MANAGEMENT OUTCOME OF SECRETORY OTITIS MEDIA

Farida Khan, Muhammad Asif, Gulshan Hussain Farooqi*, Shahid Ali Shah, Tahira Sajid, Rehman Ghani

Department ENT, Ayub Medical College, Abbottabad and *Saidu Medical College, Swat

Background: Secretory otitis media is a common otological manifestation, that most of the time is left undiagnosed on account of unawareness and negligence in seeking early medical attention for trivial ailments. Untreated, it might end up in serious consequences in the form of poor speech and intellectual development and permanent anatomical disabilities within middle ear cleft. The objectives of the study were to determine most affected age group, the common etiological factors, to access the efficacy of medical and surgical treatment and finally to find out the complication associated with the surgical procedures. **Methods**: This study was conducted in the ENT, Head and Neck Surgery department of the Ayub Teaching Hospital, Abbottabad from January 2001 to December 2003.Only the diagnosed cases of SOM were included in the study. After detailed history, clinical examination, routine investigations and special investigations such as pure tone audiogram and tympanometry were carried out to confirm the diagnosis of SOM . All patients were initially treated by medical therapy. In cases of failure, underwent myringotomy with or without ventilation tube insertion and where indication present adenotonsillectomy and antral lavage was done. Follow up of cases was carried out from 18-24 months. **Results:** It included 87 patients, 58 were males (66.6%) and 29 females (33.3%). Majority of the patients were between 5-8 years (62%). The most common aetiological factor was rhinosinusitis (36.7%) followed by hypertrophic adenoids (34.5%). All patients were initially given medical treatment. Out of 87 patients,30 patients (34.4%) improved and 57 patients (65.5%) had no response and underwent surgery. Surgical procedures included myringotomy with and without ventilation tube insertion, adenotonsillectomy and antral lavage. **Conclusion:**It is concluded from this study that conservative treatment has a definite role and should be tried before any surgical step is taken however surgery is the treatment of choice in more resistant cases.

Key Words: Secretory otitis media, otitis media with effusion, myringotomy

INTRODUCTION

Secretory otitis media (SOM) is defined as the presence of sterile fluid in the middle ear cleft[1].The term otitis media with effusion, non suppurative otitis media and glue ear are other name frequently used for SOM.[1,2] Its causes are multifactorial and results from alteration of mucociliary system of middle ear resulting mainly from eustachian tube dysfunction which may be primary or secondary to hypertrophic or infected adenoids, chronic tonsillitis, rhinosinusitis and allergy.[3,4,5.6] It was previously considered to be bacteriologically sterile. However positive bacterial cultures have been demonstrated in 40 percent of middle ear fluid. Streptococcus pneumoniae and haemophilus influenza account for the majority of cases.[7]

The highest incidence of SOM occurs in children between 4- 8 years and incidence decreases dramatically in those older than 6 years.[8] No significant difference exists between the sexes in terms of incidence or prevalence, although some findings suggest that males are more frequently effected than females.[9] The prevalence of SOM is higher in Native Americans particularly Navajo and Eskimo people than in other races. The reason for the higher frequency in these populations may be due to anatomic differences of skull base and eustachian tube, biologic susceptibility and difference in socioeconomic status[10]. Furthermore, several risk factors have been associated with SOM i.e previous acute otitis media, hereditary, parental smoking, attending day care centres, bottle feeding and autumn season.[11,12] Diagnosis can be made by careful history, otoscopic examination and audiological evaluation. Hearing loss is the most common presenting symptom. As children cannot complain of hearing loss, diagnosis is delayed for months or years, resulting in impairment of speech, inattention, poor performance at school and also behavioral problems.[13,14] Adults complain of deafness, heaviness in ear and tinnitus. The signs are dull tympanic membrane with dilated radial vessels, some times air fluid level or bubbles may be noticed. Otological assessment indicates conductive hearing loss and impaired tympanic membrane mobility. Diagnosis may be confirmed by pure tone audiogram if possible. Middle ear impedence measurement are mandatory for the diagnosis, a type B curve is the commonest finding. Untreated SOM may complicate in the form of atelectatic tympanic membrane, adhesive otitis media, tympano/myringosclerosis and ossicular ankylosis leading sometimes to cholesteatoma formation.[15]

