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Medical Management V/S Surgical Management of Otitis Media with Effusion in Children- A prospective study.

ENT

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ABSTRACT

AIM OF THE STUDY: To document clinical profile (presenting manifestation, hearing assessment) of persistent OME with hearing impairment in children. To compare the improvement in hearing after non surgical versus adenoidectomy with bilateral tympanostomy done in a single sitting. METHODS and MATERIALS : This prospective study was carried out in the department of otorhinolarynology, Tanjore Medical College . The study period was from January 2010 to May 2011. 60 children diagnosed with OME and persistent hearing impairment in the age group of 5 – 12 years were studied prospectively. History, otoscopy, tympanometry, acoustic reflexometry and pure tone audiometry findings were recorded before treatment and followed up at 2nd month and 6th month after randomly alloting the children into 2 Groups - A and B each consisting of sample size of 30 and giving a Non surgical management to Group A and surgical management to Group B. **RESULTS:**The mean age at presentation was 8.06 (±2.25) years. 85% of patients had bilateral hearing impairment and 72 % of patients had symptoms of adenoid hypertrophy at presentation. Abnormal findings were noted in 90%, 90%, 94% of ear examination on pneumatic otoscopy, tympanometry, non pneumatic otoscopy and acoustic reflexometry respectively. **CONCLUSIONS:** Bilateral hearing impairment, symptoms of adenoid hypertrophy, significant hearing impairment (≥ 20dB), abnormal findings on otoscopy and tympanometry were present in more than 60% of children presenting with OME and hearing impairment. In our study, Medical management (Group A): 35% of children in Group A showed improvement for a short duration with recurrence associated with hearing impairment. In our study surgical modality of management in the form of adenoidectomy with bilateral tympanostomy done in a single sitting was found to improve hearing significantly better than Medical management , without major complications.

KEYWORDS:

Otitis media with effusion, Tympanostomy, adenoidectomy, pure tone audiometry.

1. INTRODUCTION:

Otitis media with effusion is a common childhood otological condition. Otitis media with effusion (OME) has a high prevalence in children and is responsible for most of the hearing losses in school going age (5-12 yrs) age group. Most cases of OME are relatively asymptomatic with nearly 25% discovered incidentally. Despite this apparent absence of symptoms, the potential impact on hearing, speech, language and cognition highlights the need for timely intervention. Appropriate evaluation, early diagnosis and effective treatment are of utmost importance to prevent morbidity and sequelae. The American Academy of Family Physicians; American Academy of Otolaryngology-Head and Neck Surgery; American Academy of Pediatrics Subcommittee on Otitis Media with Effusion published guidelines in young children in 1994. These guidelines have been useful for practioners to follow appropriate diagnostic methods, treatment and assess follow up in a timely manner. However there were no guidelines for school going children till the beginning of this study. More over a older child differs from a young child in terms of physiologic changes (lymphoid hypertrophy) and ability to communicate his symptoms. Screening the general population for OME is also not advocated in this age group, as most of them would have gone past the age of OME causing significant neurodevelopment delay. However these children's scholastic ability may be severely affected with untreated OME. Any condition that affects the proper functioning of the muco-ciliary system of the upper respiratory tract may predispode to development of MEE. There is a relationship between presence of middle ear effusion and hearing impairment, though in younger children the hearing loss is not always obvious. When covert it may present as speech, language or learning delay and sometimes as behavioural and educational problems. In persistent OME with hearing impairment, the current standard of care is insertion of tympanostomy tube as the first step followed by adenoidectomy in resistant1 cases or when symptoms of adenoid hypertrophy are prominent. Although there are reports of higher success rate when adenoidectomy was done routinely in OME patients, there is still no consensus on this approach. Studies from developing world studying clinical profile and surgical management in OME with hearing impairment are few in number. Availability of detailed data on clinical profile and utility of combining tymp anostomy with adenoidectomy in a single setting in children wit h OME may have a bearing on future management.

MATERIALS AND METHODS:

This prospective Randomised case control study in children with persistent OME with hearing loss was conducted between January 2010 to May 2011 at otorhinolarynology department of Tanjore Medical College .

A detailed clinical profile of patient including demographic profile, duration of effusion (from first documented or observed hearing impairment from parents till presentation), laterality, associated symptoms suggestive of adenoid hypertrophy (mouth breathing, snoring, speech hypo nasality), otoscopy, pneumatic otoscopy, tuning fork test (TFT), ear, nose, and throat findings were recorded . The sample size of 60 children with OME and hearing impairment were randomly allotted into 2 groups. Group A –Medical manag ement given in the form of chewing gum, autoinflation, topical nasal steroids and wait and watch. Group B – Adenoidectomy and bilateral tympanostomy done in single sitting. Audiological evaluation done at 2nd and 6th month after starting of treatment.

