13 t o18 years

AGE (years)	NUMBER	PERCENT
6-12	27	28.72
13 - 18	23	24.47
19 - 24	12	12.77
25 - 30	13	13.83
≥ 30	19	20.21
TOTAL	94	100

Table 3: Age distribution of the sample

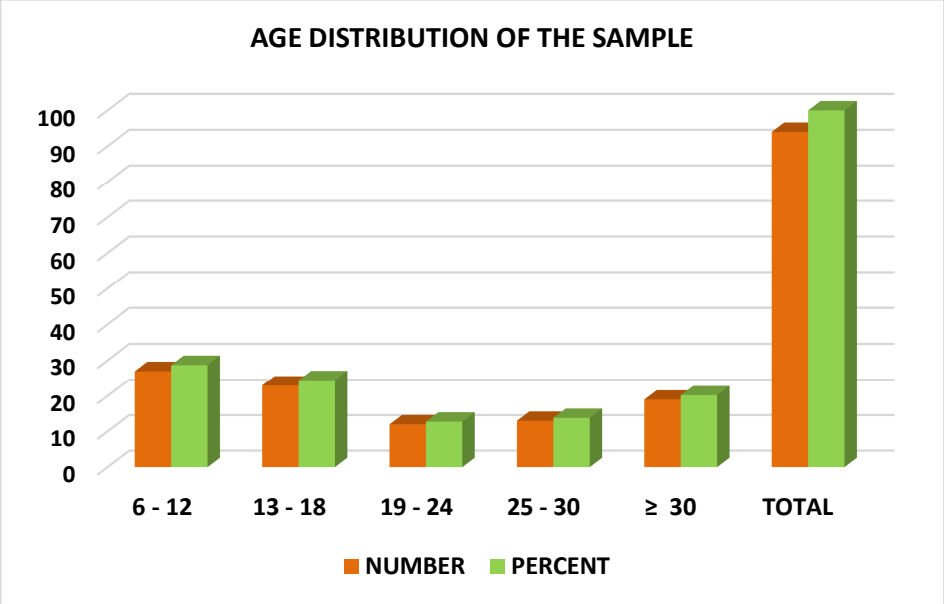


Figure 9: Age distribution of the sample

3. Grading of tonsillar hypertrophy

	GRADE OF TONSILLAR HYPERTROPHY			PERCENTAGE		
CULTURE FINDINGS	**II**	**III**	**TOTAL**	**II**	**III**	**TOTAL**
CoNS	4	2	6	6.35	6.45	6.38
Enterobactercloaceae	2	0	2	3.17	0	2.13
Enterobacterspp	1	0	1	1.59	0	1.06
K.pneumonia	3	1	4	4.76	3.23	4.26
K.pneumoniae	3	1	4	4.76	3.23	4.26
MRSA	3	0	3	4.76	0	3.19
P.aeruginosa	7	5	12	11.11	16.13	12.77
S.aureus	1	0	1	1.59	0	1.06
S.aureus	2	0	2	3.17	0	2.13
Strep spp	8	18	26	12.7	58.06	27.66
Throat commensals	26	4	30	41.27	12.9	31.91
No organism	3	0	3	4.76	0	3.19
Total	63	31	94	100	100	100

Table 4: Grading of tonsillar hypertrophy

4. Association between culture findings and grades of tonsillar hypertrophy

Among the 94 patients in the study , 63 patients(67.02%) were found to have grade II tonsilar hypertrophy while 31 patients (32.97%) were found to have grade III tonsillar hypertrophy. In our study 31.91% of the total cases of tonsillar hypertrophy were found to be due to throat commensals , 21.66% due to streptococcal species and 12.77% due to Pseudomonas aeroginosa. Majority of cases of grade II tonsillar hypertrophy were found to be due to throat commensals (41.27%) while majority of cases of grade III tonsillar hypertrophy were found to be due to streptococcal species (58.06%)

	GRADE OF TONSILLAR HYPERTROPHY			PERCENTAGE		
CULTURE FINDINGS	**II**	**III**	**TOTAL**	**II**	**III**	**TOTAL**
CoNS	4	2	6	6.35	6.45	6.38
Enterobactercloaceae	2	0	2	3.17	0	2.13
Enterobacterspp	1	0	1	1.59	0	1.06
K.pneumonia	3	1	4	4.76	3.23	4.26
K.pneumoniae	3	1	4	4.76	3.23	4.26
MRSA	3	0	3	4.76	0	3.19
P.aeruginosa	7	5	12	11.11	16.13	12.77
S.aureus	1	0	1	1.59	0	1.06
S.aureus	2	0	2	3.17	0	2.13
Strep spp	8	18	26	12.7	58.06	27.66
Throat commensals	26	4	30	41.27	12.9	31.91
No organism	3	0	3	4.76	0	3.19
Total	63	31	94	100	100	100

Table 5: Association between culture findings and grades of tonsillar hypertrophy

