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A. Mohammed Siyad
MBBS, Resident, Department
of ENT Sri Lakshmi Narayana
Institute of Medical Sciences,
Puducherry, India.

R. Venkataramanan
MBBS MS, Professor and
Head, Department of ENT Sri
Lakshmi Narayana Institute of
Medical Sciences, Puducherry,
India.

Muhammed Nabeel Latheef
MBBS, MS, Assistant
Professor, Department of ENT
Mahatma Gandhi Medical
College and Research Institute,
Puducherry, India.

Correspondence:

A. Mohammed Siyad
MBBS, Resident, Department
of ENT Sri Lakshmi Narayana
Institute of Medical Sciences,
Puducherry, India.

Secretory Otitis Media – A Clinical Prospective Study and its Management

A. Mohammed Siyad, R. Venkataramanan, Muhammed Nabeel Latheef

Abstract

Background: Most common cause of hearing impairment in children. Acute Secretory Otitis media (SOM) is preceded by episode of upper respiratory tract infection. Acute SOM causes damage to Eustachian tube epithelium. Increased secretory action of middle ear mucosa. Followed by retention of fluid in middle ear. SOM is a self-limiting condition. This study was conducted to assess the prevalence of SOM among school children in Puducherry. **Methods:** A community based cross sectional study was conducted among 200 school children of class IV to VIII from February to October 2019 using convenient sampling. Pretested semi structured questionnaire was used to collect the sociodemographic profile of the participants and pediatric Otolaryngoscope for ear examination. The study population included children with complaints of hard of hearing, otoscopic evidence of SOM and repeated episodes of ear discharge. Both tympanometry and acoustic reflex testing were done. Examination under microscope was done for confirming the otoscopic findings. The collected data were analysed using SPSS 22 and represented in proportions and chi square. **Result:** Most commonly affected age 6-8 years. Male affected more than females. Most common symptom was hard of hearing. Most patient had hearing loss of 20-40 db. Out of 200 patients, 35 male children and 30 female children were diagnosed of SOM. **Conclusion:** About 27 % of children had SOM. This should be taken into account as an emerging health care problem in children. Proper periodic checking should be done in school children from age 5-15.

Keywords: Acute secretory otitis media, children, hard of hearing

Introduction

Secretory otitis media is the most common cause of hearing impairment in children. It is defined as the persistence of mucoid or serous middle ear effusion for 12 weeks or more. It can also be called as exudative otitis media, seromucinous otitis media, non-suppurative otitis media, otitis media with effusion, catarrhal otitis media. The term secretory is the most appropriate as it reflects the most particular aspect of pathological process. The term otitis media with effusion helps in differentiation of the types of effusion and facilitates distinction into acute, chronic, serous or mucinous type.

Secretory otitis media is generally self-limiting condition. The effects are usually short term, but in children in whom there is recurrent episode throughout childhood, some effects on cognition and behavior are detectable up to the age of 10 years in adults sometimes it can lead on to atelectatic otitis media which can cause cholesteatoma formation. This study was performed to evaluate clinically and to find out the effective methods of managing this condition. This study was performed in Department of ENT, Sri Lakshmi Narayana Institute of medical sciences in patients who report with symptoms of conductive hearing loss.

Materials and Methods

This study was done in the Department of ENT, Sri Lakshmi Narayana Institute of medical science, Pondicherry.

It consists of 50 patients and their age ranges from 4 years to 50 years.

Inclusion Criteria: Patients with the following conditions

1. Complaints of hard of hearing/blocking or discomfort sensation of the ear for more than 2 months.

- Otoscopic evidence suggestive of secretory otitis media
- An impedance audiometry result with type 'B' or 'C' curve.
- Patients with combination of two or more of these criteria were included in the study.

Exclusion Criteria:

- Patients having acute ear pain, eardischarge.
- Patients who were deaf since childhood or with family history of hard of hearing.
- Patients with cleft palate, benign and malignant tumors of nasopharynx.

A detailed history was taken for all patients. All patients were examined with a pneumatic otoscope and the findings were recorded in 3 different formats as:

- Normal tympanic membrane
- A thin semitransparent tympanic membrane with air bubble or fluidlevel.
- A dull or yellowish/opaque, retracted/bulging lustreless tympanic membrane with distorted or absent cone of light

Other clinical examination was also performed like nasal, oral cavity examination, tuning fork tests were also performed. Patients with chronic sinusitis, allergy, chronic adenotonsillitis were segregated.