The treatment varies and depends on duration, severity and underlying predisposing factors. Mild forms of SOM resolve spontaneously and need observation and follow up. Persistant disease with symptom need to be treated adequately to prevent complications as well as allow normal speech development and performance. Initially conservative treatment should be given. If the condition persists, surgery should be considered.

The objectives of the study were to determine most affected age group, the common etiological factors, to access the efficacy of medical and surgical treatment and finally to find out the complication associated with the surgical procedures.

MATERIAL AND METHODS

This study was carried out in department of ENT Head & Neck Surgery, Ayub Teaching Hospital, Abbottabad from January-2001 to December 2003. Eighty-Seven patients suffering from secretory otitis media were included in the study. A standard proforma was designed in which all particulars of patients and follow up were documented.

Patients in whom SOM was suspected were properly evaluated. After detailed history clinical examination, routine investigations and special investigation such as pure tone audiometry and tympanometry were carried out. All patients were given medical treatment. Medical treatment included systemic antibiotics, decongestants, antihistamine upto 2 weeks and treatment of allergy. All the patients were reviewed at the end of the month and were evaluated by otoscopic examination and hearing tests. Those improved with medical treatment were given a follow up appointment after four weeks and surgery was advised if the condition persisted for longer than 3 months. Follow up of patient was carried out from 18-24 months and during follow up the results of therapy and complications of treatment were studied.

RESULTS

Total 87 patients suffering from secretory otitis media were studied, 58 males (66.6%), 29 females (33.3 %) with an age range from 2-40 years. Majority of the patients were between 5-8 years (62 %) (table1). Most of the patients were from poor families (51.7 %), 30 patients (34.5%) from middle class and 12 patients (13.8%) were from rich class. The most common aetiological factor was rhinosinusitis (36.8 %) followed by hypertrophic adenoids in (34.5%). (table-2)

To see the effectiveness of medical and different surgical procedures, all patients were given medical treatment. Out of 87 patients, 30 patients (34.5%) improved with medical treatment and 57 patients (65.5%) had no response. and were subjected to surgery. (Table-3) Depending on the underlying predisposing factor, patients were divided into different groups for surgical procedures (table-4). All these 57 patients were suffering from bilateral SOM. Out of 114 ears, 99 ears (86.8%) contained thick mucoid fluid and 15 ears (13%) contained thin serous fluid. Myringotomy alone was performed on patients having no obvious predisposing factors and where the fluid was thin serous. Only 7 patients (12.3%) under went myringotomy alone. Where effusion was thick mucoid and present in large quantity, ventilation tubes were inserted. 17 patients (29.8%) underwent myringotomy with ventilation tube insertion along with adenoidectomy in 10 patients (17.5%), adenotonsillectomy in 12 patients (21%) and antral lavage in 3 patients (5.3%). Patients were followed up at 1, 3, 6, 12, 18 and 24 months. The criteria for cure was absence of fluid with normal tympanic membrane clinically and an audiogram showing less than 20d/b hearing loss. Recurrence was found in 42.8% patients who had myringotomy alone, in 25% patients who had adenoidectomy with myringotomy and no recurrence with other procedures. Common complications include infection, which occurred in 7 ears (6.1%) and tympanosclerosis in 6 ears (5.3%). (table 5)

Table-1: Age and sex wise frequency of Secretory Otitis Media. (n=87)

Age / Sex	2-4 Years	5-8 years	9-12 years	13-16 years	Above
Male	6	38	8	5	1
Female	3	16	5	2	3
Total	9 (10.34%)	54 (62%)	13 (14.94%)	7 (8.04%)	4 (4.59%)

Table-2: Aetiology of Secretory Otitis Media (n=87)