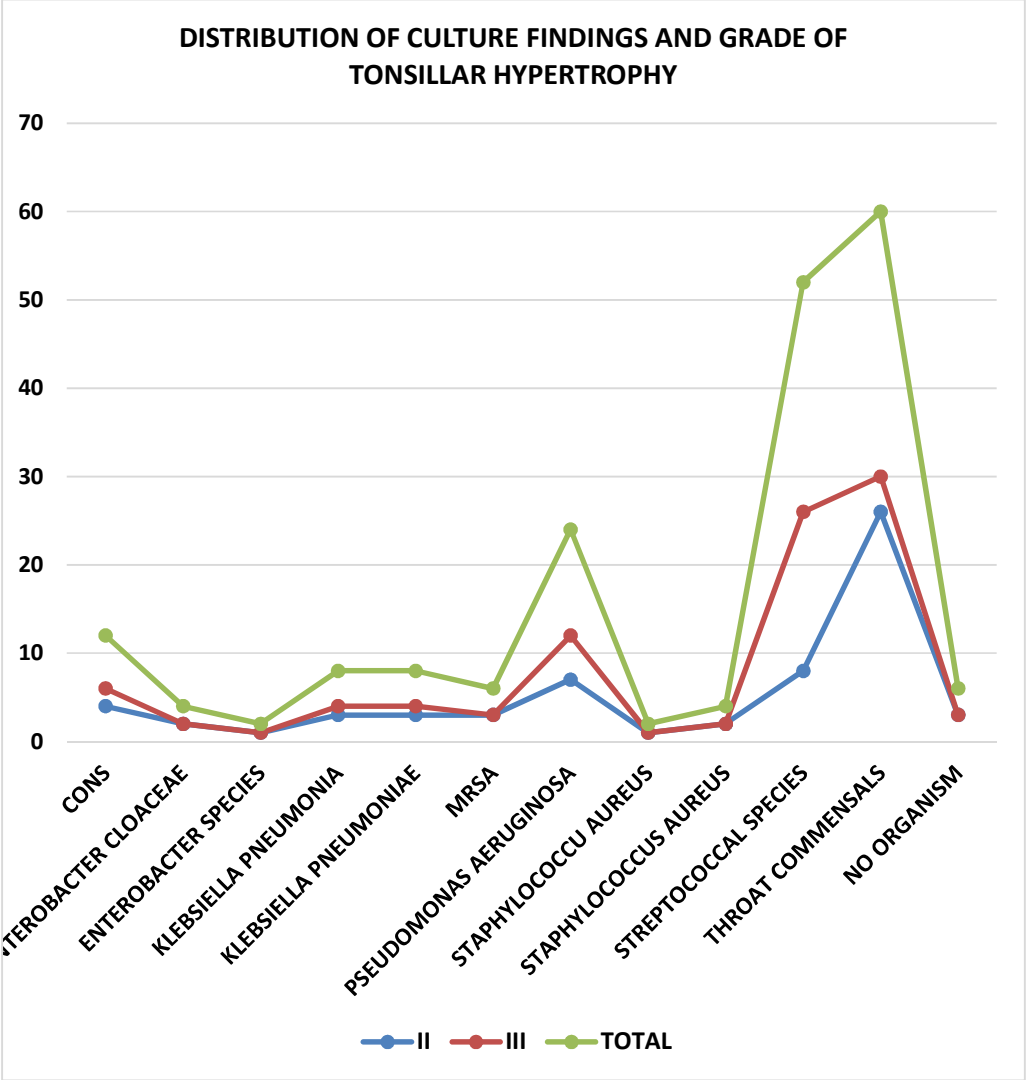


Figure 10: Association between culture findings and grades of tonsillar hypertrophy

5. Distribution of blood groups among the study participants

Among 94 patients with chronic tonsillitis majority of the patients (33 patients) belong to B+ve blood group (35.11%) while 21 patients had O+ve blood group (22.34%) , 20 patients had A +ve blood group (21.28%), 11 patients had AB +ve blood group (11.70%) , 4 patients each with A –ve and O –ve blood group (4.26%) , 1 patient had B-ve blood group (1.06%)

BLOOD GROUP	NUMBER	PERCENT
A +VE	20	21.28
A -VE	4	4.26
AB +VE	11	11.70
B +VE	33	35.11
B -VE	1	1.06
O +VE	21	22.34
O -VE	4	4.26
TOTAL	94	100.00

Table 6: Blood type Distribution

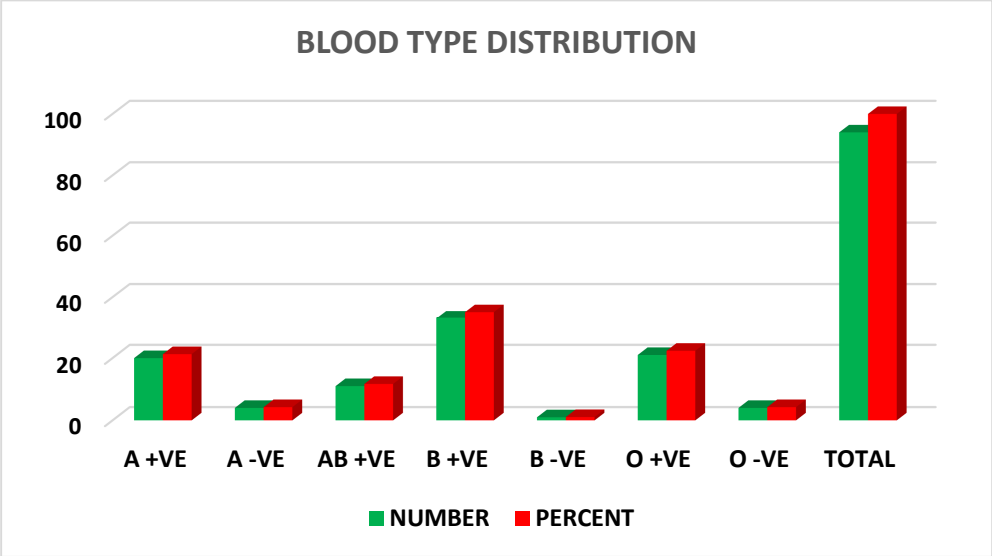


Figure 11: Blood type Distribution

6. Blood type distribution and gender

Among 52 male patients included in the study with chronic tonsillitis majority found to have B +ve blood group (21 cases) followed by O+ve (12 cases) , while among the 42 female patients majority found to have A +ve blood group (13 cases) followed by B +ve (12 cases).

	SEX		
BLOOD GROUP	**M**	**F**	**TOTAL**
A - VE	2	2	4
A + VE	7	13	20
AB + VE	7	4	11
B - VE	0	1	1
B + VE	21	12	33
O - VE	3	1	4
O + VE	12	9	21
TOTAL	52	42	94

Table 7: Blood type Distribution and gender

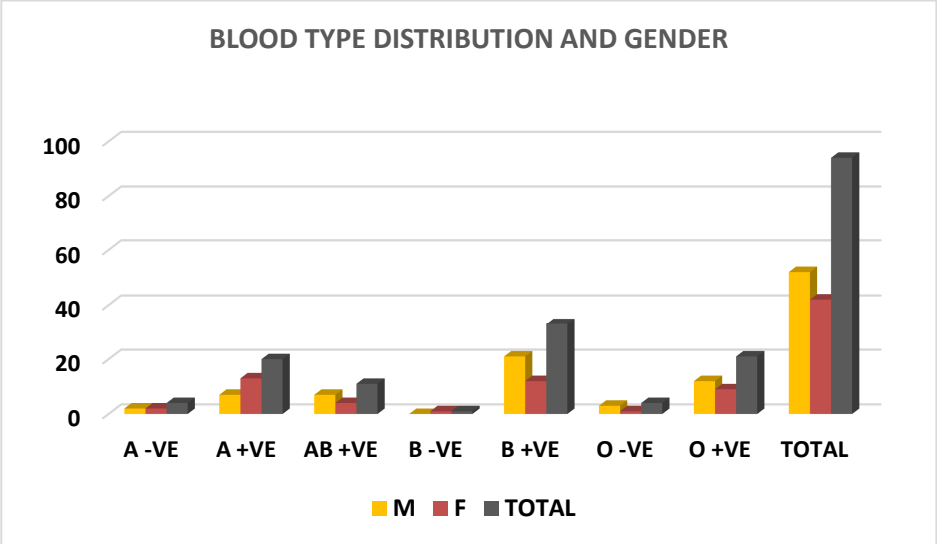


Figure 12: Blood type Distribution and gender

7. Distribution of culture findings and blood groups

Among the chronic tonsillitis patients B +ve blood group(35.10%) was found to be more common followed by O+ve (22.34%)and A +ve (21.27%). Among patients with B+ve blood group, majority of cultures grew streptococcal species (42.42%), while among O + ve and A + ve blood groups, majority of the cultures grew throat commensals comprising 47.6% and 55% respectively.