Both tympanometry and acoustic reflex testing were done. Radiological investigations in the form of PNS X-ray (occipito mental view) done in suspected cases of chronic sinusitis and assessment were made regarding pharyngeal end of Eustachian tube orifice and adenoids by diagnostic nasal endoscopy.

Examination under microscope was done for confirming the otoscopic findings. The predisposing factors for otitis media with effusion if present were recorded.

One group of patients (25 Nos) were given medical treatment for 6 weeks which included.

- Antibiotics, antihistamines, anti inflammatory drugs, nasal decongestants.
- They were given instruction to perform valsalva manoeuvre, 3-5 times aday.

Improvement in medical treatment is considered in:

- Patients having symptomatic relief.
- Otoscopically tympanic membrane become normal.
- Pure tone audiometry showed good improvement in hearing air bone gap shows <10dB

Other group of patients (25 Nos) were subjected to Surgical management which includes:

- Myringotomy and grommet insertion: Shephards grommet

Adenotonsillectomy with myringotomy and grommet insertion: Shephards grommet

These patients were followed up regularly. Success of the procedure was assessed by following factors:

- Symptomatic improvement
- Otosopic evidence of improvement.

Air bone gap <10dB in postoperative audiogram done after 3 weeks.

Results and Analysis

This study is mainly about the prospective analysis, incidence, predisposing factors, clinical features and the treatment outcome of medical, surgical management conducted in the Sri Lakshmi Narayana institute of medical science, Pondicherry.

The statistical profile shows the most common age group affected was between 5 to 15 years. Of the 50 patients studied 56% (27 patients) were male and 44% (23 patients) were female. In the different age groups there was no significantly noticeable difference between male and female patients.

The most common symptom associated was hard of hearing which was seen in 55% of patients followed by ear fullness (20%), otalgia (15%), nasal symptoms (10%). On otoscopic examination, most common sign was tympanic membrane impaired mobility which accounted for 60% of patients, preceded by retracted tympanic membrane (25%), then fluid level (15%).

Eustachian tube function was checked by diagnostic nasal endoscopy and pneumatic otoscopy. Adenoid hypertrophy being the common predisposing factor found in 80% of patient, followed by allergy (12%), GERD (8%).

Most of the patients had hearing loss in the range of 20-40 db (70%). About 75% of patients had B curve, 25% patients had 'C' curve.

Our patients were randomized into mainly 2 arms. medical treatment arm and surgical treatment arm, and the end results were analyzed in terms of pure tone audiogram result, symptomatic relief, and pneumatic otoscopy. In 25 patients who were taken up for medical treatment 60% of patients had shown significant reduction in the air bone gap with air bone gap less than 10 db as before to the pretreatment values. 50% of the patients had their tympanic membrane returned to normal appearance. Only 20% of the patients had symptomatic relief.

Considering the patients with 2 of the 3 factors (tympanic membrane returned to normal appearance, air bone gap less than 10db, symptomatic relief) as successful outcome of medical treatment, only 38% (10 patients) had successful outcome. Patients in surgical treatment arm (25 No's) along with patients (15 No's) who were considered as failure of medical management, a total of 40 patients were subjected to surgical management.

Out of the 40 Patients who underwent surgical treatment 75% showed a significant improvement when the criteria for successful outcome was taken. Out Of the 15 patients who were taken up for surgical treatment due to failure of medical treatment, 5 patients still did not show any significant improvement even after surgical treatment.

Table 1: Symptomology.

Symptoms	No. of Patients
Hard of Hearing	33
Otalgia	25
Ear Fullness	26
Nasal Symptoms	14

Table 2

Sign	No. of Patients
Fluid Level	21
Immobility	47
T.M. Retraction	30

Table 3: Pre-Disposing Factors.

Predisposing Factors	No. of Patients
ET – Dysfunction	32
Allergy	10
Cleft Palate	0
GERD	8

Table 4: Medical Management-Results.

Results of Medical Treatment	No. of Patients
Symptomatic Relief	7
TM Normal	13
Air bone gap < 10 db	15

Table 5: Surgical Management-Results.

Results of Surgical Treatment	No. of Patients
Symptomatic Relief	12
TM Normal	26
Air bone gap < 10 db	27

Table 6: PTA Evaluation.

Hearing Loss in db	No. of Patients	
	R	L
20 – 30	13	14
31 – 40	22	20
41 – 50	10	7
51 – 60	3	0
61 - 70	0	0

Table 7: Tympanometry-Results.

