ORIGINAL RESEARCH PAPER

VOLUME-6 | ISSUE-5 | MAY - 2017 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

THE ROLE OF MIDDLE EAR RISK INDEX ON THE OUTCOME OF TYMPANOPLASTY-A Prospective Study.

ENT

Ramesh Babu Kalyanasundaram

Gitanjali Narendran.

ABSTRACT

AIMS AND OBJECTIVES: To determine the MERI score and categorise the patients into mild, moderate and severe MERI and study the relation between MERI and outcome of tympanoplasty.

MATERIALS AND METHODS: The study consisted of 50 patients undergoing tympanoplasty for mucosal or squamous type of CSOM. The MERI score was calculated. The patients were categorised into those with mild, moderate and severe MERI. The graft uptake status was assessed. The relation between MERI score and graft status was assessed by T test.

RESULTS: The overall graft uptake was 76%. Patients with a high MERI score have lower rate of graft uptake which is statistically significant with a P value of 0.031.

CONCLUSION: MERI score is a prognostic tool to predict the outcome of tympanoplasty. It has an inverse relation with graft uptake status. Based on MERI score, the chances for surgical success should be explained to the patient.

KEYWORDS:

Middle Ear Risk Index. Tympanoplasty, Graft uptake, CSOM.

AIMS AND OBJECTIVES

1. To determine the Middle Ear Risk Index in patients with chronic suppurative otitis media undergoing tympanoplasty
2. To categorise the patients into mild, moderate and severe disease based on MERI score
3. To study the relation between MERI score and success of tympanoplasty

INTRODUCTION

The results of tympanoplasty depend to a large extent on the severity of disease in the middle ear which is present preoperatively. Various grading systems were developed for this such as Belluci grading, Wullstein and Austin five part system, SPITE system of Black[1], Kartush's intrinsic and extrinsic factors[2]. The Middle Ear Risk Index developed by Becvarovski and Kartush combines these factors in the middle ear into a numerical value to assess the prognosis of tympanoplasty. Each patient is assigned a numerical score based on the risk factors. The total score is 12. Based on MERI score, the patients are classified as mild disease (1-3), moderate disease (4-6) and severe disease (7- 12). It was modified in 2001. Smoking was added as a risk factor.[3] The present study was done to assess the prognostic value of MERI index on the outcome of tympanoplasty.

MERI score helps to predict the outcome of surgery in terms of success or failure. With increasing numbers of tympanoplasty procedures being performed nowadays, it is important to predict the outcome of surgery and give proper counseling for the patient. The aim of our study is to stratify the patients based on their MERI scores and assess the outcome of tympanoplasty.

MIDDLE EAR RISK INDEX (2001)

RISK FACTOR	RISK VALUE
Otorrhea	Dry - 0
	Occasionally Wet -1
	Persistently wet - 2
	Wet with cleft palate - 3
Perforation	Absent - 0
	Present - 1
Cholesteatoma	Absent - 0
	Present - 2
Ossicular chain	Malleus, incus and stapes present - 0
	Defect of incus - 1
	Defect of incus and stapes - 2
	Defect of incus and malleus - 3
	Defect of malleus, incus and stapes - 4
	Ossicular head fixation - 2
	Stapes fixation - 3
Middle ear granulation/effusion	No - 0
	Yes - 2
Previous surgery	None - 0
	Staged - 1
	Revision - 2
Smoker	No - 0
	Yes - 2

MATERIALS AND METHODS

This study is a prospective study which was conducted in the Department of Otorhinolaryngology and head and neck surgery, Thanjavur medical college hospital, Thanjavur, Tamil nadu from NOVEMBER 2013 to OCTOBER 2015. The study group comprises 50 patients with chronic suppurative otitis media both mucosal and squamous type with hearing loss planned for tympanoplasty with or without mastoidectomy. Patients with systemic diseases, Otomycosis and other septic foci which can influence the outcome of tympanoplasty were excluded from the study.

Detailed history was obtained from the patient such as the nature of ear discharge, the period of dryness, hearing loss, other medical illness, history of smoking, previous ear surgery and long term use of ototoxic drugs. Otoscopic examination was done to find the presence or absence of perforation, granulation tissue and cholesteatoma. Examination of nose and paranasal nasal sinuses and throat was done to rule out septic foci.