	BLOOD GROUPS							
CULTURE FINDINGS	**A -VE**	**A +VE**	**AB + VE**	**B - VE**	**B + VE**	**O - VE**	**O + VE**	**Total**
CONS	0	0	1	0	3	0	2	6
Enterobactercloaceae	1	0	0	0	0	0	1	2
Enterobacterspp	0	0	1	0	0	0	0	1
K.pneumonia	0	2	0	0	1	1	0	4
K.pneumoniae	0	1	1	1	1	0	0	4
MRSA	0	1	1	0	1	0	0	3
P.aeruginosa	0	2	3	0	5	0	2	12
S.aureus	0	0	0	0	1	0	0	1
S.aureus	0	1	0	0	0	0	1	2
Strepspp	2	2	2	0	14	2	4	26
Throatcommensals	1	11	1	0	6	1	10	30
No organism	0	0	1	0	1	0	1	3
TOTAL	4	20	11	1	33	4	21	94

Table 8: Distribution of culture finding and blood groups

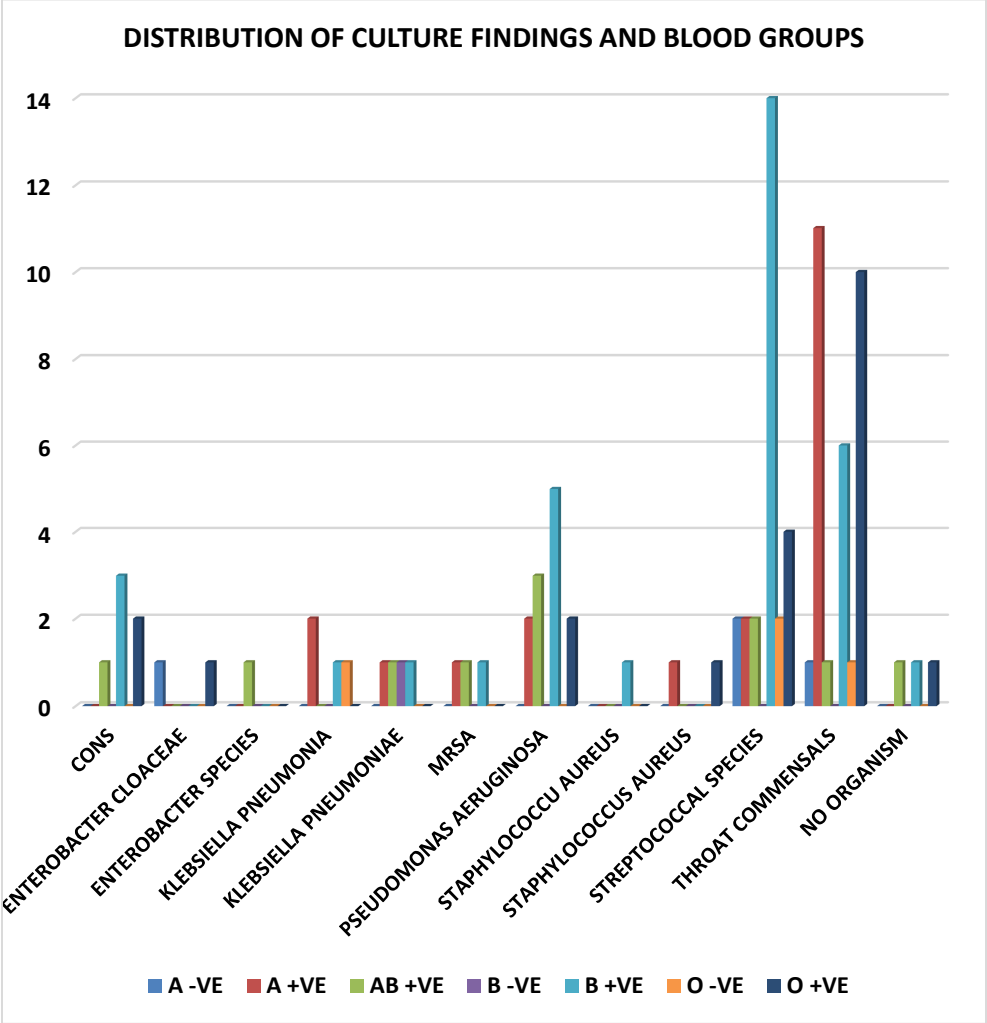


Figure 13: Distribution of culture finding and blood groups

DISCUSSION

SEX DISTRIBUTION

The current study comprised 94 cases of chronic tonsillitis, of which 52 were males and 42 were females, indicating a noticeable male predominance.

Similarly in a study conduted by Sudhakar Rao et al,[8] there were 31 males and 29 females out of the total 60 study population, which also showed a male predominance. In an another study by Al-Ani et al[3] in contrast to the current study, the total number of participants revealed a female predominance, with 24 (48.0%) males and 25 (52.0%) females.

AGE DISTRIBUTION

Present research shows that most cases belonged to the age group of 6 to 12 (27%) and 12 to 18 (23%) with a mean age of 19.71. In contrast to this where Stanford T et al [25] conducted a study where mean age (+/- Standard deviation) of cases were (8.1 +/- 3.5) falling into 3 to 18 years age group. In a different study conducted by Sudhakar Rao et al [8] majority cases (32) belonged to the age group of 6 to 10 (53.3%) and 25 patients belonged to 11-15 years age group (41.7%). In another study conducted by Al-Ani et al[3] majority of the cases belong to the age group of 6-15years (29 cases , 58%) and 16-25 years (10cases , 22%)

