ORIGINAL ARTICLE

Tympanometry Findings before and after medical treatment in Secretory Otitis Media

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ABSTRACT

Aim: To determine the tympanometric findings and its improvement after medical treatment in patients with secretory otitis media.

Methods: This descriptive study was conducted in Department of ENT, Ayub Medical Institute Abbottabad from March to September 2013. A total of 40 patients with secretory otitis media were included in this study and medical treatment was given after tympanometry. Patients were followed up at 2nd and then 4th week.

Results: Among 40 patients, 27(67.5%) were completely recovered from the disease both clinically and on tympanometry while 13 patients (32.5%) did not improve.

Conclusion: It is concluded that tympanometry is diagnostic in secretory otitis media and Conservative treatment is effective in the management of Secretory otitis media. Tympanometry findings improves with conservative treatment in secretory otitis media.

Keywords: Secretory otitis media, Tympanometry, Conservative treatment

INTRODUCTION

Secretory otitis media is a presence of fluid in the middle ear cleft behind an intact tympanic membrane[1,2]. It is also called otitis media with effusion, serous otitis media, glue ear or non suppurative otitis media. Otitis media with effusion is the most important cause of deafness in children the world over[1,3]. The exact etiology of secretory otitis media is not known. It can result from different conditions like Eustachian tube dysfunction, enlarged adenoids, allergic rhinitis, maxillary sinusitis, upper respiratory tract infection etc[4]. An accurate diagnosis of secretary otitis media can be made by careful history, otoscopic examination and hearing tests like Tuning fork tests, audiogram and tympanogram[2,5]. Hearing loss is the most presenting symptom. Secretory otitis media is common the children with 20% prevalence at the age of 2 years and 15% at the age of 5 years and as hearing impairment is not noted in most of the children so the diagnosis of secretory otitis media in children is often delayed for months or years resulting in poor development of speech, language, cognition and behavior and poor performance at school[1,3,6]. It also results in chronic non specific pain or discomfort in the ear. So the early diagnosis and treatment of secretory otitis media is very important. It untreated; it can progress in to chronic infective stage also[6,7].

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Once the diagnosis of secretory otitis media is made then the patients is first given medical treatment for at least 3 months including Antibiotics, anti histamines, mucolytics and nasal decongestants.[3,4,8] If the condition doesn't settle after 3 months then surgical options should be considered like myringotomy and ventilation tube insertion. Complications of ventilation tube insertion include tympanosclerosis, atelectasis, residual perforations and rarely cholesteatoma formation.[3,7] Secretory otitis media accounts for 60% of surgical procedures in children under the age of 10 years in the ENT department of Britian.[8] Few patients don't need surgery or medical treatment. They just need observation and resolve spontaneously.[6,8] The rationale of the study was to observe the efficacy of conservative treatment and tympanometric improvements in the management of otitis media with effusion and justification of surgery in the indicated cases.

PATIENTS AND METHODS

This cross sectional study was conducted in the OPD of ENT Department of Ayub Medical Institute from March 2013 to September 2013. All patients who presented to OPD, meeting the inclusion criteria were randomly included in the study. The inclusion criteria were patients of any age and gender having secretory otitis media. Patients who had taken treatment already and those having congenital anomalies like cleft palate were excluded from the study. The diagnosis of secretory otitis media was made on the basis of detailed history, otoscopic

examination, tuning fork tests supported by audiological investigations like pure tone audiogram and tympanogram. The purpose and benefits of the study were explained to all patients and a written informed consent was obtained. After diagnosis all patients were treated conservatively using oral antibiotics (amoxicillin), nasal decongestants (xylometazoline) and mucolytics (Acetyl cystine) for 10 days, and antihistamine (clemastine) for 4 weeks. After 2 weeks treatment patients were assessed for any improvement in the symptoms, or otoscopic findings supported by tympanogram. Those patients still having some symptoms were given antihistamines for another 2 weeks and were reassessed.

Data was collected using a proforma designed for the purpose. The otoscopic examinations and audiological tests were conducted by an experienced audiologist in all cases. Data was stored and analyzed using SPSS version 11.