Aetiology	No	%
Rhinosinusitis	32	36.8
Hypertrophic adenoids	30	34.5
Chronic Tonsilitis	12	13.8
Nasal Allergy	08	9.2
Idiopathic	05	5.5

Table-3: Medical Treatment of Secretory Otitis Media (N=87)

Total No. of Patients	87	100%
Sucessful Medical Treatment	30	34.5%
Failed Medical Treatment	57	65.6%

DISCUSSION

Secretory otitis media is a common childhood problem and also occurs though less frequently in adults. Majority of the patients were between 5-8 years (62 %). While William et al reported that SOM is more common in five years old with an annual

prevalence of 17% compared to 6 % in eight years old[16]. Hogan et al reported prevalence of about 15% during their first 3 year of life[17]and its prevalence decreases with age thus at screening of school children 8-13 years, only1-5% were found to have SOM[18]. Our study included patients from all socio economic groups. Most of the patients belonged to poor families (51.72 %). The reason may be malnutrition; overcrowding and unhygienic personal habits contribute to high susceptibility to secretory otitis media. Some studies reported no relation ship between socioeconomic status and secretory otitis media. While others have reported that SOM is more common in lower socioeconomic classes.[10]

Table-4: Surgical Procedures Performed for secretory otitis media (n=57)

Procedure	No	%
Myringotomy alone	07	12.3
Ventilation tube Insertion	17	29.8
Adenoidectomy+Myringotomy	8	14
Adenoidectomy+Ventilation tube	10	17.5
Adenotonsillectomy +Ventilation tube	12	21
Antral Lavage+ ventilation tube	03	5.3

Table-5: Postoperative Complications After Surgical Procedures (n=114 ears)

Complications	No. of Ears	%
Infection	07	6.1
Tympanosclerosis	06	5.3
Persistent Perforation of Tympanic membrane	03	2.6
Loss of ventilation tube in middle ear cavity	01	0.9

The main aetiological factors are rhinosinusitis, hypertrophic adenoids and rarely chronic tonsillitis, and nasal allergy.[19, 20,21] The management varies depending on duration and underlying predisposing factor. Medical treatment was given to all patients. Out of 87 patients, 30 patients (34.5%) improved. Shahedin et al reported 33% clearance rate for the conservative group.[22] Studies carried out by other authors have shown that resolution of middle ear effusion was significantly more likely in the patients treated with antibiotics than in those treated with placebo or those receiving no treatment.[23, 24]

When effusion persisted for more than 3 months despite appropriate medical therapy or other predisposing factors were present such as hypertrophic adenoid, chronic tonsillitis and chronic sinusits, surgery was done. Patients were divided into different groups for surgical procedures.

Those patients who underwent myringotomy alone showed immediate improvement in hearing but for short duration as the myringotomy incision heals rapidly so it showed a high recurrence rate i.e. 3 patients (42.8%) while those patients who underwent ventilation tubes insertion showed improvement in hearing with no recurrence in any case. Similar results are also reported by other authors.[22] Those patients who underwent adenoidectomy with myringotomy alone resulted in significant improvement in upper respiratory infection and low incidence of recurrence i.e. 2 patients (25%) as compared to group-I. While those patients who had adenoidectomy or adenotonsillectomy with ventilation tube insertion showed similar results with no recurrence in any case. So ventilation tube gave additional benefit to that caused by adenoidectomy with myringotomy alone. The benefit of adenoidectomy could be due to reduction of the bacterial reservoir of the nasopharynx and it also relieves obstruction of the nasopharyngeal end of eustachian tube leading to better ventilation of the middle ear. The beneficial effect of tonsillectomy could be due to reduction of ascending infection. Coyle et al also concluded that adenoidectomy is a useful procedure for correction of medically resistant chronic SOM and should be considered as the first line procedure when surgical treatment is chosen[25] while a number of studies have shown no beneficial effect of Adenoidectomy.[26]

Myringotomy with ventilation tube insertion for SOM is the commonest procedure in children in the United Kingdom and many other countries [27]. There has been much discussion of this surgery, its efficacy and complications. It is effective in clearing effusion in middle ear and in restoring hearing. The ventilation tube have their own complications but they are minor and not too common. Complication includes infection, tympanosclerosis, persistent perforation and medial displacement of ventilation tube in middle ear.

