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Middle Ear Risk Index (Meri) As a Prognostic Factor in Tympanoplasty in Chronic Otitis Media

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KEYWORDS tympanoplasty, meri score, chronic otitis media.	ABSTRACT: INTRODUCTION			
	Otitis media is an important and a highly prevalent disease of the middle ear and poses health problem world wide especially in developing countries where large percentage of the population lack specialized medical care. With a large number of patients frequently undergoing tympanoplasty for tubotympanic type of COM, it's important to assess the severity of the disease and predict the outcome of the surgical management whenever done.			
	MERI score is a prognostic tool to predict the outcome of tympanoplasty. It has an inverse relation with graft uptake and hearing benefit.			
	OBJECTIVES			
	• To assess the	ne MERI score and tympanoplasty ou	tcomes in cases of mild disease (1-3).	
	• To evaluate the surgical outcome of tubotympanic type of chronic otitis media and its relationship to the MERI.			
	MATERIALS & M	IETHODS		
	A prospective study was done where, 50 patients with chronic suppurative otitis media – mucosal type, with conductive hearing loss were included in this study for a period of 8 months. All the patients had a score of 1-3 which is the mild category according to MERI SCORE. The age range of patients was from 20 to 45 years.			
	Patients with sensorineural hearing loss, or hearing loss due to other causes were excluded,			
	Patients having other comorbidities like diabetes mellitus, hypertension, bronchial asthma, or thyroid disorders were excluded.			
	Routine blood inve perforation features audiometry was do	stigations was done for all patients. O s in terms of size and site was noted.	toscopic findings of tympanic membrane Pure tone vent tympanoplasty surgery under general	

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anesthesia. In this study, the underlay technique was used for surgery and temporalis fascia was
used as graft material in all patients. The patient was evaluated postoperatively clinically in 2nd
week and after 1-month, 3rd month follow-up visit pure tone audiometry was repeated
RESULT: Patients with a mild score of 1-3 according to the middle ear risk index was seen to have significant improvement in hearing post-operatively.
CONCLUSION: MERI score is a useful tool for accessing the success rate of tympanoplasty.

INTRODUCTION

Chronic otitis media (COM) is a condition characterized by inflammation of the middle ear and mastoid cavity, which can cause recurrent discharge from the ear through an existing perforation in the tympanic membrane. This health issue is prevalent worldwide, with an estimated 65 to 330 million cases occurring each year.

There are two primary types of chronic suppurative otitis media (CSOM): mucosal and squamosal. The mucosal type is characterized by a central perforation, often with or without an active ear discharge that involves the middle ear ossicles. In contrast, the squamosal type presents with a marginal or attic perforation and the presence of cholesteatoma.

Mucosal type is generally treated with aural toilet and antibiotics, followed by surgical intervention in the form

of tympanoplasty or myringoplasty. Tympanoplasty is the most common surgical procedure used to remove infection and restore the function of the middle ear. The goal of the procedure is to eliminate the disease from the middle ear and reconstruct the hearing mechanism, either with or without the use of a tympanic membrane graft.

As otitis media is prevalent and tympanoplasty is often needed, it is crucial to assess the severity of the disease and predict the success of the surgery. Kartush¹ introduced the Middle Ear Risk Index System in 1994 to achieve this goal.

"MERI is a proposed indicator for evaluating and forecasting the outcome of tympanoplasty, which takes into account seven risk variables, such as smoking, otorrhea, perforation, cholesteatoma, ossicular status, and prior surgery in the same ear."².

OTOLOGIC FACTOR	MAXIMUM SCORE
Otorrhea	3
Perforation	1
Cholesteatoma	2
Ossicular status	4
Middle ear granulation	2
Previous surgery	2
Smoking	2

MIDDLE EAR RISK INDEX SCORE:

Depending on Scoring done for each factor and patients are grouped into 3 categories based on the total score

A. mild disease (1-3)

B. moderate disease (4-6)

C. severe disease (7-12)

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The study's objectives are to assess the MERI score and tympanoplasty outcomes as per risk category in cases of mild disease (1-3) and to evaluate the surgical outcome of tubotympanic type of chronic suppurative otitis media and its relationship to the MERI.

MATERIALS AND METHODS

A prospective study was done where, 50 patients with chronic otitis media – mucosal type, with conductive hearing loss were included in this study for a period of 8 months. All the patients had a score of 1-3 which is the mild category according to MERI SCORE. The age range of patients was from 20 to 45 years.

