International Journal of Otorhinolaryngology and Head and Neck Surgery
Khilnani AK et al. Int J Otorhinolaryngol Head Neck Surg. 2017 Jul;3(3):715-720
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937

Original Research Article

DOI: http://dx.doi.org/10.18203/issn.2454-5929.ijohns20173053

Study of clinical and demographic profile of patients diagnosed with secretory otitis media

Ajeet Kumar Khilnani[1], Viral Prajapati[2]*

Department of Otorhinolaryngology, [1]Gujarat Adani Institute of Medical Sciences and GK General Hospital, Bhuj, Kachchh, [2]GMERS Medical College and Hospital, Dharpur-Patan, Gujarat, India

Received: 22 May 2017
Revised: 11 June 2017
Accepted: 12 June 2017

***Correspondence:**
Dr. Viral Prajapati,
E-mail: drviralmsent2009@gmail.com

ABSTRACT

Background: Secretory Otitis Media (SOM) is a common otological condition in children presenting most commonly with hearing loss. If untreated for long time, it can affect the language development of child. Its causes are multifactorial and treatment depends on the etiology. Various treatment modalities (medical and surgical) are available and they are administered in isolation or in combination. The objectives of the study were the present study was conducted with the objectives of knowing the most common age group affected by SOM, the common etiological factors of SOM and the outcome of various modalities of treatment of SOM.
Methods: This prospective study was conducted at a tertiary care teaching hospital of North Gujarat. IEC approval and consent from the patients were taken. 40 patients diagnosed with SOM were included in the study and their clinical and demographic details and treatment outcomes were studied.
Results: Of the 40 patients, 65% were males. SOM was common in young children. Most of the cases (55%) were below 10 years of age. In 80% of cases SOM was bilateral. Deafness was the most common symptom (95%) with which patients presented with, followed by URTI and pain. All patients had impaired tympanic membrane mobility. Retraction of tympanic membrane was the next common otoscopic finding (85%). Initial management was medical and 18 patients required surgical intervention.
Conclusions: SOM is a common ear disorder in children. Initial medical treatment has a definitive role and should be tried in all cases before surgical intervention is contemplated. A variety of surgical procedures are available which can be used depending on the indication. Complete recovery is expected to occur in most of the cases by a period of 3-6 months.

Keywords: Glue ear, Non suppurative otitis media, Otitis media, Otitis media with effusion, Secretory otitis media, Serous otitis media

INTRODUCTION

Secretory otitis media (SOM), also known as non suppurative otitis media, otitis media with effusion and glue ear, is a common otological manifestation in children, that most of the time is left undiagnosed on account of unawareness and negligence in seeking early medical attention for trivial ailments. If 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.[1] Its causes are multifactorial and results from alteration of mucociliary system of middle ear resulting mainly from Eustachian tube dysfunction which maybe primary or

secondary to hypertrophic or infected adenoids, chronic tonsillitis, rhinosinusitis and allergy.

The treatment varies and depends on duration, severity and underlying predisposing factors. Mild forms of SOM resolve spontaneously and need observation and follow up. Persistent disease with symptoms needs to be treated adequately to prevent complications and allow normal speech development and performance.[2]

Since the prevalence of the disease varies from place to place and many etiologies have been suggested, it was felt pertinent to conduct the present study with the following aims and objectives.

Aims and objectives

The following are the aims and objectives of study:

1. To determine the most affected age group.
2. To determine the common etiological factors.
3. To assess the efficacy of medical and surgical treatment.
4. To compare the efficacy of myringotomy with or without grommet insertion with tonsillo-adenoidectomy with or without grommet insertion.
5. To find out the complications associated with the surgical procedures.

METHODS

The present study was conducted in the Department of ENT and Head and Neck Surgery of a tertiary care teaching hospital of North Gujarat after getting the IEC approval. Cases attending ENT OPD from August 2015 to September 2016 were included. The cases were selected randomly on the basis of preset criteria of inclusion.

Criteria of inclusions were:

1. Fullness and/or pain in one or both ears
2. Decreased hearing in one or both ears

The following categories of the cases were excluded:

1. Associated medical illness such as active tuberculosis, diabetes and severe hypertension.
2. Pregnant and lactating mothers.
3. Unwilling patients and those who were unable to return for follow up.

Diagnostic evaluation

A detailed history was taken with particular emphasis on the onset, duration and severity of the symptoms. History of associated allergies, trauma and family history of such illness was taken. Clinical examination included external and otoscopic ear examination, anterior rhinoscopy, and examination of throat. Pure Tone Audiogram (PTA) with impedance audiometry was done for all cases. Cases with conductive hearing loss and impedance showing fluid in the middle ear were selected for management and followed up for 6 months.