ASSOCIATION BETWEEN CULTURE FINDINGS AND GRADES OF TONSILLAR HYPETROPHY

Significant association was found between the culture findings and the grade of tonsillar hypertrophy. 63 (67.02%) patients were found to have grade two tonsillar hypertrophy while 31 (32.97%) patients found to have grade three tonsillar hypertrophy. 31.91 % of the total cases of tonsillar cases were found to be due to throat commensals and 21.66% due to streptococcal species. Majority of grade two tonsillar hypertrophy is found to be due to throat commensals (41.27%) while majority of cases of grade three tonsillar hypertrophy is mainly caused by streptococcal species (58.06%). In a study conducted by Sudhakar Rao et al [8] among 60 patients ,42 patients (70%) had grade three tonsillar hypertrophy while 14patients (23.3%) - grade two hypertrophy , 4 patients (6.7%) - grade four tonsillar hypertrophy. Similar to current study this study also has shown strong association between tonsillar hypertrophy and species of streptococcus genus (p value <0.05)

DISTRIBUTION OF BLOOD TYPE AMONG THE CASES

Among the total 94 cases of chronic tonsillitis patients included in the current research, majority of cases had B +ve (33 cases , 35.11%) followed by O+ve (21 cases , 23.34%), 20 patients were of A+ve blood group (21.28%) , 11 patients were of AB +ve blood group (11.70%), 4 patients each with A – ve and O - ve groups (4.26% each), 1 patient was of B -ve blood group (1.06%).Similarly, Sudhakar Rao et al[8] published an article, in which most of cases (22 cases) were of B + ve blood group (36.7%) , while O + ve blood group comprised of 19 cases (31.7 %) ,'A'+ve blood type 12 cases (20%) and '7' cases were of 'AB' + ve blood group (11.66%). However , in contrast to the current study , O+ve blood group (18 cases , 20%) were

found to be the most common among the chronic tonsillitis cases in a study conducted by Al – Ani et al [3], while 11 cases were of A+ve blood group (12.2%) , 9 cases were of B+ve blood group (10%) , 6 cases were of AB+ ve (6.7%) , 2 cases each in 'A'- ve and 'O'- ve blood group (2.2%) , 1 case each in 'AB'- ve and 'B'- ve blood type (1.1%).

RELATIONSHIP BETWEEN CULTURE FINDINGS AND BLOOD GROUPS

Majority of the cultures of B+ve cases grew streptococcal species (14cases ,42.42%) , while majority of the cultures of O+ve and A +ve grew throat commensals comprising 47.6 % (10cases) and 55% (11 cases) respectively showing a significant association between blood groups and culture findings. In contrast to this, a research conducted by Sudhakar Rao et al.[8] showed most of streptococcal throat culture positivity were among the participants of 'O'+ve blood group. Similarly ,in another study conducted by Al-Ani et al [3] majority of chronic tonsillitis caused by beta hemolytic streptococcus was found to be among individuals with blood group O+ve.

CONCLUSION

A persistent infection of the tonsils brought on by several recurrent infections is known as chronic tonsillitis. Chronic inflammation which is long-lasting and show results from multiple episodes of acute tonsillitis or a persistent infection.

The multifactorial etiology of chronic tonsillitis depends on both host and outside factors.The etiological agents can be both bacteriae and viruses. The ignorance about the causative agent can result in improper treatment leading to the development of resistant strains. Moreover bacterial agents belonging to streptococcal species can lead to post infectious sequele like glomerulonephritis or rheumatic fever thus making the need for early diagnosis and treatment necessary. Studying the relationship between blood types & vulnerability to certain diseases can give a better understanding of the condition and the ways to tackle it, making the need for the study necessary.

Current research, shows there is a strong association among culture findings & grade of tonsillar hypertrophy. Also there is a significant association between the blood groups and the throat culture sensitivity findings.

Hence, from the observations in the study, we can conclude that individals of ‘B’ + ve blood groups are more prone for chronic tonsillitis due to streptococcal species. However further studies can be done with a larger sample size and application of other methods like genetic studies as well to get a better understanding about the genes associated with blood groups that determine the vulnerability to certain diseases and also the reason for their chronicity.

SUMMARY

This study was conducted in "KLES Dr.Prabhakar Kore Hospital, Belagavi from a period of one year on patients aged between 3 and 35 years with Chronic tonsillitis attending ENT & HNS outpatient department".

Every patient had a comprehensive clinical examination and history taking. Swabs from the throat were taken and used in the culture test. Their Rh factor and ABO blood classes were also examined.

The results were as follows:-

- Male predominance was observed in our study with the majority falling into the age group of 6-12 and 13 -18.
- Significant association was found between the culture findings and the grade of tonsillar hypertrophy. Grade 3 tonsillar hypertrophy is mainly caused by Streptococcal species.
- Significant association was found between culture findings and blood groups. The majority of cases who took part in our study belonged to B + ve blood group, which is followed by O + ve, and the blood group that has fewest cases was B - ve.
- Among the cases with B+ve blood group, the most common organism isolated was Streptococcal species.

BIBLIOGRAPHY

1. Abegaz SB. Human ABO blood groups and their associations with different diseases. BioMed research international. 2021;2021(1):6629060.
2. Wu S, Hammarstedt-Nordenvall L, Jangard M, Cheng L, Radu SA, Angelidou P, Zha Y, Hamsten M, Engstrand L, Du J, Ternhag A. Tonsillar microbiota: a cross-sectional study of patients with chronic tonsillitis or tonsillar hypertrophy. Msystems. 2021 Apr 27;6(2):10-128.
3. Al-Ani RT. Study of the relationship between blood group and group A Beta-Hemolytic Streptococci isolated from patients with tonsillitis. Iraqi Journal of Science. 2016:855-61.
4. Alrayah M. The Prevalence and Management of Chronic Tonsillitis: Experience From Secondary Care Hospitals in Rabak City, Sudan. Cureus. 2023 Feb;15(2).
5. Kostić M, Ivanov M, Babić SS, Tepavčević Z, Radanović O, Soković M, Ćirić A. Analysis of tonsil tissues from patients diagnosed with chronic tonsillitis—microbiological profile, biofilm-forming capacity and histology. Antibiotics. 2022 Dec 3;11(12):1747.
6. Nave H, Gebert A, Pabst R. Morphology and immunology of the human palatine tonsil. Anatomy and embryology. 2001 Nov;204(5):367-73.
7. Al-Zobaei MA, Al-Khafaji AA, Al-Khalfawi SM. Assessment of some serological tests for diagnosis of tonsillitis caused by b-hemolytic streptococci in Ramadi, Iraq. Egypt J Exp Biol.(Zoo). 2012;8(2):335-40.