Infection of the middle ear resulting in otorrhea occurred in 7 ears (6.1%) in which ventilation tubes were inserted. Five cases improved with frequent aspiration and cleaning o f ears plus topical antibiotic ear drops and oral antibiotic while two ears continued to drain chronically despite therapy so ventilation tube were removed. Talman et al reported otorrhea in 6.6%[28] while Hern et al reported otorrhea in 18% of the cases.[29]

Tympanosclerosis is thought to be the result of degeneration of the middle fibrous layer of the tympanic membrane. Tympanosclerosis was found in 6 ears (5.3%). The incidence of tympanosclerosis increases with the length of the follow up. Riley et al noted tympanosclerosis in 40%. [30]

Persistent perforation was observed in 3 ears (2.6)% in which ventilation tubes were inserted. However, they closed after 18 months. While Reley

et al reported perforation in 4.3% of the ears [30] and Levine et al in 5%.[31] Le et al also reported that perforation was more common in ears with ventilation tube than ear subjected to myringotomy alone.[32]

In one ear, a ventilation tube fell into the middle ear and became trapped when tympanic membrane healed over it.Repeat myringotomy was done and tube was removed. While Kumar reported medial displacement of tube in 3 cases. [33]

CONCLUSION

It is concluded from this study that medical treatment should be tried before any surgical step is taken. If the condition persists and is associated with bilateral hearing loss than surgery in form of myringotomy with ventilation tube should be inserted and if indication present than adenoidectomy, tonsillectomy and antral lavage should be recommended at the same time.

