

A Comparative Study on Outcomes of Medical and Surgical Treatment of Otitis Media with Effusion

Dr.Samit Lal^{1*}, Dr.Arun Kumar²

^{1*}MS ENT, Senior ENT Consultant, Dr lals hospital, Kadru , Ranchi, Jharkhand.

²MS ENT, Junior Consultant, Dr lals hospital, Kadru , Ranchi, Jharkhand.

Corresponding Author: Dr.Samit Lal

Abstract

Introduction: Otitis media with effusion syn. 'Glue Ear' is best defined as the presence within the middle ear cleft of an effusion which may be serous, mucoid, serosanguinous with intact tympanic membrane.

Materials and Methods: The study was conducted in Dr lals hospital, Kadru , Ranchi, Jharkhand and is a non-randomised controlled, prospective study. Sample size was taken conveniently. A total number of 70 patients from age 5 - 30 years, suffering from persistent otitis media with effusion and adenoid hypertrophy were selected from the outpatient department of ENT after detailed clinical examination and investigations. Exclusion criteria involves patients with OME but no adenoid hypertrophy, previous history of any surgery for this condition, suspected neoplastic lesion of posterior nasal space, presence of craniofacial abnormality and any history of radiotherapy in the region concerned.

Results: A total number of 70 patients with age distribution of 50% in the age group of 5 - 9 years, 20% in 10 - 14 years and 30% in 15-30 years. Males were predominant in the study. Hearing improvement was assessed after completion of the treatment. Post-operative complication at the end of 6 months follow-up visit were tube blockage (8%), tube extrusion (6%), ear discharge (12%) and dry perforation (4%).

Conclusion: The myringotomy plus grommet insertion along with adenoidectomy/adenotonsillectomy gave equivocal outcomes as myringotomy with grommet insertion alone. Adenoidectomy/adenotonsillectomy is effective surgical procedure to improve Eustachian tube function and hearing in children when indicated.

Key Words: OME, myringotomy, Otitis media

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I. Introduction

Otitis media with effusion syn. 'Glue Ear' is best defined as the presence within the middle ear cleft of an effusion which may be serous, mucoid, serosanguinous with intact tympanic membrane.¹

It results from a dysfunction of the mucociliary system of the middle ear cleft causing negative pressure and accumulation of fluid. Many factors have been implicated in the failure of the clearance mechanism including ciliary dysfunction, mucosal oedema, hyperviscosity of the effusion and possibly an unfavourable pressure gradient.² The classic explanation proposes that eustachian tube dysfunction is the necessary precursor. In long-standing dysfunction, the negative pressure elicits a transudate from the mucosa leading to the eventual accumulation of a serous, essentially sterile effusion. Young children are more prone to AOM and OME due to an anatomical predisposition.³ The eustachian tube is shorter, more flexible and horizontal, which allows nasopharyngeal pathogens to enter the middle ear with relative ease. The newer theories supports the primary event, as inflammation of the middle ear mucosa caused by a reaction to bacteria already present in the middle ear. Once the acute inflammation and bacterial infection have resolved, a failure of the middle ear clearance mechanism allows middle ear effusion to persist. The commonly found bacteria in order of frequency are Streptococcus pneumoniae, Haemophilus influenzae and Moraxella catarrhalis.⁴

OME has a lower prevalence in adults and is then frequently associated with other underlying diagnoses. Finkelstein et al described paranasal sinus disease as the dominant factor in 66% of adults with OME.⁵

The clinical features include a history of hearing difficulties, poor attention, behavioural problems, delayed speech and language development, clumsiness and poor balance. Otoscopic findings are observable air-fluid levels, serous middle ear fluid and a translucent membrane with diminished mobility.⁶ Extensive inflammation and purulent middle ear effusion should not be evident. The negative pressure is suggested by the prominence of the lateral process, a more horizontal orientation of the malleus and movement only with negative pneumatoscopy. Tonsillar hypertrophy can accompany the more commonly adenoid hypertrophy, especially in patients with prolonged or recurrent condition.⁷

Objective

The aim of this study is to assess the outcomes of surgical treatment outcomes compared to the medical treatment of otitis media with effusion.

II. Materials And Methods

The study was conducted in Dr lals hospital, Kadru , Ranchi, Jharkhand and is a non-randomised controlled, prospective study. Sample size was taken conveniently.

A total number of 70 patients from age 5 - 30 years, suffering from persistent otitis media with effusion and adenoid hypertrophy were selected from the outpatient department of ENT after detailed clinical examination and investigations. Exclusion criteria involves patients with OME but no adenoid hypertrophy, previous history of any surgery for this condition, suspected neoplastic lesion of posterior nasal space, presence of craniofacial abnormality and any history of radiotherapy in the region concerned.

Patients were serially placed according to the date of registration in three groups. Group 1 were subjected to medical management with antibiotics and short-term steroid therapy. Group 2 underwent myringotomy and grommet insertion and Group 3 underwent myringotomy and grommet insertion along with adenoidectomy or adenotonsillectomy.