The data collected was compared with pre-treatment and post treatment in Group A and Group B with audiological evaluation at 2nd and 6th month with inter group comparison.

RESULTS:

- **Distribution of patients according to age and sex**

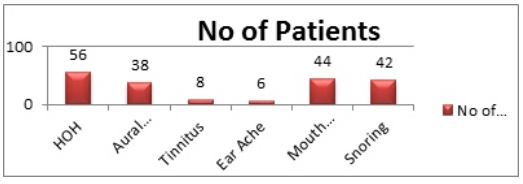
The mean age of children was 8.06 (±2.25) with the range of 5 – 12 years. There was no difference in distribution of patients according to sex or different age categories.

Table 1: Distribution of patients by Age and Sex

Age in years	Male (No of Pts (%))	Female (No of Pts (%))	Total (No of Pts (%))
5-6	12 (20%)	6 (10%)	18 (30%)
7-8	5 (8%)	11(18%)	16 (27%)
9-10	9 (15%)	5 (8%)	14 (23%)
11-12	6 (10%)	6 (10%)	12 (20%)
Total	32 (53%)	28 (47%)	60 (100%)
Mean ±SD	8 ±3.16	7 ±2.71	15 ±2.58

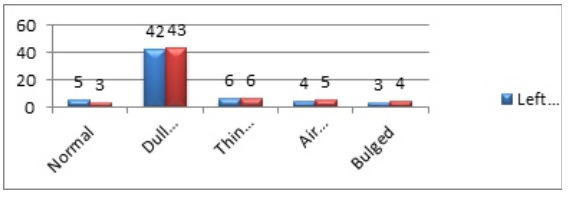
Symptoms of OME – case wise:

Hard of hearing was the most common symptom seen in 56 cases (93%) with bilateral hearing loss seen in 51 cases. Mouth breathing in 44 cases (73%) and snoring in 42 cases (70%) suggestive of adenoid hypertrophy was the second most common symptom. Aural fullness was seen in 38 cases (63%), tinnitus was seen in 8 cases (13 %) , ear ache seen in 6 cases(10%).



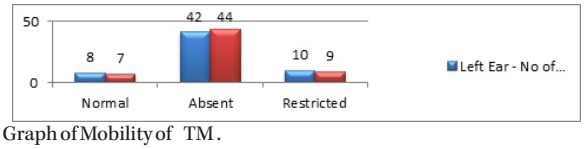
- **Appearance of tympanic membrane on otoscopy**

The evidence of otitis media on otoscopic examination with tympanic membrane abnormality, suggestive of otitis media, with effusion with bilateral involvement seen in 54 cases.



on Otoscopy.

Mobility of TM on pneumatic otoscopy



Graph of Mobility of TM .

Tympanometry:

	Left Ear – No of Patients	Right Ear – No of Patients
Type A	5	4
Type B	42	44
Type C	3	3
Type As	10	9

Type B tympanogram on tympanometry suggestive of little or no change in compliance of tympanic membrane and characteristic of OME was observed in 42 cases in the left ear and 44 in the right ear. Type C pattern of tympanometry suggestive of negative middle ear pressure characteristic of early OME was seen in 14 cases. 10 cases in the left ear and 9 cases in the right ear showed Type As Curve.

Endoscopic grading of adenoid hypertrophy

72% (43) of children had 2nd and 3rd degree adenoid hypertrophy with choanal obstruction. 18% (11) of children had 1st degree adenoid hypertrophy. Adenoid hypertrophy with 2nd and 3rd degree was seen more commonly in the age group of 5 – 8 years.

Tympanostomy and adenoidectomy vs Medical Management:

On analyzing serial air conduction thresholds at baseline, at 2 and 6 months following Surgical intervention,and Non surgical mana gement ,a significant reduction in air conduction threshold was observed. In both groupA and Group B, on Intra group comparison of air conduction thresholds, it was noted that significant reduction in air conduction threshold occurred between baseline and 2 months follow up and between 2 and 6 months following surgery.

DISCUSSION

In this prospective Randomised case control study 60 children with OME and persistent hearing impairment were recruited and outcome following Medical management and surgical treatment were studied. Majority presented with bilateral hearing impairment.

GROUP A

In Group A study, a total of 30 children were randomly allotted and given Medical management in the form of Advise to chew gums daily .Autoinflation in the form of modified politserization with specialized device to be done daily .Topical nasal steroids - mometasone fumarate monohydrate - 100µg / day for a period of 8 to 12 weeks period.