RESULTS

A total of 40 patients were included in the study. Results were compared and analyzed regarding age, sex, presenting symptoms, associated symptoms, otoscopic findings, audiological tests and treatment outcome. A total of 18 (45%) patients were 5-10 years age, 16 (40%) patients were below 5 years while 5 (12.5%) patients were above 15 years. There were 25 (62.5%) males and 15 (37.5%) females with male to female ratio of 1.6:1. The most common presenting complaint at the time of diagnosis was decrease hearing/ear blockage, followed by irritation, otalgia and delayed speech development. On otoscopy air fluid level was the commonest finding (60%) followed by increased vasculature, dullness and retraction of tympanic membrane. Bilateral ear involvement was common than unilateral. Tympanogram was done in all 40 patients and out of them 39 patients (97.5%) had flat type B curve while only one patient (2.5%) had type C curve (Table 1). At the end of 2nd week the efficacy of conservative treatment was observed in 27 patients (67.5%) while 13 had no improvement both clinically and on tympanometry. Out of 27 patients, 15 were fully recovered with no residual disease on otoscopy while the remaining 12 patients still had the residual disease with no otoscopic and tympanometric improvement, so they were again given the treatment for further 2 weeks. Type A curve was found in 15 patients (37.5%) and type B curve in 10 patients and type C in 2 patients on tympanometry at the end of 2nd week. Among these 12 patients, 11 patients (91.7%) were found to have recovered fully having type A curve on tympanometry at 4th week but one patient (8.3%) had residual disease on otoscopy having type B curve on tympanometry while 13 patients had no Otoscopic improvement and Type B curve was seen in these on tympanometry. So at the 4th week assessment 27 patients (65.5%) recovered completely with type A curve on tympanometry while 13 patients (32.5%) did not improve having type B curve on tympanometry (Table 2).

Table 1: Frequency of different variables at presentation

Variable	No.	%
Age (years)		
< 5	16	40.0
5 – 10	18	45.0
10 - 15	1	2.5
> 15	5	12.5
Ears affected		
Bilateral	37	92.5
Unilateral	3	7.5
Presenting symptoms		
Ear blockage	31	77.5
Irritation	21	52.5
Otalgia	15	37.5
Delayed speech	4	10.0
Otoscopic Findings		
Air fluid level	24	60.0
Increased vascularity	7	17.0
Dullness of TM	5	12.5
Retracted TM	3	7.5
Tympanogram		
Type B	39	97.5
Type C	1	2.5

Table 2: Treatment outcome and assessment at 2nd and 4th week (n = 40)

Improvement	Yes	No
Complete otoscopic improvement with no residual disease at 2nd week	15(37.5%)	12(30%)
Complete otoscopic improvement with no residual disease at 4th week	12(30%)	1(2.5%)
Total	27(67.5%)	13(32.5%)

DISCUSSION

In the literature the secretory otitis media is known by a variety of synonyms like middle ear effusion, serous otitis media, glue ears, chronic non suppurative otitis media, chronic otitis media with effusion and simply otitis media with effusion[1,3,9]. Acute otitis media and secretory otitis media are very common among children[3,10]. About 25% of all children with secretory otitis media are treated surgically and ventilation tubes are inserted through the tympanic membrane[7,11,12]. The surgical procedure requires general anesthesia and is distressing both for children and parents[3,11]. So effective pharmacological

treatment should be tried to minimize these problems.

In our study the mean age was 8.3 years. Similar results were reported in other studies that secretory otitis media is more common in five years old with an annual prevalence of 17% compared to 6% in eight years old, while another study reported that it is more frequent in children aged one to four years than in children aged 7 years and older[6,13].

