



## “Otitis Media With Effusion: Medical and Surgical Outcomes”

Md. Habibur rahman<sup>1</sup>

<sup>1</sup>Assistant Professor, ENT Department, Shaheed Ziaur Rahman Medical College, Bogura, Bangladesh

Submitted:05-05-2022

Accepted: 15-05-2022

### ABSTRACT

**Introduction:** Otitis media with effusion (OME) is defined as a collection of fluid in the middle ear without signs or symptoms of ear infection. In many children OME is usually preceded by an episode of acute otitis media with otalgia and fever particularly so in younger children because of their greater propensity to upper respiratory tract infections. This damages the Eustachian tube epithelium with resultant retention of middle ear fluid. **Methods:** A non-randomised controlled, prospective study was conducted at Dept. of ENT, Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh from January to June 2021. A total number of 60 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. **Results:** A total number of 60 patients with age distribution of 55% in the age group of 5-9 years, 20% in 10- 14 years and 25% in 15-30 years. Males were predominant in the study. Hearing improvement was assessed after completion of the treatment. 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 B and Group C. **Conclusion:** The ears with OME that fails to resolve or recur should be managed with myringotomy and VT insertion or adenoidectomy. 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:** Otitis Media, Eustachian Tube Epithelium, Myringotomy.

### I. INTRODUCTION

Otitis media with effusion (OME) is defined as a collection of fluid in the middle ear without signs or symptoms of ear infection [1]. It typically arises when the Eustachian tubes are not functioning normally. When this happens, pressure changes occur in the middle ear and fluid can accumulate. OME is one of the most commonly occurring childhood illnesses in the United States with more than 2.2 million diagnosed cases each year at an estimated annual cost of 4 billion dollars [2]. As many as 90 percent of children (80% of individual ears) will have at least one episode of OME by age 10, with the majority of cases occurring between the ages of 6 months and 4 years [2, 3]. In many children OME is usually preceded by an episode of acute otitis media with otalgia and fever particularly so in younger children because of their greater propensity to upper respiratory tract infections. This damages the Eustachian tube epithelium with resultant retention of middle ear fluid. OME has a lower prevalence in adults and is then frequently associated with other underlying diagnoses. Finkelstein et al [4] described paranasal sinus disease as the dominant factor in 66% of adults with OME. The clinical features include a history of hearing difficulties, poor attention, behavioural problems, delayed speech and language development, clumsiness and poor balance. Otoloscopic findings are observable air-fluid levels, serous middle ear fluid and a translucent membrane with diminished mobility. Extensive inflammation and purulent middle ear effusion should not be evident. Pure tone audiometry and tympanometry is perhaps the most useful of all tests in association with otitis media with effusion (OME). Tympanometry usually reveals a type B result (Flat) or a type C result (Negative pressure), while pure tone audiometry reveals a conductive hearing loss with wide air-bone gap. In general, AOM follows a favourable course without antibiotic treatment with analgesia and antipyretics being important [5, 6]. Decongestants and antihistamines, local intranasal steroids have been traditionally used for the treatment of OME. When OME is bilateral and persistent for more than 3 months, the chances of natural resolution are much lower and treatment may



be beneficial [7, 8]. Surgery is recommended for persistent disease with significant hearing loss causing morbidity. In previous studies, Myringotomy and aspiration of the fluid showed some improvement of hearing. Grommet tubes are available in a variety of sizes, shapes and materials. All are designed to permit ventilation of the middle ear and mastoid system. Prolonged aeration of the middle ear has been shown to reverse the mucosal hyperplasia and metaplasia that accompany otitis media with effusion.

## II. MATERIALS AND METHODS

A non-randomised controlled, prospective study was conducted at Dept. of ENT, Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh from January to June 2021. A total number of 60 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. Sample size was taken conveniently. 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 A were subjected to medical management with antibiotics and short-term steroid therapy. Group B underwent myringotomy and grommet insertion and Group C 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. Data analysis Windows Version SPSS 19, (ANOVA test, paired T-test, Bonferroni post-hoc test), MS Excel etc.

## III. RESULTS

A total number of 60 patients with age distribution of 55% in the age group of 5-9 years, 20% in 10- 14 years and 25% in 15-30 years. Males were predominant in the study. Hearing improvement was assessed after completion of the treatment.

Table 1: Hearing Results (N=60)

| S. No | Group          | Pre-Treatment |    | Post-Treatment A/B Gap |    | Improvement |    |
|-------|----------------|---------------|----|------------------------|----|-------------|----|
|       |                | Mean          | SD | Mean                   | SD | Mean        | SD |
| 1     | Group A (N=20) | 13.12         | 5  | 13                     | 4  | 2.14        | 5  |
| 2     | Group B (N=20) | 23.22         | 6  | 14                     | 6  | 8.82        | 6  |
| 3     | Group C (N=20) | 24.10         | 7  | 15.35                  | 7  | 9.43        | 6  |

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 B and Group C.