Tympanometry	No. of Patients	
	R	L
A	0	0
Ad	0	0
As	0	0
B	36	41
C	14	9

Discussion

Zielhius et al¹ reviewed around 23 studies which used tympanometry as one of the diagnostic tool to provide an age specific prevalence rates and observed that the prevalence is bimodal with first peak, at 2 years. Second peak was when child attends a play group or nursery school, and then at 5 years of age when the child attends a primary school. But in our study there was no bimodal prevalence. About 60% of the patient were in the age group 5-15years.

According to Tos et al,² Rovers et al,³ secretory otitis media shows an increased prevalence in temperate climate when compared to summer, this is probably due to increased incidence of upper respiratory tract infection. Engels et al,⁴ Rovers et al,⁵ has concluded that there is slightly more risk in boys when compared to girls. In our study also there was more incidence in boys(58%)

Eustachian tube dysfunction can lead to poor aeration of middle ear cleft. Most commonly it is secondary to Allergy, Adenoid infection, GERD, Upper Viral Respiratory infection, or disorder in palatine Muscles. In our study, ET dysfunction was the major predisposing factor seen in 66% of patients followed by allergy (12%), GERD (8%).

American academy of paediatrics has strongly recommended the usage of pneumatic otoscopy as the

primary diagnostic method. Tympanometry alone is a useful screening tool in the investigation secretory otitis media.⁶

Wafters GW, Jones JE in published in clinical otolaryngology about the predictive values of tympanometry in the diagnosis secretory otitis media. A type B tympanogram has a high sensitivity (0.90) in predicting middle ear effusion with good specificity (0.4) type ‘C’ increases the sensitivity of predicting dry middle ear to 0.78. In our study, type B curve was found in 76% and type ‘C’ curve was found in 24%. Gates and other³⁹ found that in 45% of cases treated with antibiotics erythromycin ethylsuccinate and sulfisoxale, effusion cleared in one month and 55% cleared in two months. Mandle et al ⁷ in their study found that with amoxicillin, the clearance of effusion was significantly better than in the control groups. Blue stone et al ⁸ in their study found that the clearance of effusion did not show much difference between the groups who received a decongestants – antihistamine and placebo. Lambert et al, Rovers proposed that there is short term benefit with Prednisolone (1mg/kg) the clearance of the effusion is sling and temporary

Based on the rationale of adenoidectomy for children with Otitis media on size alone, has little scientific basis. But Gates et al, paradise et al, have demonstrated the effectiveness of adenoidectomy in the management of secretory otitis media. Further clinical evidence from the above studies propose that the effect of adenoidectomy is independent of adenoid size. The other classic rationale is improvement in Eustachian tube function. Honjo ⁹ showed improvement in equilibration of positive middle ear pressure after adenoidectomy but no specific change in the ability to equilibrate negative pressure and also no change in the static opening pressure of the tube. Obstruction or dysfunction of the Eustachian tube either anatomic or functional is a logical rationale for the procedure.

Gates and others ¹⁰ found a significantly better result in terms of hearing, longer time to recurrence , decreased duration of middle ear effusion, , and fewer repeat operations in the children with tympanostomy tubes as compared with those who were undergoing myringotomy and aspiration. Similar conclusions were reached by Madel, Bluestone, and Paradise.¹¹ Paradise¹² and paradise and others¹³ argued that tympanostomy tubes should be used as the primary procedure of choice for patients with persistent OME, because tympanostomy tube placement is less expensive and less involved than adenoidectomy. They reserve adenoidectomy for cases with recurrent secretory otitis media.

Conclusion

From our studies it is evident that secretory otitis media is a treatable condition of conductive hearing loss in children. In children, Eustachian tube dysfunction was mostly secondary to functional or mechanical obstruction and the common precipitating factor for secretory otitis media. GERD also was found to be associated with almost all adult patients. Study should be conducted about control of acid reflux can have any effect in these patients. From our study it was clear that medical management is useful in the control of acute episodes of secretory otitis media which is associated with frequent relapse and recurrence.

Surgical management in the form of myringotomy / adenoidectomy with grommet insertion has shown to have

better long-term outcome in terms of hearing impairment and disease relapse and recurrence. In our study we used Shepards tympanostomy tubes which was associated with extrusion rate of 10% at 3 months follow up period. Further studies should be done to compare the efficacy of various tympanostomy tubes on disease control and various complications. A long term follow up is needed to evaluate the disease relapse and recurrence, also to study the various sequelae of secretory otitis media like adhesive otitis media and cholesteatoma.

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