Wait and watch up to 6 months. of the total 30 cases in group A, 28 cases were present for the full study period. 2 cases were drop-outs. All children were regularly followed up with audiometric evaluation done at 2 months and at 6 months with post treatment follow-up. At 2 months follow up ,of the 28 cases 10 cases showed improvement in hearing , the air conduction threshold was <20dB. 6 cases in the range of 20 – 25dB .12 cases did not show any improvement.Then at 6 months, 8 children showed improvement, the air conduction threshold of <20db. 6 children were in the 20 – 25db hearing threshold. Remaining 14 cases did not show improvement in hearing comparing with pre treatment values and were planned for surgical management.

GROUP B

Surgical management in the form of Tympanostomy tube insertion both ears and adenoidectomy were done in a single setting in all patients in Group B. Improvement in air conduction thresholds to <20 dB was noted in 24 (80%) of patients in the right ear and 23(76%) of patients in the left ear at the end of six months following surgery.

There was no difference in mean age between males and females. In this study 34 (57%) patients were less than 8 years old at the time of presentation. At presentation 43 children had symptoms suggestive of adenoid hypertrophy grade II& III. Hearing impairment was persisting for 6 months to 12 months duration in 73% of our patients. Multiple trials with unproven conservative therapies and delay in referral by primary physicians to otolaryngologist could be responsible for prolonged duration of hearing impairment noted in this study. Majority of the patients showed dull and retracted tympanic membrane on otoscopic examination. Nasal endoscopy done in all 60 patients showed features of adenoid hypertrophy Grade II and III with significant obstruction of choanae in 43 cases. 11 Cases showed grade I adenoid hypertrophy. On analysing the relationship of adenoid hypertrophy and the age of the patient it was observed that children in the age group of 5 – 8 years showed significant obstruction of choanae than in the age group of 9 – 12 years. This finding could be secondary to physiological adenoid hypertrophy which is found more commonly in 5 -8 years age group.In the present study Medical management was performed in Group A in the form of: Chewing gum regularly. Autoinflation in the form of modified polisterization at home. Topical steroid – Mometesone fumarate monohydrate 100µg twice daily for 8 weeks. Wait and watch. Were given for the following reasons: Chewing gum have shown significant reduction in prevalence of otitis media with effusion by increasing palatal muscle action which activates peritubal muscles and tubal opening. Autoinflation because of its low cost / absence of adverse effect , it is reasonable to consider autoinflation whilst awaiting natural resolution. Topical steroids mometasone fumarate can significantly reduce adenoid hypertrophy and eliminate obstructive symptoms. It is an useful

alternative to surgery at least in short term38. Intra-nasal steroids in the form of Flunisolide given for 8 weeks has shown significant reduction in adenoid hypertrophy[39]

GROUP B

In the present study, surgery was performed in group B children with pure tone air conduction average of ≥20dB, but had hearing loss on presentation, since even minimal hearing loss places children at risk for language and learning problems.[38] In the present study we performed tympanostomy and adenoidectomy in a single setting. . In the present study, titanium tympanostomy tubes (medium size) Shepard type were used since they are promoted as light weight, micro polished and more tissue compatible[24]. The insertion was done in the antero-superior quadrant of the tympanic membrane as it is more physiological. All patients were available for follow up. Pure tone audio metry (PTA) was recorded at 2nd and 6th month post operatively. Two and six months time period were chosen to ensure good patient compliance and also to ensure sufficient time to allow natural reparative process.. However Maw AR et al followed patients for a period of 12 months following surgery.[36].In our study objective evidence of significant improvements in PTA were noted between surgery and at 2 months follow up . No further improvement occurred later. Whether optimal improvement occurs immediately following surgery or weeks later, could not be answered objectively from this study, as PTA was not done in the intervening period. A number of drawbacks were identified in this study. In group A 20% of patient were not on regular follow up. Some parents were not patient enough to wait for 6 months duration as they wanted immediate cure . In Group B, 3 children had otorrhoea after tympanostomy, 2 children had permanent perforation.

2. CONCLUSIONS

In this study,Bilateral hearing impairment, symptoms of adenoid hypertrophy, significant hearing impairment (≥ 20dB), abnormal findings on otoscopy and tympanometry were present in more than three fourths of children presenting with OME and hearing impairment. Medical management (Group A) were found to show improvement in hearing in the initial period of treatment only for a short duration with recurrence associated with hearing impairment. Tympanostomy tube insertion in both ears and adenoidectomy done in a single setting resulted in significant improvement in hearing impairment without any major complications. In this study Surgical modality of management in the form of Adenoidectomy with bilateral tympanostomy done in a single sitting was found to improve hearing significantly better than Medical management without major complications.

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