Basic investigations such as complete blood counts, aural swab culture sensitivity, Pure Tone Audiometry and CT temporal bone were taken. Otoendoscopy and otomicroscopy were done to confirm the otoscopic findings and also in large perforations, the middle ear mucosa, any polypoidal changes in middle ear, the ossicles, and attic were inspected The middle ear risk index was calculated. The patients were stratified into those with mild(0-3), moderate(4-6) and severe(≥7) MERI.

The type of tympanoplasty and mastoidectomy was decided intraoperatively based on the extent of disease in middle ear and mastoid. Temporalis fascia graft was used for all patients.

Graft status was analysed by otoscopy.

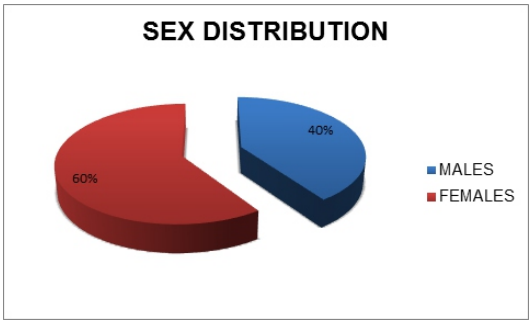
a) Successful - the healed graft with proper middle ear aeration.
b) Atelectatic graft.
c) Graft failure or perforation of graft.

RESULTS AND ANALYSIS

This study was conducted in the department of *ENT AND HEAD & NECK SURGERY, THANJAVUR MEDICAL COLLEGE AND HOSPITAL, THANJAVUR, TAMILNADU* for a period of two years from november 2013 to august 2015. The study group consists of 50 patients with chronic suppurative otitis media of both mucosal and squamous type.

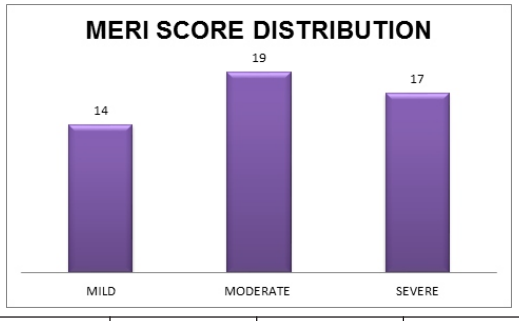
AGE	NO. OF PATIENTS	PERCENTAGE
0 - 10 YEARS	3	6
11 - 20 YEARS	18	36
21 - 30 YEARS	16	32
31 - 40 YEARS	9	18
41 - 50 YEARS	4	8

The study comprises 19 males and 31 females.



29 patients belong to mucosal or tubotympanic type of CSOM and 21 patients belong to the squamous type or the atticoantral type.

The study group comprises 14 patients with mild (1-3) MERI score, 19 patients with moderate (4-6) MERI score and 17 patients with severe (≥ 7) MERI score.

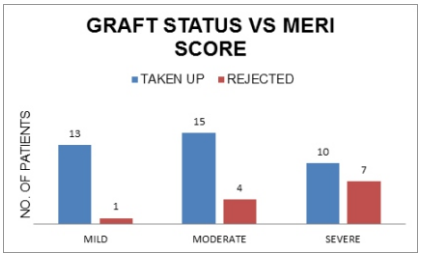


	MILD	MODERATE	SEVERE
TAKEN UP	13	15	10
REJECTED	1	4	7

The data in the table indicates that when the MERI score is mild graft is taken up by 13 patients and rejected for only 1 patient. When the MERI score is moderate the graft is taken up by 15 patients and rejected for only 4 patients when the MERI score is high the chances of graft taken up among patients is low & rejection rate is high .

F	df1	df2	Significance
2.299	10	39	.031

It may be noted from the above table that the p value of .031 is lower than alpha value at 5% level of significance by doing the T Test. Therefore higher the MERI score, lower is the rate of graft taken up in patients.



The graft is taken up for 38 patients (76%) and rejected for 12 patients (24%). Thus the overall success rate of tympanoplasty is 76 %. Among those with mild MERI, graft is taken up for 13 patients and rejected only for 1 patient. Similarly, among those with severe disease, there is higher graft rejection rate (7 patients).