Medical management was invariably the initial mode of therapy. It included use of antibiotics, nasal and oral decongestants (pseudoephedrine, 30-60 mg TDS, Xylometazoline 0.05% - 0.1% nasal drops), anti-inflammatory analgesics in the form of ibuprofen with or without paracetamol and ambroxol (15 mg TDS). Patients were followed for 3 months and depending on the improvement, surgical treatment was contemplated. The surgical therapy included procedures as myringotomy with or without grommet insertion, tonsillo-adenoid resection and adenoidectomy. They were followed for six months and a repeat PTA with impedance was done.

Final assessment was done at the end of six months of therapy and outcomes were assessed in following manners:

(a) Complete resolution of symptoms and abatement of signs and return of PTA with impedance within normal limits.

(b) Incomplete resolution-The data so collected was finally tabulated in Microsoft Excel sheet for descriptive statistical analysis (Mean, Percentage), which is mentioned in observations and discussion.

RESULTS

In the present series detailed study of 40 cases of SOM was done. Out of 40 cases one patient was lost to follow up. Thus 39 patients completed the study for 6 months. The age and sex distribution of these cases is shown in Table 1.

Table 1: Age and sex distribution of patients.

Age range (years)	Male N (%)	Female N (%)
1 – 5	8 (20)	2 (5)
5 – 10	8 (20)	4 (10)
10 – 15	5 (12.5)	5 (12.5)
>15	5 (12.5)*	3 (7.5)
Total	26 (65)	14 (35)

*Down's syndrome in one patient

Table 1 show that prevalence of SOM is 65% and 35% in males and females respectively. SOM appears to be common in young children. Most of the cases (55%) were below 10 years of age. Only 20% patients were above 15 years.

In 80% of cases SOM was bilateral, whereas right sided disease was seen in 12.5% of patients (Table 2).

In 10 out of 40 cases there was a history of allergy of which dust allergy was present in 5, pollen in 3, and pets in remaining 2 cases (Table 3).

Table 2: Involvement of ear

	Bilateral N (%)	Unilateral	
		Right ear N (%)	Left ear N (%)
	32 (80)	5 (12.5)	3 (7.5)
Total (%)	80	20	

Table 3: Distribution of patients according to associated symptoms.

	Male N (%)	Female N (%)
Association with nasal symptoms	15 (37.5)	5 (12.5)
Association with throat symptoms	15 (37.5)	9 (22.5)
Association with allergy	7 (17.5)	3 (7.5)

Table 4: Distribution of cases according to clinical presentation (symptoms).

Symptoms	Number (N)	Percentage (%)
Deafness	38	95
Pain	20	50
Fullness	8	20
Foreign body sensation	8	20
Upper respiratory tract infection (URTI)	24	60
Tinnitus	4	10
Neck swelling	1	2.5

As is evident from Table 4, deafness was the most common symptom with which patients presented with, followed by URTI and pain.One patient presented with bilateral neck swelling and biopsy showed well differentiated squamous cell carcinoma and was excluded from the study.

As is evident from Table 5, all patients had impaired tympanic membrane mobility. Retraction of tympanic membrane was the next common otoscopic finding (85%).

Surgical outcome

Complete resolution of symptoms occurred in 16 patients after 6 months of follow up.

*In one case, iatrogenic perforation of tympanic membrane (due to grommet) occurred, requiring tympanoplasty later.

**In one case, early extrusion of grommet (1 month) occurred, requiring reinsertion.

Criteria of cure

Patient was considered cured when;

A. There was abatement of symptoms
B. Improvement in hearing threshold as evident by PTA

Table 5: Distribution of patients according to the otoscopic findings.

Parameter	Number of cases	Percentage (%)
Color of tympanic membrane		
Dull	13	32.5
Yellow	14	35
Amber colored	13	32.5
Retraction	34	85
Bulging	6	15
Air bubble	9	22.5
Impaired mobility	40	100

Table-6: Comparison of pre and post treatment hearing thresholds

Average db loss #	Pre treatment cases N (%)	Post treatment cases N (%)
0-10	0 (0)	34 (87.17)
11-15	0 (0)	2 (05.12)
16-20	13 (32.50)	1 (02.56)
21-25	12 (30.00)	1 (02.56)
26-30	9 (22.50)	1 (02.56)
31-35	2 (05.00)	0 (0)
36-40	3 (07.50)	0 (0)
41-45	1 (02.50)	0 (0)

#average of 250, 500, 1000 and 2000 Hz

Table 6 shows the pre and post treatment audiological findings, suggesting that 34 patients had hearing loss less than 10 db after 6 months. No patient had a loss greater than 30 db after 6 months.