8. Apoorva P. Study of blood groups and throat swab culture in chronic tonsillitis among pediatric age group. International Journal of Otorhinolaryngology and Head and Neck Surgery. 2019 Nov;5(6):1512**.**
9. Watkinson J, Clarke R, editors. Scott-Brown's Otorhinolaryngology and Head and Neck Surgery: Volume 2: Paediatrics, The Ear, and Skull Base Surgery. CRC Press; 2018 Jun 12. Page 435
10. C C Chatterjee's Human Physiology .vol 1. 14th edition . page 80
11. Vaz M, Raj T. Guyton & Hall Textbook of Medical Physiology-E-Book: A South Asian Edition. Elsevier Health Sciences; 2013 Jun 3.
12. Ganong WF. Review of medical physiology. Dynamics of blood and lymph flow. 1995;30:525-41.
13. Ganong WF. Review of medical physiology. Dynamics of blood and lymph flow. 1995;30:525-41.
14. Ghai's Textbook of Practical Physiology . 10th edition . page213
15. Brodsky L. Modern assessment of tonsils and adenoids. Pediatric Clinics of North America. 1989 Dec 1;36(6):1551-69.
16. Dhingra PL, Dhingra S. Diseases of Ear, Nose and Throat-eBook. Elsevier Health Sciences; 2017 Oct 7.
17. Kumar B. Histology: Text & Atlas (with Point Access Codes). Wolters kluwer india Pvt Ltd; 2019 Jun 4.
18. Inderbir Sing's Human Embryology . 13th edition . page 413
19. Watkinson J, Clarke R, editors. Scott-Brown's Otorhinolaryngology and Head and Neck Surgery: Volume 2: Paediatrics, The Ear, and Skull Base Surgery. CRC Press; 2018 Jun 12.page 436

20. Al-Khalifawi SM, Al-Khafaji AA, Al-zobaei MA. Molecular study of Beta-Haemolytic Streptococci in Patients with Tonsillitis In Ramadi City. Egyptian Academic Journal of Biological Sciences, G. Microbiology. 2011 Dec 1;3(1):33-9.

21. Zakir Hussain . Otorhinolaryngology . 5th edition . page 516

22. Brodsky L. Modern assessment of tonsils and adenoids. Pediatric Clinics of North America. 1989 Dec 1;36(6):1551-69.

23. Tille P. Bailey & Scott's diagnostic microbiology-E-Book. Elsevier Health Sciences; 2015 Dec 28.

24. Park K. Park's textbook of preventive and social medicine. Preventive Medicine in Obstet, Paediatrics and Geriatrics. 2005.

25. Shulman ST, Bisno AL, Clegg HW, Gerber MA, Kaplan EL, Lee G, Martin JM, Van Beneden C. Clinical practice guideline for the diagnosis and management of group A streptococcal pharyngitis: 2012 update by the Infectious Diseases Society of America. Clinical infectious diseases. 2012 Nov 15;55(10):e86-102.

26. Safak AS, Bulut F, Cumbul A. Histopathological role of vitamin D deficiency in recurrent/chronic tonsillitis pathogenesis: Vascular epithelial growth factor-mediated angiogenesis in tonsil. Clinical and Experimental Dental Research. 2022 Jun;8(3):699-706.

27. Adetayo A, Akinola M, Oladeji M, Oyedele T, Adetayo M, Ladele A. Is there any association between oral hygiene and the development of tonsillitis or tonsillar hyperplasia. Int J Med Sci Clin Invent. 2020 Apr;7(4):4781-7.

28. Mahmoud Elawamry MI, El-Desouky MI, Mohammed TG, Hussien MA, Mohamed MN. Detection of Helicobacter pylori using Giemsa staining in chronic tonsillitis patients: cross-sectional study. The Egyptian Journal of Otolaryngology. 2024 Jan 8;40(1):4.

29. Brook I ,Shah K . Bacteriology of adenoids and tonsils in children with recurrent adenotonsillitis .Ann OtolRhinolLaryngol ,2001 ; 110:844-8.

30. Randolph M F , Gerber M A , De Meo K K , Wright L . Effect of antibiotic therapy on the clinical course of streptococcal pharyngitis .Jpediatr .1985 ; 106:870–5.

31. Rao M S , Abraham T T. A retrospective study of blood groups in head and neck malignancies.J Evid Based Med Health care.2018 ; 5(10):908-12.

32. Mansour A H , Mohammed A M , Anwar R , Elzafrany M E ,Omar N M . ABO blood group and risk of malignancies in egyptians .Internationl Journal of Cancer Research . 2014 ; 10(2):81-95.

33. Gerber M A . Diagnosis of group a beta-haemolytic streptococcal .Jpaediatr. 1998;27:269-73.

34. Morris DP. “Bacterial biofilm in upper respiratory tract infections .Current Infectious Disease Reports .2007 ; 9(3):186-92.

35. AL-Saaid , M .S. 1996 . Aerobic bacterial infection of upper respiratory tract in Babel and study of Genetic regulation of Klebseilla .Ph.D.Thesis , College of Medicine , Baghdad University , Baghdad , Iraq.

36. Bisno , A . L , Gerber M . A ,Gwaltney J. M , Kaplan E. L and Schwartz . R. H. 2002 . Practice guideline for the diagnosis and management of streptococcal pharyngitis . Infectious Diseases Society of America .J.Clin.Infec.Dis.,35,pp:113-115.

37. Kim , S . J .2002 . Epidemiological surveillance of group A streptococci isolated from school children using emm genotyping .Korean J.Lab.Med.,22,pp:417–423.

ANNEXURES

ANNEXURE I:

KAHERs JNMC BELAGAVI

INFORMED CONSENT FORM

"STUDY OF RELATIONSHIP BETWEEN BLOOD GROUPS & THROAT CULTURE SENSITIVITY FINDINGS IN CHRONIC TONSILLITIS PATIENTS, A ONE YEAR OBSERVATIONAL STUDY IN A TERTIARY CARE CENTRE"

Name of Student / Principal Investigator : Dr ADARSH E JAYAPRAKASH

Name of Guide / Co Investigators : Dr B P BELALDAVAR

Objective: To find out the relationship between blood groups and throat culture sensitivity findings in patients with chronic tonsillitis.

INTRODUCTION AND PURPOSE:

The present study is conducted among patients with vitiligo attending the out-patient department of Dermatology and referred to ENT & HNS in KLE's Dr. Prabhakar Kore Charitable Hospital and Medical Research Centre, Belagavi and will be investigated for throat swab culture and blood group typing

PROCEDURE:

Patients showing symptoms of chronic tonsillitis are identified and a throat swab is collected and sent for culture and sensitivity along with a blood sample for blood grouping.

