



Original Research Article

Comparing audiological and radiological contralateral ear findings with the type of chronic suppurative otitis media (CSOM): Results from a tertiary care centre of Gwalior

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ABSTRACT

Background : The contralateral ear (CLE) is defined as the asymptomatic ear in unilateral chronic supportive otitis media (CSOM). Prevalence in India was found to be around 7.8% which is highest globally.

Aims and Objectives : To compare audio logical and radiological CLE findings with the mucosal and squamosal types of CSOM.

Materials and Methods: Three hundred CSOM patients were studied in the Department of Otorhinolaryngology and Head and Neck Surgery from February 2017 to August 2018. All the patients were examined with otoscope. Pure tone audiometry, X-ray mastoids lateral oblique view, tympanogram and CT scan temporal bone were performed.

Results: CSOM was more prevalent among females (54%) of young age group (41.6%). In mucosal CSOM, in diseased ear maximum patients (56.85%) had hearing loss between 25-40 dB, while in squamosal CSOM, majority patients (38.4%) had 40-55 dB hearing loss. In contralateral ear of mucosal CSOM maximum patients (85%) had 15-25 dB hearing loss, while in squamosal CSOM, 71.1% had 15-25 dB hearing loss. In mucosal CSOM, majority had type A tympanogram (79.03%) in CLE whereas in squamosal CSOM, 61.53% had type A tympanogram.

Conclusion: Incidence of abnormality in CLE was high in patients of unilateral CSOM. Both ear should be considered together as development of CSOM is a continuous process and can affect both the ears.

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1. Introduction

Chronic suppurative otitis media (CSOM) is defined as the chronic inflammation of part or whole of mucoperiosteal lining of middle ear cleft. CSOM is of two types, mucosal type (tubotympanic) and squamous type (attico-antral).¹

In unilateral CSOM patients, contralateral ear (CLEs) is usually defined as the asymptomatic ear. However, previous study also reports CSOM rarely as the isolated entity. This is because factors responsible for CSOM development in one ear can similar way affects the CLE because both the ear has the common nasopharyngeal drainage egress.²

Evidences are limited on the information in studying the pathological process of the CLEs in unilateral CSOM. Audiological and radiological study of patients with CSOM provides the evidences for the pathological process of the CLEs. Hence we can say that disease may spread from one ear to other ear. Therefore in present study we tried to compare CLE findings with the type of CSOM.

2. Materials and Methods

Present hospital based descriptive time bound study included 300 patients with unilateral CSOM in the Department of Otorhinolaryngology and Head and Neck Surgery, Gajra Raja Medical College, Gwalior (M.P.) and associated JA Group of Hospitals, Gwalior, (M.P.) from

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February 2017 to August 2018.

A detailed history along with clinical examination with otoscope was done. Pure tone audiometry was performed by a calibrated audiometer in a sound-proof room and narrow band masking was used when appropriate.

The hearing of the patient was assessed by pure tone audiogram. Hearing loss upto 15dB was considered normal, 15-25 as minimal hearing loss, 25-40 dB as mild, 40-55 dB as moderate, 55-70 dB as moderately severe, 70-90 dB as severe and above 90 as profound.

All unilateral CSOM patients coming to ENT out-patient department were included. Patients younger than age 12 were excluded to eliminate the possibility of inaccuracies of audiological testing in children. Patients older than 50 years of age were excluded because of the increased incidence of presbycusis in this age group. Patients with history of previous otologic surgery, with history of familial hearing loss, with history of prolonged exposure to noise and ototoxic drugs, head trauma and history of ear discharge in contralateral ear were excluded from the present study.

Routine blood and urine examination, pure tone audiometry, X-ray mastoids lateral oblique view (Schuller's view) – both sides, tympanogram and CT scan temporal bone was performed.

All the data analysis was performed using SPSS ver. 20 software. Frequency distribution was performed to find out the frequency of each finding. Data were expressed either as number of patients and percentage. No further statistical test were performed.

3. Results

CSOM was more prevalent in females (54%) and among the age group of 20 to 30 years (41.6%) followed by 12-20 years (27%).

Majority (82.66%) of the patients had mucosal type CSOM of which active type (69%) was more common. Squamous CSOM was reported in 17.33% patients. In mucosal CSOM, 67.74% were having CHL, 31.85% were having SNHL hearing loss and 0.4% having mixed hearing loss. In squamous CSOM, 63.46% having CHL, 34.61% was having SNHL and 1.9% was having mixed hearing loss.

In disease ear 240 (80%) were having sclerosed mastoid and 60(20%) were having diploic mastoid pneumatisation. In contralateral ear out of 300, 200(66.6%) were having normal pneumatisation, 45(15%) were having sclerosed and 55(18.33%) were having diploic mastoid pneumatisation.