A follow-up of 6 months was done at an interval of two weeks to determine the symptomatic improvement and status of grommet. The PTA and tympanometry were repeated at one month and three months post-operative period and evaluated.

The outcomes of each group were studied statistically using the SPSS v16.0, (ANOVA test, paired T-test, Bonferroni post-hoc test), MS Excel etc.

III. Results

A total number of 70 patients with age distribution of 50% in the age group of 5 - 9 years, 20% in 10 - 14 years and 30% in 15-30 years. Males were predominant in the study. Hearing improvement was assessed after completion of the treatment.

Group	Pre-treatment A/B Gap	Post-Treatment A/B Gap	Improvement
Group I (n=20)	14.00 ± 5	12 ± 4	2 ± 5 P=0.104
Group II (n=34)	23.23 ± 7	14.41 ± 5	8.82 ± 5 P: 0.001
Group III (n=16)	24.37 ± 8	15 ± 6	9.37 ± 6 P=0.001

Table 1: Hearing Results

Paired T-tests were done for each treatment group and it was found that pre-treatment and post-treatment A/B gaps improvement were significant for treatment Group 2 and Group 3.

	Group I	Group II	Group III	P Value
Post Treatment A/B gap	12 ±4	14.41±5	15±6	0.000

Table 2: Post-Treatment Overall Outcome

Treatment Group (a)	Comparison Group (b)	Mean Difference in a/b closure (a-b)	P Value
Group 1	Group 2	-6.82	0.000
	Group 3	-7.37	0.001
Group 2	Group 1	6.82	0.000
	Group 3	-0.55	1.000
Group 3	Group 1	7.37	0.001
	Group 2	0.55	1.000

Table 3: Post-Treatment Comparison between Groups

On further analysis with help of Bonferroni (post-hoc) test, significant results were found when medical treatment group was compared to surgical treatment groups, but there was no difference found in additional surgery done in Group 3 (Adenoidectomy and/ or tonsillectomy) when compared to myringotomy and tympanostomy tube insertion alone (Group 2).

Post-operative complication at the end of 6 months follow-up visit were tube blockage (8%), tube extrusion (6%), ear discharge (12%) and dry perforation (4%).

IV. Discussion

The present study was carried out to document the clinical and audiological outcomes of patients managed conservatively and surgically.

Current studies do not support routine use of antihistamines and decongestants in children with OM, but they might be used for treatment of specific patients such as those with OME due to allergies. Antimicrobial therapy may provide at least short-term relief for symptomatic children (Hearing loss, developmental delay, etc.) for whom surgery must be postponed or is contraindicated.⁸ There is evidence of both benefits and harms associated with the use of oral antibiotics to treat children up to 16 years with OME and were not associated with fewer ventilation tube insertions. American Academy of Otolaryngology 2016 update recommends against using intranasal or systemic steroids, systemic antibiotics and antihistamines, decongestants or both for treating OME. The use of medical treatment showed no significant improvement in the present study as well.

According to the present guidelines, clinicians should offer bilateral tympanostomy tube/ grommet insertion to children with bilateral OME for 3 months or longer (Chronic OME) and documented hearing difficulties. They also should offer bilateral tympanostomy tube insertion to children with recurrent AOM, who have unilateral or bilateral middle ear effusion at the time of assessment for tube candidacy. Lieberthal AS, Carroll AE et al suggests both ventilation tubes and prophylactic antibiotics are only effective for the duration of ventilation tube stay time (most ventilation tubes extrude 6-9 months after placement) or for as long as antibiotics are taken, respectively. In our present study, we found significant outcomes on myringotomy and tympanostomy tube insertion as hearing levels improved and were symptomatically relieved.⁹

Ventilation tube insertion is associated with a number of risks which include purulent otorrhea, myringosclerosis (most common), retraction pockets and persistent tympanic membrane perforations. In addition, once tubes extrude OME may return with one trial of short-term tubes noting that a quarter of children requiring a second set of ventilation tubes within 2 years. Ear discharge was found to be most common complication post TT placement in our study.

Adenoidectomy is also thought to have a role in preventing recurrent OME, but due to associated risks it is typically not recommended as a primary treatment of OME, unless there are frequent or persistent upper respiratory tract infections. Adenoidectomy +/- tonsillectomy played as an adjuvant role in our study as the results were found to be significant when compared to medical treatment, but was not found to be superior to myringotomy and grommet placement alone.¹⁰

Recent advances in the fields of microbiology, biofilm study, vaccine developments, genetics and drug delivery to middle ear offer the potential for better treatments in the future.

V. Conclusion

The myringotomy plus grommet insertion along with adenoidectomy/adenotonsillectomy gave equivocal outcomes as myringotomy with grommet insertion alone.

Adenoidectomy/adenotonsillectomy is effective surgical procedure to improve Eustachian tube function and hearing in children when indicated.

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