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A STUDY OF HEARING IMPROVEMENT AFTER TYMPANOPLASTY IN PATIENTS OF CSOM

1. Dr.Sowjanya
Assistant Professor of ENT,
Viswabharathi Medical College,
R.T.Nagar, Near Penchikalapadu, Kurnool
Ph.no:9182034859 mail-id:sowjanyaentkmc@gmail.com

2. Dr. Shashi Kiran Somala,
Assistant Professor of ENT,
Viswabharathi Medical College,
R.T.Nagar, Near Penchikalapadu, Kurnool
Ph.no:8123402891 mail-id:shashikiran.14@gmail.com

3. Dr.Subin. V.
Associate Professor of ENT,
Viswabharathi Medical College,
R.T.Nagar, Near Penchikalapadu, Kurnool
Ph.no:9491407413 mail-id:nibusv@yahoo.com

4. Dr.B.V.Surendra,
Assistant Professor of Physiology,
Viswabharathi Medical College,
R.T.Nagar, Near Penchikalapadu, Kurnool
Ph.no:8977114065 mail-id:drsurendraphysiology@gmail.com

Corresponding authors:
Dr.B.V.Surendra,
Assistant Professor of Physiology,
Viswabharathi Medical College,
R.T.Nagar, Near Penchikalapadu, Kurnool
Ph.no:8977114065 mail-id:drsurendraphysiology@gmail.com

ABSTRACT:

Introduction: Chronic suppurative otitis media (CSOM) is one of the most frequent ear illnesses and one of the primary causes of hearing loss. The current study was designed to evaluate the improvement in hearing after tympanoplasty in CSOM patients who presented to a tertiary care teaching hospital.

MaterialsAnd Methods: The current study was a prospective observational study that took place in the department of ENT at Viswarabharathi Medical College and General Hospital from March 2019 to February 2020. The study included 50 individuals who were clinically diagnosed with chronic suppurative otitis media Tubotympanic type illness. Pre-operatively, pure tone audiometry was performed, and hearing loss and the mean AB Gap were recorded. Tympanoplasty type 1 was done with or without mastoidectomy. After 6 weeks, all of these patients were followed up on and Pure tone audiometry was done. The outcomes of hearing loss and mean AB Gap were compared to pre-operative data.

Results: In the current study, out of 50 patients, male participants were 21(42%) and female participants were 29 (58%).The majority of the study population were between 20 to 60 years. Out of 50 subjects, 9(18%) had small central perforation, 23 (46%) participants had medium central and 18 (36%) participants had large central perforation. The mean pre-andpostoperative outcomes in terms of Pure tone audiometry ($p<0.05$) and Air-bone gap ($p<0.05$) were significant.

Conclusion: In our study, the post-operative Mean AB Gap was substantially improved as compared to the pre-operative Mean AB Gap. Timely treatment of CSOM with tympanoplasty can have a considerable favourable influence on the affected individual's hearing condition, which in turn can have a good impact on recurring infection rates and the individual's quality of life.

Key Word: CSOM, Hearing Improvement, Tympanoplasty, AB Gap

Introduction:

Chronic otitis media (COM), a frequent otorhinolaryngology problem, is characterised by an inflammatory process of the mucoperiosteal lining of the middle ear cavity and mastoid, with chronic, recurrent, or persistent discharge via a perforated tympanic membrane [1]. Chronic Suppurative Otitis Media is classified into two types: Tubotympanic (safe or mucosal) and Atticoantral (unsafe or squamosal) [3].

Chronic TubotympanicSuppurative otitis media can be treated in two ways: conservatively or surgically. The goal of middle ear surgery is to reduce the patient's hearing loss rather than just to close the air bone gap. Small perforations generally heal on their own, but when the borders of the perforation are covered by stratified squamous epithelium, the perforation becomes persistent and does not heal on its own [4].

Tympanoplasty, with or without mastoidectomy, is indicated for chronic ear disease processes such as tympanic membrane perforation due to previous middle ear infections, tympanic membrane atelectasis, retraction pocket, cholesteatomas, tympanosclerosis, and chronic otitis media with effusion or mastoid granuloma. [5] Conductive hearing loss caused by ossicular chain anomalies can result from either ossicular chain discontinuity or fixation. Ossiculoplasty is a surgical procedure used to repair or rebuild the ossicular chain. Ossiculoplasty is necessary in 40% to 90% of all tympanoplasties. [6]

The purpose of tympanoplasty is to restore sound pressure transformation at the oval window by connecting an intact tympanic membrane to a movable stapes footplate via an intact or reconstructed ossicular chain and to protect the round window membrane with a closed, air-containing, and mucosa-lined middle ear. [7]

In the present prospective comparative study, we analyzed the hearing improvement in patients of CSOM after tympanoplasty by pre-operative and postoperative audiometric evaluation

MATERIALS AND METHODS :

The present study was a prospective study conducted in the department of E. N. T, Viswabharathi Medical College & General Hospital, Kurnool for a period of 1 year commencing from March 2019 to February 2020. The study included 50 patientsof Chronic Suppurative Otitis Media Tubotympanic Type Disease between the age group of 10 years and

60 years of both sexes. Subjects were included and excluded according to the following criteria:

Inclusion criteria

1. Patients with chronic otitis media of the inactive mucosal kind.
2. Patients with conductive hearing loss.
3. In the age group of 10 years to 60 years.

