



SEROUS OTITIS MEDIA IN CHILDREN: A PROSPECTIVE STUDY.

Paediatrics

**Dr.Ramesh Babu
Kalyanasundaram***

Associate Professor, Thiruvavur Medical College, *Corresponding Author

Dr.Ganesh Kumar

**Dr.Ramanathan
Thirunavukkarasu**

ABSTRACT

Aim: To document hearing assessment and clinical presentation of serous otitis media in children aged 5-12. To compare the improvement in hearing after non-surgical versus adenoidectomy with bilateral tympanostomy done in a single sitting.

Subjects and Methods: This prospective study was carried out in the Department of Oto-rhinolaryngology, Thanjavur Medical College. The study period was from January 2009 to May 2010. Sixty children diagnosed with SOE 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 second month and sixth month after randomly allotting the children into two Groups - A and B each consisting of sample size of 25 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.

Conclusion: Most of the children had bilateral hearing impairment with adenoid hypertrophy, significant hearing impairment (≥ 20 dB). In our study, medical management (Group A): 30% 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 more than 90% compared to medical management, without major complications.

KEYWORDS

Serous otitis media, Tympanostomy, Adenoidectomy, Pure tone audiometry

INTRODUCTION

It can be difficult to distinguish Acute otitis media from serous otitis media with effusion (OME). "Otitis media with effusion" refers to a presence of fluid in the middle ear without signs or symptoms of an acute infection. OME can be persistent and result in short- and long-term hearing loss due to decreased movement of the TM and conduction delay.

Diagnosis of OME is best made with pneumatic otoscopy. A cloudy TM with impaired mobility and possibly an air-fluid level in the middle ear, without a history of acute inflammatory symptoms, is suggestive of OME. Redness of the TM alone is not enough to distinguish between AOM and OME.

OME tends to be self-limited and should be watched without intervention for 3 months. Spontaneous resolution is the most likely outcome. OME in children at risk for learning or speech difficulties should receive early referral for evaluation and intervention. There is no role for antihistamines, decongestants, or corticosteroids in the treatment of OME.

MATERIALS AND METHODS

This prospective randomised case control study in children with persistent SOE with hearing loss was conducted between January 2009 and May 2010 at the Department of ENT, Thanjavur Medical College. A detailed clinical profile of patient including demographic profile, duration of effusion (from first documented or observed hearing impairment from par-ents 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 SOE and hearing impairment were randomly allotted into two groups. Group A – Medical management given in the forms of gum chewing, autoinflation, topical nasal steroids and wait and watch. Group B – Adenoidectomy and bilateral tympanostomy done in a single sitting. Audiological evaluation done at the second and sixth month after starting of treatment. The data collected were compared with pre-treatment and post-treatment in Group A and Group B with audiological evaluation at the second and sixth 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.

Symptoms of SOE – 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%)

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

TM Mobility on pneumatic otoscopy

Type B tympanogram on tympanometry suggestive of little or no change in compliance of the tympanic membrane and characteristic of SOE 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 SOE was seen in 14 cases. Ten 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.

Age in Years	Male(No. of patients(%))	Female(No. of patients(%))	Total (No of patients (%))
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 $\pm$ SD	8 $\pm$ 3.16	7 $\pm$ 2.71	15 $\pm$ 2.58

Tympanostomy and adenoidectomy vs. medical management

On analyzing serial air conduction thresholds at base-line, at 2 and 6 months following surgical intervention, and non-surgical management, a significant reduction in air conduction threshold was observed. In both Group A 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 SOE and persistent hearing impairment were recruited and outcomes following medical management and surgical treatment were studied. The majority were presented with bilateral hearing impairment.