Patients with sensorineural hearing loss, or hearing loss due to other causes were excluded,

Patients having other comorbidities like diabetes mellitus, hypertension, bronchial asthma, or MERI is intended to evaluate and anticipate the results of tympanoplasty. It assesses the risk of middle ear complications by considering seven variables, such as smoking history, presence of otorrhea, perforation, cholesteatoma, ossicular status, and prior surgery on the same ear.thyroid disorders were excluded.

Routine blood investigations was done for all patients. Otoscopic findings of tympanic membrane perforation features in terms of size and site was noted. Pure tone audiometry was done preoperatively. All patients underwent tympanoplasty surgery under general anesthesia. In this study, the underlay technique was used for surgery and temporalis fascia was used as graft material in all patients. The patient was evaluated postoperatively clinically in 2nd week, and after 1month, and 3rd month follow-up visit pure tone audiometry was repeated.

RESULT

In this study, 50 people were classified as mild risk (MERI 1-3). Participants in this research varied in age from 20 to 45. 20 participants were males (40%), whereas 30 patients were females (60%). No patients had history of any comorbidities. (Fig.2)

According to the otoscopy findings, 29 individuals had dry ears, whereas 21 occasionally had wet ears. All individuals had a medium-sized tympanic membrane perforation. In the middle ear/external auditory canal, granulations were present in 17 of 50 people. Out of 50 patients, 42 had normal ossicular chain status, and 8 had an incus defect. Four patients out of 50 had a history of smoking. None of the individuals previously had cholesteatoma or history of ear surgery in the same ear. (Fig 3,4,5,6)

The following diagram (Fig.1) illustrates pure tone audiometry's results: - Prior to surgery, the average hearing loss was 40 dB; after surgery, it was 30 dB. An average 10 dB improvement in the hearing was seen in this study.

On clinically evaluating the patients in the 2nd week and 1 month follow up postoperatively graft uptake was also checked which showed 90% had graft was taken up successfully .(Fig 7)

P value of this study was <0.0005 showing significant improvement of hearing in mild disease according to MERI Score on an average of 10db.



Fig 1

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Fig 7

DISCUSSION:

The preferred therapy for chronic otitis media is tympanoplasty. Numerous variables, including a small eustachian tube, inadequate ventilation, and repeated upper respiratory tract infection, might influence the surgery's success.^{3,4}

Analysis of 50 patients with mild MERI scores (1-3) of tubotympanic type of chronic otitis media revealed the results mentioned above. In this study, the majority of patients belong to age group of 30-35 years (40%) with male to female ratio of 2:3. Ear discharge (on & off) is the most prevalent symptom of presentation. Pure tone audiometry is done for all patients showing results:-before surgery, the average hearing loss was 40dB whereas, after surgery, it was 30dB. An average 10dB improvement in the hearing was seen in this study. In the study conducted by Sevim Aslan Felek et al.,¹⁰ they also found a statistically significant difference between the mean hearing gain in the mild MERI group compared to the severe category of MERI.

On following up patient postoperatively, majority of patients, 90 percent had a successful graft uptake. These results were similar to the study conducted by Nishant Kumar et al.¹¹ in which there was 86 percent graft uptake rate in mild MERI score category.

Age restrictions shouldn't absolutely preclude ossicular reconstruction. Although hearing aids may provide a noninvasive method to manage hearing loss in pediatric patients. The success rate of tympanoplasty is significantly impacted by the development of the eustachian tube. Although it is not totally obvious what age is ideal, a meta-analysis of these publications clearly shows that tympanoplasty has a high success rate as patients get older.⁵

In previous studies, Ozbek et al. and Cavir et al. found that different tympanoplasty graft techniques yield good anatomic and functional results ^{3,6}. Shishegar et al. and Pinar et al. showed that there was a correlation between MERI needed to control disease and surgical success.⁷⁻⁸ Some otolaryngologists believe that dry ear has little bearing on graft success but majority think it is essential. Patients who had a dry ear for three months prior to surgery, had shown much greater rate of graft absorption.⁹

CONCLUSION

Mild MERI was found to be a protective factor against surgical failure. Therefore, presurgical MERI may be a useful tool to determine if patients are candidates for tympanoplasty or if more aggressive interventions, or if medical treatment before tympanoplasty is necessary to reduce the MERI score and improve prognosis.

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