WITHDRAWAL FROM PARTICIPATION IN THE STUDY:

Participation in this study is voluntary.You will be free to decide whether to participate in this study or continue participation once enrolled. In case you decide to withdraw your participation, you are free to do so. However, please convey the decision to the principal investigator.

POSSIBLE BENEFITS FROM PARTICIPATING IN THE STUDY:

You will/will not have nor get any benefits by participating in this study. The data gathered will help the population at large.

POSSIBLE RISKS FROM PARTICIPATING IN THE STUDY: There are no risks involved in participating in this study.

PRIVACY AND CONFIDENTIALITY: The information collected from you will be coded, to prevent any person from identifying you. Your identity will never be revealed. The data collected from you will be kept confidential and only processed or aggregated data will be used for publication.

FINANCIAL INCENTIVES:

You will not receive any payment for participating in this study.

AUTHORIZATION FOR PUBLICATION OF AGGREGATED DATA :

Results obtained after processing of the aggregated data will be published for scientific purposes and or presented to scientific groups. However, your identity will never be revealed.

QUERIES AND CONTACT:

If you have any question or complaints with regard to your right as study participant you may contact Dr. Harsha Hegde, Chairperson, Ethical committee of JNMC, 0831-2473777 Extension 4052.

Legal rights: By signing this consent form, we are not waving any of your legal rights.

INFORMED CONSENT FORM

Informed Assent Form for Children / Minors (age 13 to 18)

Name of Principle Investigator :Dr. Adarsh E Jayaprakash

Project title : Relationship between blood groups and throat culture sensitivity findings in patients with chronic tonsillitis , a one year cross sectional study in a tertiary care centre

Name of guide : Dr B P BELALDAVAR

My name is Dr. Adarsh E Jayaprakash and my job is to find out the relationship between blood groups and throat culture sensitivity findings in patients with chronic tonsillitis.

I am going to give you information and invite you to be part of a research study. You can choose whether or not you want to participate. We have discussed this research with your parent(s)/guardian and they know that we are also asking you for your agreement .If you are going to participate in the research, your parent(s)/guardian also have to agree .But if you do not wish to take part in the research, you do not have to, even if your parents have agreed.

You may discuss anything in this form with your parents or friends or anyone else you feel comfortable talking to. You can decide whether to participate or not after you have talked it over. You do not have to decide immediately.

There may be some words you don't understand or things that you want me to explain more about because you are interested or concerned. Please ask me to stop at anytime and I will take time to explain.

Purpose: we want to find out the relationship between blood groups and throat culture sensitivity findings in patients with chronic tonsillitis.

Participation is voluntary: you don't have to be in this research if you don't want to be. It's up to you. If you decide not to be in the research, its okay. Even if you say yes now, you can change your mind later and it's okay.

I have checked with the child and they understand that participation is voluntary

Risks:-There are absolutely no risks involved at any point of time.

Discomfort:-The procedure of throat swab might cause some discomfort while probing, however you will be fine within few minutes

I have checked with the child and they understand and they understand the discomforts involved

Benefits:-There are no monetary benefits involved in the study. If the study is successful in proving the relationship between throat swab culture findings and blood groups then it will be beneficial for the treatment.

I have checked with the child and they understand the benefits.

Confidentiality: Information about you that will be collected from the research will be put away and no-one but the researchers will be able to see it. Any information about you will have a number on it instead of your name. Only the researchers will know what your number is and we will lock that information up with a lock and key. It will not be shared with or given to anyone except [name who will have access to the information, such as research sponsors, DSMB board, your clinician, etc].)

Right to Refuse or Withdraw: You do not have to be in this research. No one will be mad or disappointed with you if you say no. It's your choice. You can think about it and tell us later if you want. You can say "yes" now and change your mind later and it will still be okay.

Who to Contact:

You can ask me questions now or later. You can ask the nurse questions. I have written a number and address where you can reach us or, if you are nearby, you can come and see us.

If you choose to be part of this research I will also give you a copy of this paper to keep for yourself. You can ask your parents to look after it if you want.

CERTIFICATE OF ASSENT

I understand that the research is about finding the relationship between throat culture sensitivity findings and blood groups in chronic tonsillitis patients.

I have read this information (or have the information read to me). I have had my questions answered and know that I can ask questions later if I have them.

I agree to take part in this research

OR

I do not wish to take part in the research and I have not signed the assent below._____(initialled by child or minor)

<u>Only if child assents:</u>

Name of child: _____

Signature of child: _____

Date: _____

If illiterate:

I have witnessed the accurate reading of the assent form to the child, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of witness _____ and Thumb print of participant

_____.

Signature of witness _____

Date _____

I have witnessed the accurate reading of the assent form to the child , and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Name of researcher: Dr. Adarsh E Jayaprakash

Signature of researcher : _____

Date : _____

Statement by the researcher / person taking consent

I have accurately read out the information sheet to the potential participant and to the best of my ability made sure that the child understands the same.

I confirm that the child was given an opportunity to ask questions about the study, and all the questions asked by him/her have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

Name or Reasearcher / person taking assent :DrAdarsh E Jayaprakash

Signature of Researcher / person taking the assent _____

Date : _____

Copy provided to the participant _____(initialled by researcher / assisstant)

Parent / guardian has signed an informed assent , yes ____ no ____ (initialled by researcher or assistant)

VERBAL ASSENT STATEMENT for Children / Minors (age 7 - 12)

Project title : Relationship between blood groups and throat culture sensitivity findings in patients with chronic tonsillitis , a one year cross sectional study in a tertiary care centre

Name of Principle Investigator :DrAdarsh E Jayaprakash

Name of guide : Dr B P BELALDAVAR

Hello, I am Dr. Adarsh E Jayaprakash. I am doing a study to learn the relationship between blood groups and throat culture sensitivity findings in patients with chronic tonsillitis. If you agree to be in our study, we will ask you to cooperate with us. What we learn in this research may help others with chronic tonsilliti . You may ask us questions at any time

Do you understand what I am saying and are you willing to go ?