Table 2: Post treatment overall outcome (N=60)

| S. No | Parameter              | Group A | Group B | Group C | P Value |
|-------|------------------------|---------|---------|---------|---------|
| 1     | Post-Treatment A/B Gap | 13±4    | 14±6    | 15.45±5 | 0.000   |

Table 3: Post treatment comparison between Groups (N=60)

| S. No | Treatment Group (a) | Comparison Group (b) | Mean Difference in a/b Closure (a-b) | P Value |
|-------|---------------------|----------------------|--------------------------------------|---------|
| 1     | Group A             | Group B              | -6.72                                | 0.000   |
| 2     |                     | Group C              | -7.51                                | 0.001   |
| 3     | Group B             | Group A              | 6.56                                 | 0.000   |
| 4     |                     | Group C              | -0.53                                | 1.000   |
| 5     | Group C             | Group A              | 7.36                                 | 0.001   |
| 6     |                     | Group 2              | 0.43                                 | 1.000   |



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 C (Adenoidectomy and/ or tonsillectomy) when compared to myringotomy and tympanostomy tube insertion alone (Group B). 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 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 [9]. In our study out of 60 patients with age distribution of 55% in the age group of 5-9 years, 20% in 10- 14 years and 25% in 15-30 years. Males were predominant in the study. Hearing improvement was assessed after completion of the treatment. 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 [10]. 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 [11]. American Academy of Otolaryngology 2016 update recommends against using intranasal or systemic steroids, systemic antibiotics and antihistamines, decongestants or both for treating OME [12]. 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. Our study 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 C (Adenoidectomy and/ or tonsillectomy) when compared to myringotomy and tympanostomy tube insertion alone (Group B). 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%). Lau, Loretta 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 [12]. In our present study, we found significant outcomes on myringotomy and tympanostomy tube insertion as hearing levels improved and were symptomatically relieved. Ventilation tube insertion is associated with a number of risks which include purulent otorrhea, myringosclerosis (most common), retraction pockets and persistent tympanic membrane perforations [13]. 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 [14]. Ear discharge was found to be most common complication post TT placement in our study.

#### V. CONCLUSION

The ears with OME that fails to resolve or recur should be managed with myringotomy and VT insertion or adenoidectomy. 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.

#### REFERENCES:

- [1]. Stool SE, Berg AO, Berman S, et al. Otitis Media With Effusion in Young Children. Clinical Practice Guideline No. 12. Rockville, MD: Agency for Health Care Policy and Research; 1994. AHCPR Publication No. 94-0622.
- [2]. Shekelle P, Takata G, Chan LS, et al. Diagnosis, History, and Late Effects of Otitis Media With Effusion. Evidence Report/Technology Assessment No. 55 (Prepared by Southern California Evidence-based Practice Center under Contract No 290-97-0001, Task Order No. 4). Rockville, MD: Agency for Healthcare Research and Quality; 2003. AHRQ Publication No. 03-E023.
- [3]. Paradise JL, Rockette HE, Colborn DK, et al. Otitis media in 2253 Pittsburgh area infants: prevalence and risk factors during the first two years of life. *Pediatrics*. 1997 Mar; 99(3):318-33. PMID: 9041282.
- [4]. Gates GA, Wachtendorf C, Richard H, Erwin M. Medical treatment of chronic otitis media



- with effusion (secretory Otitis media). *Otolaryngol Head Neck Surg.* 1986; 94:350-4.
- [5]. Mandel EM, Rockette HE, Bluestone CD, Paradise JL, Nozza RJ. Efficacy of amoxicillin with and without decongestant-antihistamine for otitis media with effusion in children. *N Engl J Med.* 1987; 316:432-7.
- [6]. Bluestone CD, Cantekin EI, Beery QC. Certain effects of adenoidectomy on eustachian tube ventilatory function. *Laryngoscope.* 1975; 85:113-27.
- [7]. Paradise JL, Bluestone CD, Rogers KD, Taylor FH, Colborn DK, Bachman RZ, et al. Efficacy of Adenoidectomy for Recurrent Otitis Media in Children Previously Treated With Tympanostomy-Tube Placement: Results of Parallel Randomized and Nonrandomized Trials. *JAMA.* 1990; 263(15):2066-73.
- [8]. Fujioka M, Young LW, Girdany BR. Radiographic evaluation of adenoidal size in children: adenoidal-nasopharyngeal. *Am J Radiol.* 1979; 133:401-404.
- [9]. Pichichero ME, Berghash LR, Hengerer AS. Anatomic and audiologic sequelae after tympanostomy tube insertion or prolonged antibiotic therapy for otitis media. *Pediatr Infect Dis J.* 1989; 8:780-7.
- [10]. Gates GA, Avery CA, Prihoda TJ, Cooper JC. Effectiveness of adenoidectomy and tympanostomy tubes in the treatment of chronic otitis media with effusion. *N Engl J Med.* 1987; 31:1444-51.
- [11]. Mandel EM, Bluestone CD, Paradise JL. Myringotomy with and without tympanostomy tube insertion in the treatment of chronic otitis media with effusion. *Arch Otolaryngol Head Neck Surg.* 1989; 115:1217-24.
- [12]. Lau, Loretta et al. "WITHDRAWN: Grommets (ventilation tubes) for recurrent acute otitis media in children." *The Cochrane database of systematic reviews* vol. 4, 4 CD004741. 6 Apr. 2018, doi:10.1002/14651858.CD004741.pub3
- [13]. Tos M, Holm-Jensen S, Sorensen CH, Mogensen C. Spontaneous course and frequency of secretory otitis in 4-year-old children. *Arch Otolaryngol.* 1982; 108:4-10.
- [14]. Gravel JS, Wallace IF. Effects of otitis media with effusion on hearing in the first 3 years of life. *J Speech Lang Hear Res.* 2000 Jun; 43(3):631-44. PMID: 10877434.