AUDIOLOGICAL AND OTOLOGICAL DIAGNOSTIC FEATURES IN SECRETORY OTITIS MEDIA*

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Secretory Otitis Media occupies an unique place in otology and represents one of the most frequent and challenging problems for the Otologist today because of its cause and subtle manifestations of signs and symptoms both in children and adults.

Secretory otitis media is the most common cause of hearing loss in children. The hearing loss in chronic secretory otitis media (SOM) varies greatly but it is in most cases so great that it adversely affects the child's development and his progress in school.

A review of litereture indicates a lack of definite otologic signs and symptoms and audiometric pattern which could help an Audiologist and Otologist to diagnose this disease conditions.

The prevalence of SOM has led to attempts towards development of methods for early detection of the disease as well as for prevention of disease progression.

The value of Otoscopy as a method for diagnosis of middle ear disease is limited, however, it facilitates the diagnosis. Audiologically, SOM is invariably associated with conductive hearing loss. The amount of hearing loss may fluctuate but it will inevitably persist until the underlying cause is eliminated.

The present study attempted to establish definite diagnostic features in secretory otitis media.

METHODOLOGY

Instrumentation and Tests :

Audiometer :

A Calibrated (ANSI, 1969) dual channel diagnostic audiometer Madsen OB70, with TDH 39 earphone and MX-41/AR ear cushions were used to obtain the pure tone thresholds for AC & BC, SRT and Speech Discrimination.

Impedance Audiometer :

An electro-acoustic impedance bridge Madson Z0-72, with Telex-1470 earphone and MX-41/AR ear cushions were used to record the tympanogram, static compliance and stapedial reflex thresholds.

* Self Abstract

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Otomicroscope :

An operating microscope, Model Karl Zeiss of West Germany, was used for otomicroscopic examination of the ear.

Subjects :

Total 52 cases (99 ears) were included for the study from the out patient department of All India Institute of Speech and Hearing, Mysore.

Audiological testing for all the subjects was done by the investigator of this study and otological examination by an experienced otologist.

Results and discussions

Table 1 shows the age and sex distributions of SOM cases. The number of cases in different age groups show that the maximum number of cases 40.38% fell in the age group of 5-10 years. The sex distribution of the cases in this study show 75% male and 25% female with ratio of 3:1, which indicates that the SOM is more common in males than females.

Table 1 : Presents age and sex distribution of cases

Age group in years	Number of cases	Sex		% of cases
		Male	Female	
0— 5	4	4	—	7.69
5—10	21	15	6	40.38
10—15	11	8	3	21.15
15—20	3	3	—	5.76
20—25	5	3	2	9.61
25—30	8	6	2	15.38
0—30	52	39 (79%)	13 (25%)	100

Table 2 shows the distribution of cases according to the symptoms reported and presented at the time of taking case history.

Table 2 : Presents distribution of cases according to symptoms reported.

Symptoms	No. of cases	% of cases
Hearing loss	52	100 00
Pain in ear /ear ache	22	42.30
Sound in ear/Tinnitus	14	26.92
Cold/Upper respiratory infections	10	19.23
Fullness/blocking in ear	3	5.76

Table 3 shows the distribution of ears with SOM disease by clinical, otological and microscopic signs observed.

Table 3 : Presents distribution of ears according to the signs observed.

Signs of tympanic membrane	No. of ears	% of ears
Dull	99	100.00
Retraction with Prominent Malleolar fold, handle of Malleus and lateral process of Malleus	90	90.00
Waxy	34	34.34
Hair line	4	4.04
Air bubbles	2	2.02

Table 4 shows the mean and standard deviations of pure tone and speech audiometric findings for the total age group 0-30 years. The pure tone thresholds of the right ear ranged from 39.4 dB to 51.3 db with SD of 3.4 to 6.9. The pure tone thresholds of the left ear ranged from 4.5 dB to 10.7 dB with SD of 4.4 to 6.3. The PTA of right ears was 40.6 dB with SRT of 47.3 dB and of left ear was 42.8 dB with SRT of 46.7 dB. The PTA for speech frequencies of both ears show agreement with SRT. The speech discrimination scores of both ears were 95% with SD 2.2.

Table 4 : Presents Mean and Standard Deviation (SD) of pure tone and speech audiometric findings for total age group 0-30 years (N=52)

		Thresholds at different frequences in dB HL (ANSI - 1969)							Pure tone average (PTA)	Speech reception threshold (SRT)	Discrimination score (DS)
		250	500	1K	2K	4K	6K	8K			
R	Mean	41.3	42.1	41.8	39.4	47.5	51.3	48.4	40.6	47.3	95.1
	SD	3.8	3.7	4.6	4.7	6.9	4.8	3.4	3.2	4.9	2.2
L	Mean	47.0	46.4	42.9	38.8	43.8	46.8	45.9	42.8	46.7	95.3
	SD	6.6	5.2	4.5	5.7	5.1	5.2	5.9	4.6	6.2	2 2
Common B.C.	Mean	7.1	4.8	4.5	8.1	10.7	—	—	—	—	—
	SD	4.4	6.3	4.9	4.5	5.9	—	—	—	—	—

The audiometric pattern for AC and BC are shown in the figure 1. The AC curve of both ears show very little differences in their thresholds. The AC curve of mean values and SD of both ears show almost flat pattern. The BC curve of mean values show normal bone conduction hearing with slight depression at 4KHz, which might be due to the fluid filled in the

tympanic cavity, which disturbs the asynchronized movement of round window and oval window of the cochlea.