Table 7: Comparison of pre and post treatment impedance audiometry findings.

Type of curve	Pre treatment cases N (%)	Post treatment cases N (%)
A	4 (10)	32 (82.05)
B	28 (70)	4 (10.25)
C	8 20)	3 (07.69)

It is evident from Table 7 that type B curve is most frequently seen (70%) in pretreatment cases. Out of 28 patients having type B curve pre-treatment, 24 reverted to type A curve post-treatment.

DISCUSSION

The present study entitled 'Study of clinical and demographic profile of patients diagnosed with Secretory Otitis Media' was conducted on 40 randomly selected cases. Diagnosis was confirmed by history, clinical examination and audiometry.

In the present study, 80% patients were below the age of 15 years (Table 1). Therefore, SOM affects children more often than adults and mostly involves both ears (Table 2). The main determinants of the prevalence are the age of the child and the season of the year. Zielhius et al, found that the prevalence is bimodal, with the first and the largest peak at two years of age when many children first attend a playgroup or nursery school.[3] Thereafter the prevalence declines, but there is a second peak at five years of age when most children start attending a primary school. Engel et al, suggest that peak is likely to be around one year of age.[4] Williamson et al, showed that by the age of 7-8 years, the prevalence falls.[5] Thus SOM is common in children because of several factors reported so far.

The recurrent upper respiratory tract infection (URTI) is an important factor in etiology of SOM. In the present work, there was a history of associated throat symptoms in 55% of cases and associated nasal symptoms in 45% of patients (Table 3). Viruses have also been cultured from middle ear effusions.[6] Adenoids cause mechanical blockage of the Eustachian tube, and at the same time tubal patency is compromised by inflammatory edema due to ascending salpingitis arising from recurrent tonsil or adenoid infection

Seasonal variations in the prevalence of SOM have been reported. In the present study, 28 patients (70%) presented in winter months. Midgley et al reported that about twice as many children are diagnosed with SOM in the winter as opposed to summer months.[1] This difference could be due to many factors. The most likely are the increased incidence of upper respiratory and ear infections in winter and the greater chance of transmission of infection to other children because of the closer contact in cold weather.

Table 8: Review of otoscopic findings in previous studies.

Study	Otoscopy			
	Sensitivity (%)	Positive predictive value	Specificity (%)	Negative predictive value
Toner et al[13]	87	84	89	84
Finitzo et al[14]	93	84	58	78
Vaughan-Jones et al[15]	90	88	75	78
Nozza et al[16]	85	78	71	79

Table 9: Outcome of critical reviews on medical therapy of SOM.

Medical therapy	Beneficial	Not beneficial	Comment
Systematic steroids	Mendel et al[18]	-	Effective for short term
Antibiotics	Initial benefit for 2 weeks, Williams et al[19]	Williamson[20]	Longer (> 6 weeks) use discouraged
Nasal decongestants	Doubtful	Griffin et al[2]	Not recommended for childhood SOM
Mucolytics	Insufficient data	Commins et al[21]	

Table 10: Six month follow-up of surgical outcome in present study.

Procedure	Number of patients	Outcome			
		Duration of recovery (months)		Complications (months)	
		At 3 months	At 6 months	At 3 months	At 6 months
Myringotomy	7	7	7	-	-
Myringotomy with grommet	3	2	3	1	-
Adeno-tonsillectomy with myringotomy	6	4	6	-	-
Adeno-tonsillectomy with grommet	2	1	2	1	-

There appears to be a gender predilection of the occurrence of SOM. In the present work, there were 65% male patients. These findings are in accordance with those reported by Daly et al.[7] However, some multivariate studies report the risk of developing SOM to be equal in boys and girls, while Sassen et al, has reported a higher incidence in girls.[8,9] In present study, 10 patients (25%) had history of allergy to pollen, dust or

pets. While allergy is incriminated as one of the factors, it seems that it plays only a minor role because best evidence doesn't support allergy as a risk factor for the occurrence or persistence of SOM.

In the present study 16 patients (40%) gave history of inadequate or irregularly taken antibiotics for previous attacks of acute otitis media. Inadequate antibiotic therapy is an important cause of SOM.[10] Failure of antibiotic therapy may be the result of too short a prescribed course, poor patient compliance, inappropriate antibiotics, resistant organisms, and inadequate follow up.