TO BE COMPLETED BY PERSON OBTAINING VERBAL ASSENT FROM THE CHILD:

Childs response: **yes _____** **no _____**

CHECK WHICH APPLIES BELOW:

____ The child is capable of understanding the study

____ The child is not capable of understanding the study

Childs Name:_____

Name and Signature of Person obtaining consent :_____

Date :

Name and Signature of the student/principal investigator :

Signature of the guide: **Date:**

ANNEXURE II:

PROFORMA

"STUDY OF RELATIONSHIP BETWEEN BLOOD GROUPS AND THROAT CULTURE SENSITIVITY FINDINGS IN PATIENTS WITH CHRONIC TONSILLITIS, A ONE YEAR CROSS SECTIONAL STUDY IN A TERTIARY CARE CENTRE"

Date: I.P. No:

Name: Occupation:

Age: Phone No:

Sex:

Address:

CLINICAL PROFILE:

Chief Complaint:

History of Present Illness:

Past History:

Personal History:

Family History:

I) General Physical Examination -

Blood Pressure:

Pulse:

Respiratory Rate:

Pallor

Icterus

Clubbing

Cyanosis

Lymphadenopathy

Oedema

II) ENT Examination

1. **EAR EXAMINATION:**

	Right	Left
Pinna		
Pre auricular area		
Post auricular area		
Tragal Tenderness		
Mastoid Tenderness		
External auditory canal		
Tympanic membrane		

TUNING FORK TESTS:

Rinne's test: 256 Hz

512 Hz

1024 Hz

Weber's test:

Absolute Bone Conduction test

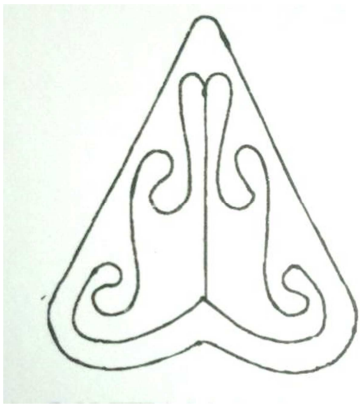
2. NOSE EXAMINATION:

External appearance:

- Root
- Bridge
- Dorsum
- Alae
- Tip
- Columella

Cold spatula test:

Anterior Rhinoscopy:



Posterior Rhinoscopy:

Paranasal Sinus Examination :

	Right	Left
Frontal Sinus		
Ethmoidal Sinuses		
Maxillary Sinus		

3. THROAT EXAMINATION:

Oral cavity:

- Lips
- Labial and buccal mucosa
- Gingivolabial and gingivobuccal sulci
- Gingiva
- Teeth
- Hard palate
- Floor of mouth
- Anterior 2/3rd of tongue
- Retromolar trigone

Oropharynx:

- Soft palate
- Uvula
- Anterior pillar
- Tonsills
- Posterior pillar
- Posterior and lateral pharyngeal wall

Indirect Laryngoscopy

4. NECK EXAMINATION:

5. THROAT CULTURE SENSITIVITY RESULTS

Culture Report:

Accession No:

Ip/Op no:

Sample collection date:

Report date:

6. BLOOD GROUP AND MATCHING RESULTS

ANNEXURE – III

MASTER CHART:

SL NO	NAME	AGE	SEX	OCCUPATION	STATE/PART OF INDIA	GRADE OF TONSILLAR HYPERTROPHY	CULTURE FINDINGS	BLOOD GROUP
1	AKSHATA BEERAPPA PATIL	12	F	STUDENT	BELGAUM/KARNATAKA	III	THROAT COMMENSALS	A +VE
2	ANIL KUMAR ULLAGADDI	12	M	STUDENT	BELGAUM/KARNATAKA	II	STREPTOCOCCAL SPECIES	O -VE
3	PANKAJ MAHANTESH RATHOD	6	M	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	O +VE
4	HARSHA NEELAKANT HANJI	7	F	STUDENT	BELGAUM/KARNATAKA	III	PSEUDOMONAS AERUGINOSA	B+VE
5	GANESH HANAMANA GOWDA	15	M	STUDENT	BELGAUM/KARNATAKA	II	NO ORGANISM	AB +VE
6	MUSA SHAIK	8	M	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	O +VE
7	SAMARTH AIHOLE	28	M	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	A +VE
8	AJEET GADAD	16	M	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	B+VE
9	SHILPA GADAD	13	F	STUDENT	BELGAUM/KARNATAKA	II	KLEBSIELLA PNEUMONIA	A +VE
10	AMBIKA RAVINDRA MARDI	10	F	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	A +VE
11	SAVITRI BAGATI	19	F	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	B+VE
12	SHREYA NANDI	12	F	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	A+VE
13	PRADEEP IRAPPA KADAKOL	10	M	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	O+VE
14	MADAN PALLED	8	M	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	B+VE
15	KARTHIK HITTALAMANI	9	M	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	O-VE
16	SHREYA ITAGI	12	F	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	O+VE
17	SUMIT SHINGE	14	F	STUDENT	BELGAUM/KARNATAKA	II	NO ORGANISM	O+VE
18	BALAKRISHNA BORANNAVAR	6	M	STUDENT	BELGAUM/KARNATAKA	III	THROAT COMMENSALS	O+VE
19	VINOD PANI	19	M	STUDENT	BELGAUM/KARNATAKA	III	THROAT COMMENSALS	B+VE
20	ILIYAS M SHAREEF	27	M	SHOPKEEPER	BELGAUM/KARNATAKA	II	KLEBSIELLA PNEUMONIA	B+VE
21	YASHODA RATHOD	16	F	STUDENT	BELGAUM/KARNATAKA	III	PSEUDOMONAS AERUGINOSA	B+VE
22	SHANKAR ARJUN	36	M	SHOPKEEPER	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	A+VE
23	SUVARNA	34	F	HOUSEWIFE	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	A+VE
24	KEMPAVVA	30	F	HOUSEWIFE	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	A+VE
25	THEJU	21	M	FARMER	BELGAUM/KARNATAKA	II	PSEUDOMONAS AERUGINOSA	O+VE
26	NEELAVVA GANACHARI	35	F	HOUSEWIFE	BELGAUM/KARNATAKA	III	PSEUDOMONAS AERUGINOSA	B+VE
27	AKASH INCHAL	19	M	STUDENT	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	O+VE
28	CHANDAN RAI	30	M	TEACHER	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	A+VE
29	VINOD	19	M	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	B+VE
30	MADHU MEDAR	10	F	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	A+VE
31	KHUSHI BHAGALKOT	6	F	STUDENT	BELGAUM/KARNATAKA	III	PSEUDOMONAS AERUGINOSA	A+VE
32	CHETAN KALARAPPAGOL	22	M	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	AB +VE