Exclusion cases:

1.All ASOM

2. Congenital hearing disorder

3.Patients with chronic otitis media of the Atticoantral or Squamosal form, as well as sequelae.

4. Patient having mixed/ Sensorineural hearing loss, drug history.
5. Age less than 10 years and more than 60 years.
6. Patients with both subtotal and complete perforation.
7. Previous ear surgery or trauma history

A thorough clinical examination and history were performed. Pre-operatively, pure tone audiometry was performed, and hearing loss and the mean AB Gap were recorded. A type 1 tympanoplastywas done. All of these patients were followed up on 6 weeks after surgery. Pure tone audiometry was carried out. The outcomes of hearing loss and mean AB Gap were compared to pre-operative data.

Investigations: Pure tone audiometry was then performed on the patients. The Arphy -2001 Audiometer was used for pure tone audiometry. The experiment was carried out in an acoustically treated environment. Air and bone conduction were both examined. The 5 up & 10 down approach was used to calculate the threshold frequency. The degree of deafness was graded using the WHO classification.1980: 0 to 25 dB – Normal hearing 26 to 40dB – Mild deafness 41 to 55 dB– Moderate deafness 56 to 70 dB– Moderately Severe deafness 71 to 90 dB– Severe deafness >90 dB– Profound deafness

Statistical Analysis

The SPSS version 16 software was used to conduct the analysis. Percentages, averages, and standard deviations were all computed using descriptive statistics. The difference was compared using a paired T-test. The significance threshold was chosen at $P<0.05$.

Results:

1. Age distribution of patients

   Among the study population, 21(42%) participants were aged between10 to 20 years, 26 (52%) were aged 20 to 40 years, 03 (6%) were aged 40 to 60 years.

   Table 1: Age distribution of patients

Age group (in years)	Number of patients	Percentage (%)
10-20	21	42
20-40	26	52
40-60	03	6

2. Gender distribution of patients
   Among the study population male participants were 21 (42%) and remaining 29 (58%) were female participants
   Table 2: Gender distribution of patients

Sex	Number of patients	Percentage (%)
Male	21	42
Female	29	58
Total	50	100

3. Types of perforation in the study population
   In our study, the most common type of perforation encountered was medium central perforation being about, followed by large central perforation, and small central perforation

   Table 3: Types of perforation

Perforation	Frequency	Percentage (%)
Small central	9	18
Medium central	23	46
Large central	18	36

4. Comparison of pre and post-operativeoutcomes.
   In our study, There was a significant difference in PTA and ABG in preoperative and postoperative outcomes.

Operative	PTA	Air-bone gap
Preoperative	40.32± 9.70	26.24 ± 8.08
Postoperative	31.41 ± 8.75	16.33 ± 5.72
P-Value	0.03 (Sig.)	0.02 (Sig.)

Discussion:

In this study, 50 patients with chronic otitis media between the ages of 10 and 60 were evaluated for postoperative improvement in hearing after Tympanoplasty.The age group of 20-40 years (52 percent) had the highest number of patients, 39, which is comparable to the study done by Jain K et al [8], in which the age group varied from 15 to 40 years. A large number of patients were observed in the age group of 20-40 years in a research done by Dr.V.P.Narve et al [9]. The study by Latoo et al [10] found that the majority of patients were between the ages of 20 and 29. The most typically affected age group, according to Varshney S et al [11], was 16-25 years.

Females outnumbered their male counterparts in our study. This was shown to be consistent with a prior study conducted by Shaikh et al. [12]

In our study, the most prevalent form of perforation was a medium central perforation in 46% of cases, followed by big central perforation in 36% of cases. Sharma et al. [13] found that the most prevalent form of perforation was central, with a 69.77 percent frequency. In their 203-person research sample, Kamal et al [14] found a 93 percent frequency of central perforation in COM.

After comparing pre-and post-operative AB Gap data, we noticed that the post-operative mean AB Gap closure was 16.33 5.72.dB in our study The P-value was 0.05, which was significant. The postoperative mean air-bone gap was 11.60+/-7.70dB in a study done by Gaurav Batni and Goyal R [15]. The postoperative mean air-bone gap was 21.18dB with a p-value of 0.001 in a study done by KripaDangol and Rakesh Prakash Shrivastav [16].

Conclusion:

In our study, the post-operative Mean AB Gap was improved significantly as compared to the pre-operative mean AB Gap. As a result, this study revealed that Tympanoplasty is a helpful operation for hearing improvement and illness elimination. Timely treatment of CSOM with tympanoplasty can have a considerable favorable influence on the affected individual's hearing status, which in turn can have a good impact on recurrent infection rates and the individual's quality of life.

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