REFERENCES

1. Goycoolea MV, Hueb MM, Ruach C. Definations and terminology of otitis media. Otolaryngologic clinics of North America 1991; 24:757– 61.
2. Jalisi M, Jazbi B. Chronic middle ear effusion. Current problems in otorhinolaryngology. Pakistan Doctors Publication 1991; 85-97.
3. Abdou M, Adenoids and chronic secretory otitis media. Pakistan J Otolaryngol 1991;7:134 – 37.
4. Talat AM, Gomma k, Baghat Y, Elwany S, Abdou M. Adenoids and chronic secretory otitis media. Pakistan J Otolaryngol 1991;7:194-7
5. Finkelstein Y, Talmi YP, Rubel Y, Bar Ziv J. Otitis media with effusion as a presenting symptom of chronic sinusitis. J.laryngol otol 1989;103: 827-832.
6. Yaginuma Y, Kobayashi J, Takasaka T. The habit of sniffing in nasal Diseases as causes of secretory otitis media. Ann J Otol 1996; 17 (1): 108 -10.
7. Sriwardhana KB, Howard AJ, Dunkim KT. Bacteriology of otitis Media with effusion. J laryngol otol 1989;103:253-6.
8. TOS.M Etiology and prevalence of secretory otitis media. Ann of otol Rhinol – laryngol 1990;146 (99) 5-27.
9. Paradise JL, Rockette HE, Colborn DK, Bernard BS, Smith CG, Kurs-Laskym M, et al. Otitis media in 2253 Pittsburgh-area infants;prevalence and risk factors during the first two years of life. Pediatrics 1997; 99:318-33
10. Chan KH, Swarts JD, Rudoy R, Dever GJ, Yuji M. Otitis media in the republic of palau. Arch otolaryngol. Head Neck Surg 1993; 119:425-28
11. Daly KA. Epidemiology of otitis media. Otolaryngologic clinics of North America 1991; 24: 775– 82.
12. Ahlo OP, Oja H, Koivu M, Sorri M. Risk factors for chronic otitis media with effusion in infancy, each acute Otitis media episode induces a high but transient risk.Arch Otolaryngol Head Neck Surg 1995; 121:839-43.
13. Bennet KE, Hoggard MP, Silva PA, Steward IA. Behaviour and developmental effects of otitis media with effusion into the teens. Arch Dis Child 2001; 85: 91-5
14. Augustsson I, Engstrand I. Otitis media academic achievement int.J. Paediatric Otorhinolaryngol 2001;57:31-40.
15. Padgham N, Mills R, Chistmas H. Has the increasing use of grommets Influenced the frequency of surgery for cholesteasftoma J. of laryngol and otol 1989;103:1034-5.
16. Williamson JG, Dunleavey J, Robinson BA. A natural history of otitis Media with effusion. J Laryngol & otol 1994; 108: 930 -34.
17. Hogon SC, Stratford KJ, Moore DR. Duration and recurrence of oitis media With effusion in children from birth to 3 year, prospective study using Monthly otoscopy and tympanometry. B M J 1997; 314-350.
18. Midgley EJ, Dewey C, Pryeek, Maw AR, ALSPAC study team. The Frequency of otitis media with effusion in British pre School children a guid for treatment. Clinical otolaryngol 2000;25:485-91.
19. Gates GA. Adenoidectomy for secretory otitis media with effusion Ann otol – rhinolaryngol 1994; 103: 54 – 57.
20. Saeed M, Ajmal M, Secretory otitis media in adults. Pakistan. J otolaryngology 2003; 19:38-40
21. Bernstein JM. Role of allergy in Eustachian tube blockage and otitis media with effusion: A review Otolaryngol-Head-Neck-Surg 1996;114(4):562-68.
22. Shahedin , Raza A , Khan N S, Sattar F, Jan A. Management of secretory otitis media in children JPMI 2005:19 ((01): 106-110.
23. Rosenfeld RM. Post JC. Meta analysis of antibiotics for the treatment of otitis media with effusion 1992; 106: 378-386.
24. Williams RL, Chalmers, TC, Stange, RC, Chalmer T, Browlins SJ. Use of Antibiotics in preventing recurrent acute otitis media & in treating otitis media with effusion a Meta analytic attempt to resolve the brouhaha. J of American medical association 1993; 270 (11) 1344 – 51.
25. Coyle PC. Croxford R, MC Isaac W, Feldman W, Friedberg J. The role of Adjuvant Adenoidectomy & tonsillectomy in the out of the insertion of tympanostomy tube N Engl J. Med 2004; 344: 1188 – 95.
26. Ryding M, White P, Kalm O, Course & longterm outcome of Refractory Secretory Otitis Media J Laryngol otol 2005;119: 113 – 118.
27. Isaacs D. The management of otitis media with effusion. Current options in paediatrics 1994; 6: 3-6.
28. Talmon Y, Gadman H , Samet A, Gilbey P, Letichevsky V. Ventilation with self manufactured polyethylene T tubes for the treatment of children with middle ear effusion. J Laryngol otol 2001; 115 :699 – 703.
29. Hern JD, Hasnie A, Shah NS, A long term review of the shah pavmavent tube. J laryngol otol. 1995; 109: 277 – 80.
30. Riley DN, Herberger S, Mc Bride G, Law K. Myringotomy & ventilation tube Insertion. J of laryngol otol 1997; 111: 257-61.
31. Le CT, Freeman DW, Fireman B1, Evaluation of ventilating tubes and Myringotomy in the treatment of recurrent or persistent otitis media . J.Paediatric infections diseases 1991; 10: 2-1.
32. Levine S, Daly K, Giebink GS. Tympanic membrane perforation and tympanostomy tubes. Ann otol Rhinol laryngol 1994; 103: 27 – 30.
33. Kumar M, Khan MA, Davis S. Medial displacement of grommets an unusual sequel of grommet insertion. J laryngol & otol. 2000;114: 448 – 449.

Address for correspondence:
Dr. Farida Khan, Department of ENT, Ayub Medical College, Abbottabad