In the present study (Table 4), the most common presentation of SOM is deafness (95%), followed by URTI (60%) and ear pain (50%). It is assumed that effusions present in the middle ear for a short duration are thin and produce a mild hearing loss, whereas effusions present for a longer duration are thick and produce greater hearing loss, although, Bluestone et al, found no difference in the hearing loss in ears with serous fluid as compared to those with mucoid fluid.[11] In the present study, no patient had sensorineural deafness. The consensus of opinion is that sensorineural deafness is not the characteristics feature of SOM, but there are sporadic reports of variable degree of sensorineural loss in patients with SOM.[12]

The otoscopic appearances of SOM are extremely varied. They are mainly the combinations of the retraction of tympanic membrane (pars tensa) and variations in its color. In the present study, impaired mobility was present in all patients (100%). Retraction of tympanic membrane was present in 34 patients (85%). The color of the membrane varied from dull (32.5%), yellow (35%), and amber colored (32.5%). Less common findings were, presence of air bubble (22.5%) and bulging (15%) (Table 5). In some children otoscopy was not possible initially because of wax, which had to be removed. All patients in the present study had pre and post treatment audiometry (PTA and tympanometry) done (Table 6 and 7). Tympanometry with an impedance meter has been advocated since the 1970s as a reliable method of detecting SOM. Type B tympanogram is frequently associated with SOM, type A is infrequently associated with SOM and type C falls in between.

Otoscopy has shown a sensitivity of 85% - 93% and specificity of 71% - 89% in various studies in diagnosing SOM (Table 8).

The sensitivity and specificity of tympanometry (type B curve) for the diagnosis of SOM is reported to be 55% - 90% and 50% -94% respectively.[17]

The management of SOM is medical and surgical. In present study, 37 patients were initially given medical treatment in the form of Valsalva maneuver, antibiotics, oral and nasal decongestants, mucolytics and oral steroids. Two patients were initially treated surgically (Septoplasty). After 3 months of follow up, 19 patients (51.35%) were cured and the rest (18 patients) were subjected to various surgical procedures. So, medical treatment remains initial treatment of choice for SOM. The effect of most medications has been systematically reviewed (Table 9). Those resistant to medical treatment require surgical intervention.

The surgical options for the management of SOM are myringotomy (with or without grommet insertion), myringotomy with adenoidectomy/tonsillectomy (with or without grommet), and bone anchoring hearing aids. In the present study (Table 10), myringotomy was done in 18 patients (in anteroinferior quadrant through radial incision). Out of these, 9 patients had whitish fluid, 7 had yellowish serous fluid and 2 had thick glue like fluid. Out of the 18 patients who underwent myringotomy, 5 required grommet insertion, (1 unilateral, 4 bilateral). In 1 patient there was permanent perforation of the tympanic membrane, which required tympanoplasty. It was observed that after myringotomy, patients had immediate improvement in hearing, but after the closure of perforation of myringotomy (after 2 months of extrusion of grommet), there was little benefit. So, myringotomy has proved more to be of diagnostic rather than therapeutic value. Myringotomy with grommet is a commonest procedure done in children. It is effective in clearing effusion in middle year and restoring hearing.

The surgical outcome of 18 cases and their follow-up of 6 months are depicted in the table above. Overall 2 patients showed complications in the form of perforation (1 patient) and early extrusion of grommet at 1 month (1 patient). Thus 16 out of 18 patients (88.9%) recovered without complications. Ventilation tubes give additional benefit to that caused by adenoidectomy or myringotomy alone. The ventilation tubes have their own complications but they are minor and not too common. Complications include infection, tympanosclerosis, persistent perforation and medial displacement of ventilation tube in middle ear. These findings are in accordance with those reported by Khan et al.[22] In their series adenoidectomy with myringotomy resulted in significant improvement in airway infections with low incidence of recurrence. Similarly, adeno-tonsillectomy with grommet was equally effective. The benefit of adenoidectomy could be due to reduction in the bacterial reservoir of nasopharynx, removal of obstruction from the nasopharyngeal end of Eustachian tube, and better ventilation of middle ear.