FIG 1 MEAN AND SD OF AIR CONDUCTION AND BONE CONDUCTION PATTERN, AGE GROUP 0-10 YEARS (N=52).

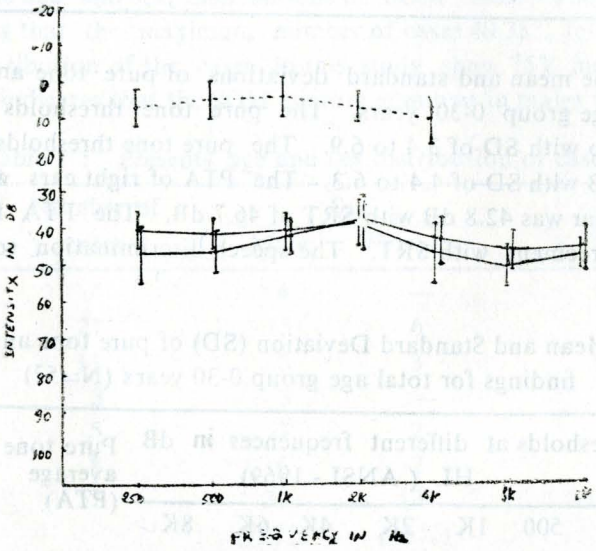


Table 5 presents the distribution of ears with SOM according to type of tympanograms and static compliance ranges observed. Since stapedial acoustic reflexes were absent in all the ears for all the test frequencies, it is not shown in table. The maximum number of ears 82% presented type 'B' tympanogram, which indicated that the type 'B' tympanogram was more significant in cases of SOM. The maximum number of ears 76% were found to have static compliance between 0.10 cc to 0.2 cc indicating the more viscous middle ear system.

Table 5 : Presents distribution of ears according to type of tympanograms and static compliance value.

	No. of ears	% of ears
Type of Tympanograms		
Type 'A'	1	1.01
Type 'B'	81	81.82
Type 'C'	10	10.10
Type 'As'	7	7.07
Compliance range		
0.10–0.20 cc	76	76.77
0.20–0.30 cc	19	19.19
0.30 +	4	4.04

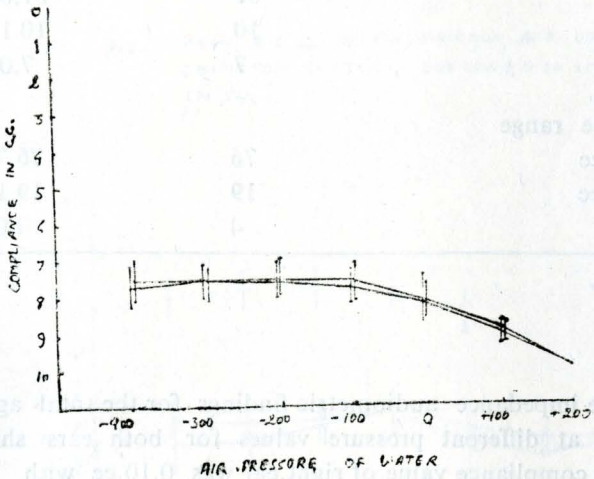
Table 6 shows the impedance audiometric findings for the total age group of 0-30 years. The compliance values at different pressure values for both ears show a small gradient value. The mean static compliance value of right ear was 0.10 cc with SD of 0.02 and of left ear was 0.16 cc with SD of 0.02. The acoustic reflex was absent in all the ears. The tympanometric pattern is shown in the figure 2. The tympanogram of both ear shows a typical 'B' type of tympanogram.

Table 6 : Presents Mean and SD of the Impedance Audiometric findings for the total age group 0-30 years (N=52)

		Compliance at different pressures mm H_2O in cc							Static	Acoustic
		200	100	0	-100	-200	-300	-400	pliance cc	Reflexes
R	Mean	10.0	0.06	8.29	7.82	7.63	7.65	7.68	0 17	A*
	SD	0	0.21	0.51	0.37	0.37	0.40	0.49	0.02	—
L	Mean	10.0	8.98	8.23	7.64	7.63	7.55	7.55	0.16	A
	SD	0	0.04	0.27	0.36	0.37	0.44	0.34	0.02	—

*A =Absent.

FIG - 2. MEAN AND SD OF THE TYMPANOMETRIC FINDINGS. AGE GROUP 0-30 YEARS (N=52)



The pure tone audiometric and impedance audometric investigations were also done for the different age groups of cases with SOM to find out the changes in audiometric feature according to the age variation and disease progression.

The audiological and otological findings obtained in this study can be used as an objective means to diagnose the SOM cases, clinically by otologist and audiologist. It was hoped that these features would be increasingly helpful in the differential diagnosis of SOM from other similar ear diseases particularly in children.

Recommendations :

Subjects of Post operative or post medical treatment can be taken for same investigations to correlate the pretreatment results for better understanding of the disease process.