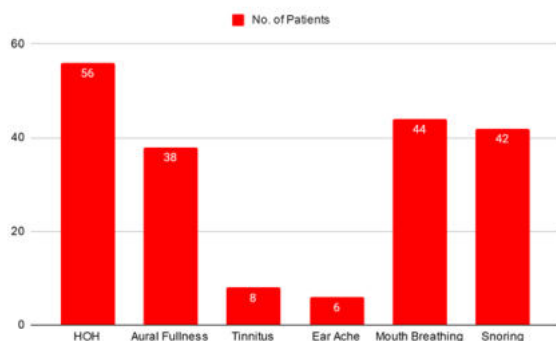


Fig 1

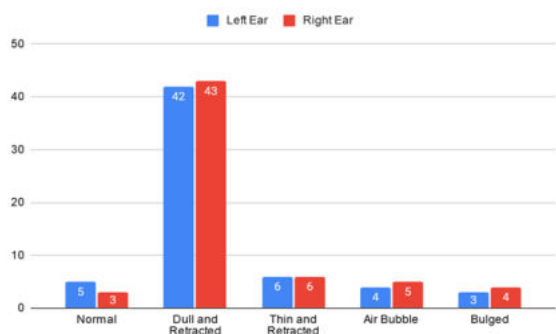


Fig 2 : TM on otoscopy

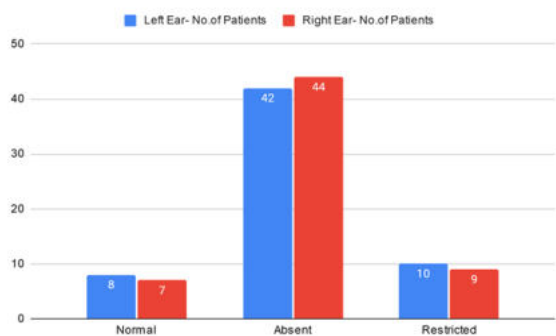


Fig 3 : Graph of mobility of TM

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

Group A

In Group A study, a total of 30 children were randomly allotted and given medical management as follows:

- Advised to chew gums daily.
- Autoinflation in the form of modified politzerization with specialized device to be done daily
- Topical nasal steroids – mometasone fumarate monohydrate – 100 µg/day for a period of 8- to 12-week period.

They were monitored up to 6 months. Of the total 30 cases in Group A, 28 cases were present for the full study period, and 2 cases were drop-outs. All children were regularly followed up with audiomet-ric 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 hear-ing, and the air conduction threshold was <20 dB. Six cases were in the range of 20–25 dB. Twelve cases did not show any improvement. Then at 6 months, 8 children showed improvement, and the air conduction threshold was <20 dB. Six children were in the range of 20–25 dB hearing threshold. Remaining 14 cases did not show improvement in hearing comparing with pretreatment 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 6 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 presenta-tion, 43 children had symptoms suggestive of adenoid hypertrophy Grade II & III. Hearing impairment per-sisted 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. The majority of the patients showed dull and retracted tympanic membrane on otoscopic examination. Nasal endoscopy done in all 60 patients showed the features of adenoid hypertrophy Grade II and III with signifi-cant obstruction of choanae in 43 cases. Eleven 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 choa-nae than in the age group of 9–12 years. This finding could be secondary to physiological adenoid hyper-trophy, 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: gum chewing regularly, autoinflation in the form of modified politzerization at home. Topical steroid – Mometasone fumarate monohydrate 100 µg was applied twice daily for 8 weeks, and monitored. Chewing gum has shown significant reduction in the prevalence of Serous otitis media by increasing the palatal muscle action which activates peritubal muscles and tubal open-ing. Autoinflation because of its low cost/absence of adverse effect, it is reasonable to consider autoinfla-tion whilst awaiting natural resolution. Topical steroids mometasone fumarate can significantly reduce adenoid hypertrophy and eliminate obstructive symptoms. It is a useful alternative to surgery at least in short term. Intranasal steroids in the form of flunisolide given for 8 weeks has shown significant reduction in adenoid hypertrophy.

Group B

In the present study, surgery was performed in Group B children with pure tone air conduction average of ≥ 20 dB, but had hearing loss on presentation, since even minimal hearing loss places children at risk for language and learning problems³⁸. 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 compatible²⁴. 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 the second and sixth month post-operatively. Two and six months time period were chosen to ensure good patient compliance and also to ensure sufficient time to allow the natural reparative process. However, Maw et al. followed patients for a period of 12 months following surgery.³⁶ In our study, objective evidence of significant improvements in PTA was 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 identi-fied in this study. In Group A, 20% of patients 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, and 2 children had permanent perforation.

CONCLUSIONS

Most of the children had bilateral hearing impairment with adenoid hypertrophy, significant hearing impairment (≥ 20 dB). In our study, medical management (Group A): 30% 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 more than 90% compared to medical management, without major complications.

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