CONCLUSION

SOM is a common ear disorder in children. Initial medical treatment has a definitive role and should be tried in all cases before surgical intervention is contemplated. A variety of surgical procedures are available which can be used depending on the indication. Complete recovery is expected to occur in most of the cases by a period of 3-6 months.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Midgley EJ, Dewey C, Pryce K, Maw AR. The frequency of otitis media with effusion in British pre-school children: a guide for treatment. ALSPAC Study Team. Clin Otolaryngol Allied Sci. 2000;25(6):485-91.
2. Griffin GH, Flynn C, Bailey RE, Schultz JK. Antihistamines and/or decongestants for otitis media with effusion (OME) in children. Cochrane Database Syst Rev. 2006;(4):CD003423.
3. Zielhuis GA, Heuvelmans-Heinen EW, Rach GH, van den Broek P. Environmental risk factors for otitis media with effusion in preschool children. Scand J Prim Health Care. 1989;7(1):33-8.
4. Engel JAM, Anteunis LJC, Volvics A, Hendriks J, Manni JJ.Chronic otitis media with effusion during infancy, have parent-reported symptoms prognostic value? A prospective longitudinal study from 0 to 2 years of age. Clinical Otolaryngol. 1999;24(5):417-23.
5. Williamson IG, Dunleavey IG, Bain IG, Robinson IG. The natural history of otitis media with effusion – A three year study of the incidence and prevalence of abnormal tympanograms in four South West Hampshire infant and first schools. J Laryngology otology. 1994;108;930-4.
6. Kubba H, Pearson JP, Birchall JP. The aetiology of otitis media with effusion: a review. Clin Otolaryngol. 2000;25:181-94.
7. Daly KA, Rich SS, Levine S, Margolis RH, Le CT, Lindgren B, et al. The family study of otitis media: Design and disease and risk factor profiles. Genetic Epidemiol. 1996;13(5):451-68.
8. Rovers MM, Hofstad EAH, Franken-Van Den Brand KIM, Straatman H, Ingles k, Van Der Wilt GJ et al. Prognostic factors for otitis media with effusion. Clin Otolaryngol. 1998;23(6):543-6.
9. Sassen ML, Brand H, Grote JJ. Risk Factors for Otitis Media with Effusion in Children 0 to 2 Years of Age. American J Otolaryngol. 1997;18:324-330.
10. Qureishi A, Lee Y, Belfield K, Birchall JP, Daniel M. Update on otitis media – prevention and treatment. Infection and Drug Resistance. 2014;7:15-24.
11. Bluestone CD, Beery QC, Paradise JL. Audiometry and tympanometry in relation to middle ear effusions in children. Laryngoscope. 1973;83(4):594-604.
12. Löppönen H, Sorri M, Pekkala R, Penna J. Secretory otitis media and high-frequency hearing loss. Acta Otolaryngol Suppl. 1992;493:99-107.
13. Toner JG, Mains B. Pneumatic otoscopy and tympanometry in the detection of middle ear effusion. Clin Otolaryngol Allied Sci. 1990;15(2):121-3.
14. Finitzo T, Friel-Patti S, Chinn K, Brown O. Tympanometry and otoscopy prior to myringotomy: issues in diagnosis of otitis media. Int J Pediatr Otorhinolaryngol. 1992;24(2):101-10.
15. Vaughan-Jones R, Mills RP. The Welch Allyn Audioscope and Microtymp: their accuracy and that of pneumatic otoscopy, tympanometry and pure tone audiometry as predictors of otitis media with effusion. J Laryngol Otol. 1992;106(7):600-2.
16. Nozza RJ, Bluestone CD, Kardatzke D, Bachman R. Identification of middle ear effusion by aural acoustic admittance and otoscopy. Ear Hear. 1994;15(4):310-23.
17. Jerger J. Clinical experience with impedance audiometry. Arch Otolaryngol. 1970;92(4):311-24.
18. Mandel EM, Casselbrant ML, Rockette HE, Fireman P, Kurs-Lasky M, Bluestone CD. Systemic steroid for chronic otitis media with effusion in children. Pediatrics. 2002;110(6):1071-80.
19. Williams RL, Chalmers TC, Stange KC, Chalmers FT, Bowlin SJ. Use of antibiotics in preventing recurrent acute otitis media and in treating otitis media with effusion. A meta-analytic attempt to resolve the brouhaha. JAMA. 199315;270(11):1344-51.
20. Williamson I. Otitis media with effusion. Clin Evid. 2006;(15):814-21.
21. Commins DJ, Koay BC, Bates GJ, Moore RA, Sleeman K, Mitchell B, Bates S. The role of Mucodyne in reducing the need for surgery in patients with persistent otitis media with effusion. Clin Otolaryngol Allied Sci. 2000;25(4):274-9.
22. Khan F, Asif M, Farooqi GH, Shah SA, Sajid T, Ghani R. Management outcome of secretory otitis media. J Ayub Med Coll Abbottabad 2006;18(1):55-8.

Cite this article as: Khilnani AK, Prajapati V. Study of clinical and demographic profile of patients diagnosed with secretory otitis media. Int J Otorhinolaryngol Head Neck Surg 2017;3:715-20.