DISCUSSION

Chronic suppurative otitis media is a very common Otorhinol ary ngeal problem worldwide, especially in developing countries. It is more common in rural areas than urban areas and is associated with poor hygiene, illiteracy and is common among the middle and low income groups. Inspite of the availability of wide range of antibiotics, better surgical techniques and newly developed prosthetic materials we are still not able to reach 100% successful outcomes in tympanoplasty. This is due to the extent of pathology in the middle ear and mastoid which affects the outcome. Hence these are summarised and assigned a numerical value, the MERI index, which helps us to identify the extent of disease and thereby predict the outcome of surgery.

In our study, the overall success rate of tympanoplasty is 76 % according to graft status. Manpreet Kaur et al did studies on comparison of graft uptake between tympanoplasty alone and tympanoplasty combined with cortical mastoidectomy in non cholesteatomatous chronic suppurative otitis media in patients with sclerotic bone. They concluded that graft uptake was 76% in patients who underwent tympanoplasty and 88% in tympanoplasty combined with cortical mastoidectomy.[4] *Veysel Yurttafl et al stated that the presence of granulation in middle ear had a negative effect on the hearing improvement after tympanoplasty.* His study concluded that graft uptake rate was only 44.4% in patients with extensive middle ear granulation tissue.[5] He advocated mastoidectomy in addition to tympanoplasty for all patients with active middle ear infection to remove granulation tissue from middle ear and mastoid cavity. Success of hearing reconstruction procedure also depends on the preoperative ossicular status. An intact ossicular system with only a perforation in the tympanic membrane gives the best results. Smoking is asssociated with reduced graft uptake. Zoran Becvarovski stated that delayed failure of the graft was more commonly seen in smokers(60%) than non-smokers(20%). The patients without tympanic membrane perforation had better graft uptake in the absence of other significant middle ear pathology. Many studies have concluded that the rate of graft uptake is lesser with anterior perforations than posterior perforations. This is due to lesser blood supply to anterior part of the drumhead and lesser surgical access to the anterior part. Cholesteatoma is associated with reduced rate of graft uptake and hearing benefit. Generally canal wall down procedure is done for extensive cholesteatoma . There is higher rate of recurrence especially if there is cholesteatoma in inaccesible sites. Cholesteatoma recurrence is more than twice common in children than adults according to Stankovic M[6].

CONCLUSION

- The study group comprises 50 patients, of which 19 were males and 31 were females. Most of them belong to the lower middle class, with malnutrition and poor literacy.
- MERI score is a useful measure of the extent of disease in the middle ear.
- Higher the MERI score, lower is the rate of graft taken up in patients and patients with lower MERI have higher rate of graft uptake.

- MERI score helps us to determine whether to proceed with canal wall up or down mastoidectomy.
- Based on the MERI score, the goals of surgery should be determined and the extent to which surgical success and hearing benefit can be obtained should be explained to the patient.

REFERENCES

1. Black B. Ossiculoplasty prognosis: the spite method of assessment. Am J Otol. 1992 Nov;13(6):544–551.
2. Kartush JM. Ossicular Chain Reconstruction: capitulum to alleus. Otolaryngol Clin North Am 1994;27:689-715.
3. Becvarovski Z, Kartush JM. Smoking and tympanoplasty: implications for prognosis and the Middle Ear Risk Index (MERI). Laryngoscope 2001;111:1806-11.
4. Manpreet Kaur et al. Comparative Evaluation between Tympanoplasty Alone & Tympanoplasty Combined With Cortical Mastoidectomy in NonCholesteatomatous Chronic Suppurative Otitis Media in Patients with Sclerotic Bone. IOSR Journal of Dental and Medical Sciences. Jun. 2014;13(6):40-45.
5. Veysel Yurttafl, Ahmet Ural, Ahmet Kutluhan, Kaz›m Bozdemir. Factors that may affect graft success in tympanoplasty with mastoidectomy. ENT Updates 2015;5(1):9–12.
6. Stankovic M. Follow-Up of Cholesteatoma Surgery: Open versus Closed Tympanoplasty. ORL 2007;69:299–305.