33	KHUSHI NAIK	10	F	STUDENT	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	A+VE
34	LATA	17	F	STUDENT	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	B+VE
35	IMAM H MULLA	35	M	BUSSINESS	BELGAUM/KARNATAKA	II	PSEUDOMONAS AERUGINOSA	AB +VE
36	PAVAN KUMAR	14	M	STUDENT	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	B+VE
37	ROHIT	11	M	STUDENT	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	B+VE
38	RAMESH	13	M	STUDENT	BELGAUM/KARNATAKA	II	STREPTOCOCCAL SPECIES	B+VE
39	LAXMI	10	F	STUDENT	BELGAUM/KARNATAKA	III	CONS	O+VE
40	BHARATI	15	F	STUDENT	BELGAUM/KARNATAKA	II	STREPTOCOCCAL SPECIES	AB+VE
41	SALMA	9	F	STUDENT	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	A-VE
42	AAROHI	11	F	STUDENT	BELGAUM/KARNATAKA	III	KLEBSIELLA PNEUMONIA	O-VE
43	MOHAMMED	15	M	STUDENT	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	B+VE
44	MAHANANDA	13	F	STUDENT	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	O+VE
45	ANUSHRI	19	F	STUDENT	BELGAUM/KARNATAKA	III	CONS	B+VE
46	SHIVAKUMAR	25	M	SHOPKEEPER	BELGAUM/KARNATAKA	II	MRSA	A+VE
47	DESAI DASTAGIR	30	M	BUSSINESS	BELGAUM/KARNATAKA	II	MRSA	AB +VE
48	SUBASH	28	M	BUSSINESS	BELGAUM/KARNATAKA	II	MRSA	B+VE
49	ABEDA	32	F	HOUSEWIFE	BELGAUM/KARNATAKA	II	STAPHYLOCOCCU AUREUS	B+VE
50	AFREEN	29	F	HOUSEWIFE	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	O+VE
51	SAMMED	17	M	STUDENT	BELGAUM/KARNATAKA	II	STREPTOCOCCAL SPECIES	B+VE
52	VINOD YALLAPPA	28	M	STUDENT	BELGAUM/KARNATAKA	II	KLEBSIELLA PNEUMONIA	A -VE
53	MUSAMMIL	28	M	BUSSINESS	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	A-VE
54	ZIYAAN	9	M	STUDENT	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	O-VE
55	NAGARATNA	35	F	HOUSEWIFE	BELGAUM/KARNATAKA	II	PSEUDOMONAS AERUGINOSA	AB +VE
56	BURANODDIN	13	M	STUDENT	BELGAUM/KARNATAKA	II	PSEUDOMONAS AERUGINOSA	B+VE
57	NEELAVVA	33	F	HOUSEWIFE	BELGAUM/KARNATAKA	II	KLEBSIELLA PNEUMONIAE	B-VE
58	RAYAGOUDA	35	M	FARMER	BELGAUM/KARNATAKA	II	PSEUDOMONAS AERUGINOSA	B+VE
59	NAGAMMA	35	F	HOUSEWIFE	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	A-VE
60	GANGAVVA	34	F	HOUSEWIFE	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	O+VE
61	SIDAPPA	32	M	FARMER	BELGAUM/KARNATAKA	II	ENTEROBACTER CLOACEAE	O+VE
62	SUMANGALA SAGAR	14	F	HOUSEWIFE	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	A+VE
63	BASANGOWDA	35	M	BUSSINESS	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	B+VE
64	KRISHNA	32	M	GOVT EMPLOYEE	BELGAUM/KARNATAKA	II	CONS	B+VE
65	POORNIMA KARANDE	12	F	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	O+VE
66	AMRUTA	14	F	STUDENT	BELGAUM/KARNATAKA	II	CONS	B+VE
67	SARIKA	18	F	STUDENT	BELGAUM/KARNATAKA	II	PSEUDOMONAS AERUGINOSA	AB+VE
68	ROOPA	19	F	STUDENT	BELGAUM/KARNATAKA	II	STAPHYLOCOCCUS AUREUS	A+VE
69	MALLAVVA	34	F	HOUSEWIFE	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	A+VE
70	AISHWARYA	9	F	STUDENT	BELGAUM/KARNATAKA	III	KLEBSIELLA PNEUMONIAE	B+VE

71	YASH BORASHETTI	8	M	STUDENT	BELGAUM/KARNATAKA	II	KLEBSIELLA PNEUMONIAE	AB +VE
72	ANNAVVA	25	F	STUDENT	BELGAUM/KARNATAKA	II	KLEBSIELLA PNEUMONIAE	A+VE
73	AKSHATA	10	F	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	O+VE
74	KAPIL	23	M	STUDENT	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	O+VE
75	REVATI	30	F	HOUSEWIFE	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	AB +VE
76	ASHWIK	9	M	STUDENT	BELGAUM/KARNATAKA	II	THROAT COMMENSALS	A+VE
77	NASH	15	M	STUDENT	BELGAUM/KARNATAKA	II	STREPTOCOCCAL SPECIES	O+VE
78	MANASI PATIL	35	F	HOUSEWIFE	BELGAUM/KARNATAKA	II	STREPTOCOCCAL SPECIES	B+VE
79	NARASIMHA	35	M	BUSSINESS	BELGAUM/KARNATAKA	II	ENTEROBACTER SPECIES	AB+VE
80	AASHI	22	F	STUDENT	BELGAUM/KARNATAKA	II	CONS	O+VE
81	SOUMYA NAIK	14	F	STUDENT	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	B+VE
82	ROHAN SHRIKANT	21	M	STUDENT	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	B+VE
83	KARTHIK	16	M	STUDENT	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	B+VE
84	DYAMAPPA	32	M	FARMER	BELGAUM/KARNATAKA	II	STREPTOCOCCAL SPECIES	B+VE
85	MADIVALAPPA	33	M	FARMER	BELGAUM/KARNATAKA	II	PSEUDOMONAS AERUGINOSA	O+VE
86	SAAD SAYED	15	M	STUDENT	BELGAUM/KARNATAKA	III	THROAT COMMENSALS	O+VE
87	AFZAL	12	M	STUDENT	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	B+VE
88	PRABHITA	13	F	STUDENT	BELGAUM/KARNATAKA	II	STREPTOCOCCAL SPECIES	B+VE
89	SHIVARAJ	16	M	STUDENT	BELGAUM/KARNATAKA	III	STREPTOCOCCAL SPECIES	B+VE
90	SUNANDA	22	M	STUDENT	BELGAUM/KARNATAKA	II	STAPHYLOCOCCUS AUREUS	O+VE
91	KALLAPPA	28	M	STUDENT	BELGAUM/KARNATAKA	II	CONS	AB+VE
92	AHMED	13	M	STUDENT	BELGAUM/KARNATAKA	III	PSEUDOMONAS AERUGINOSA	A+VE
93	YUVRAJ	11	M	STUDENT	BELGAUM/KARNATAKA	II	ENTEROBACTER CLOACEAE	A-VE
94	PREMA	32	M	STUDENT	BELGAUM/KARNATAKA	II	NO ORGANISM	B+VE