The symptoms differ with the age of the patient. The most frequent presentation is hearing loss which fluctuates in severity particularly in relation to seasonal change and the presence or absence of infection.[6,14] The same was the case in our study with 77.5% of the patients being presented with deceased hearing/ blockage of ears. The second most common presenting symptom in our study was irritation in ears which was found in 52.5% of the patients while otalgia was observed in 15(37.5%) patients. Otalgia in secretory otitis media often occurs, usually as a result of secondary infection of fluid within the middle ear cleft and it invariably results from pathogenic bacteria within the nasopharynx which reaches the middle ear through the medial end of the eustachian tube[3,14]. Frequently it coincides with the minor respiratory tract infections and sometimes follows sinus infection and/or episode of allergic. In young children secretory otitis media may present as impaired language and school performance.[6,15] In our study 10% patients presented with poor or delayed speech development and this was the main reason for which they were being brought for opinion and secretory otitis media was diagnosed incidentally. It is important to mention here that all these patients had severe secretory otitis media, indicated by fluid level, air bubbles on car examination and confirmed by flat type B tympanogram. The main factors for the development of secretory otitis media are a combination of Eustachian tube dysfunction and infection[1,6,14]. There are a number of risk factors for Eustachian tube dysfunction, like structural abnormalities in nose, palate, postnasal space, infections, allergy and many others[7,14]. In our study 5 patients (12.5%) had gross DNS, 3 patients (7.5%) had symptoms of Allergic rhinitis and 3 patients (7.5%) gave history of nasal discharge only.

Otoscopy is a main stay of clinical diagnosis of secretory otitis media. Use of an operating microscope with magnification further improves the diagnostic accuracy. Values of 75% and 90% are reported for experience clinicians however there is considerable variation in the appearance of tympanic membrane[8,13,14]. The most confirmatory sign of secretory otitis media is fluid level or air bubble as seen on otoscope and this was found in 60% of our patients. Increased vascularization and increased malleolar vasculature also indicates the possibility of Secretory otitis media[6,7,14]. In our study 5 patients (12.5%) had loss of normal color of the tympanic membrane.

In our study the tuning fork tests could be done in 13 patients (32.5%) and in the rest it could not be done, because the response in very young children was very confusing. Out of these 13 patients the Rinne was found negative on both sides in 10 patients, and this finding was consistent with the otoscopic findings which showed that the patients had bilateral disease. In the remaining three patients, it was negative only on one side, and again this finding was consistent with the otoscopic findings. This showed that the patient had unilateral disease. Moreover the Weber in these 3 patients was also lateralizing to the affected side again indicating a conductive hearing loss.

Tympanogram has a vital role in the diagnosis of Secretory otitis media. Type B cure is highly sensitive in detecting secretory otitis media with a greater than 25 dB hearing loss, but is only 75% specific. Moreover 2% of children with bilateral hearing loss greater than 25 db do not have flat type B tympanogram.[7,16] In our study we did tympanogram in all 40 patients. The high rate of accuracy of Tympanogram in our studies is due to the fact that we died tympanogram only in those patients in whom the otoscopic/microscopic findings were highly suggestive of secretory otitis media and it was actually to confirm the clinical diagnosis.

Different drugs have been used to treat secretory otitis media and different studies have been done to see the efficacy of different drugs. It is also impotent to treat the co-existing conditions such as allergy, infections in nose and sinuses[8,16]. In our study we adopted a simple protocol to see the efficacy of medical treatment of Secretory otitis media. We gave Amoxicillin oral for 10 days, Clemastine for 4 weeks, Xylometazoline topical for 10 days and mucolytics, Acetyl cystine for 10 days. Several studies have been done to see the effect of different drugs in resolving the secretory otitis media. Rubenstein et al[17] reseated 462 episodes of secretory otitis media using several antimicrobial agents and the decongestant pseudoephedrine. It was seen that some improvement was due to the treatment with anti microbial agents but the addition of pseudoephedrine to the treatment regimen did not appear to improve results significantly. Olson and co-workers[18] have also studied the efficacy of pseudoephedrine hydrochloride by studying the response to the treatment of 96 children who had acute secretory otitis media which had not responded to the treatment for 2 weeks. However we cannot

comment on the efficacy of pseudoephedrine as we used the topical Xylometazoline.

CONCLUSION

The conclusion drawn from our study is that tympanometry findings improve with medical treatment in secretary otitis media and by using just the medical treatment one can successfully reduce the rate of surgical interventions.

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