4. Discussion

CSOM is divided into mucosal type and squamous type of chronic otitis media. There are various theories on pathogenesis of CSOM. In our study mucosal CSOM was seen in 82.66% and squamous COM in 17.33%. It can be explained because of low incidence of squamous

CSOM and patients with squamous CSOM seek medical advice only when they get significant hearing problem or complications of CSOM. Study done by Abushahma et al reported similar findings.³ Abushahma et al³ found that mucosal CSOM was most common affecting 76% of the patients as compared to squamous CSOM (34%). Shireen et al findings were also in line with the findings of present study where majority had mucosal CSOM (73.75%) as compared to squamous CSOM (26.25%).⁴

In diseased ear, on examination of affected ear tympanic membrane perforation was seen in pars tensa and pars flaccida. In pars tensa 13.33% were small CP, 39.66% medium CP, 20% were large CP and 9.6% were subtotal, marginal perforation in 4.3% and attic perforation in 2%. Granulations tissue were seen in 4%, polyp in 1.66% and cholesteatoma was seen in 5.3%. These findings are in accordance with previous studies done by Nagle et al⁵ in which most common finding was medium CP and with Kumara et al⁶ where medium CP was most common (40.7%) followed by large CP (15.4%), granulation tissue (9.8%) and polyp (6.5%).

In contralateral ear, in our study, in mucosal type of COM, 59.67% CLE were abnormal. Most common finding was retraction of tympanic membrane, pars tensa retraction seen in 26.20%, among which grade 1 retraction was most common. Pars flaccida retraction was seen in 4.4% cases. Tympanosclerosis was seen in 12.09%, thinning of TM in 17.33%, and effusion in 6% patients.

In squamous type of COM, 75% of CLE were abnormal. Most common finding was retraction of tympanic membrane, pars tensa retraction seen in 34.61% , pars flaccida retraction seen in 17.3%, tympanosclerosis seen in 23%, thinning of TM in 26.9% and effusion seen in 13.46%. It correlates with the study done by Shireen et al.³ In their study, in squamous disease, 76.2% had abnormalities, the most common being pars tensa retraction (52.3%) followed by thinning of TM (38.1%), tympanosclerosis (19%) and pars flaccida retraction (14.2%). In mucosal disease, 66.1% had abnormal TM, most common being thinning of TM (40.7%), followed by pars tensa retraction (33.9%), tympanosclerosis (18.6%) and pars flaccida retraction (3.3%).⁴ Similar results were revealed in the study done by Abushahma et al,³ in their study, in mucosal type, 76.3% patients had abnormal finding in CLE, most common being retracted TM 32.9%, tympanosclerotic patches 27.6% and effusion 15.8%. In squamous type 88.2% patients had abnormal finding in CLE, most common being retracted TM 38.2%, tympanosclerotic patches 32.7% and effusion 16.4%.³ Adhikari et al performed a similar study on CSOM patients and reported that in mucosal type, 62.9% patients had abnormal CLE, 29.3% being retraction of TM, 8.9% was tympanosclerosis patches. In squamous type, 71.4% patients had abnormal CLE, 33.8% being retraction of TM, 10.1% was tympanosclerosis patches, which is in line with

Table 1: Comparing Degree of hearing loss with types of CSOM

Hearing Loss in Decibel	CSOM			
	Mucosal		Squamosal	
	DE	CLE	DE	CLE
0 to 15(Normal)	0(0)	0(0)	0(0)	0(0)
15-25 (Minimal)	0(0)	211(85)	0(0)	37(71.1)
25 – 40 (Mild)	141(56.85)	35(14.11)	15(28.8)	14(26.92)
40 – 55 (Moderate)	83(33.46)	2(0.8)	20(38.4)	1(1.92)
55 – 70 (Moderately severe)	20(8)	0(0)	16(30.7)	0(0)
70 – 90 (Severe)	2(0.8)	0(0)	1(1.9)	0(0)
> 90 (Profound)	2(0.8)	0(0)	0(0)	0(0)
Total	148	248	52	52

Data is expressed as no of patients (percentage), CSOM; chronic suppurative otitis media, DE; diseased ear, CLE; contralateral ear.

Table 2: Impedance Audiometry of CLE

Type of CSOM	Type of Tympanogram	No. of Cases	Percentage
Mucosal [248 (82.66%)]	Type A	196	79.03
	Type B	30	12.09
	Type C	22	8.8
Squamosal [52 (17.33%)]	Type A	32	61.53
	Type B	10	19.23
	Type C	10	19.23

Data is expressed as no of patients (percentage), CSOM; chronic suppurative otitis media, CLE; contralateral ear

the present study findings.²

In our study, in mucosal type, 85% were having minimal hearing loss, 14.11% mild hearing loss and 0.8% moderate hearing loss. In squamosal type, 71.1% were having minimal hearing loss, 26.92% mild hearing loss and 1.92% moderate hearing loss. In our study 85% patients were having minimal hearing loss; they were diagnosed because they underwent PTA. If we consider WHO classification they will come under normal hearing, as in WHO classification upto 25dB hearing loss is considered normal.

We also found that in CLE, 66% were having normal pneumatization, 18.33% were having diploic, and 15% sclerosed. Present study findings are in line with the Munish et al where they found that 78.5% showed normal pneumatisation and 21% showed sclerosis in CLE.⁷ Another study done by Roy et al reported that pneumatisation was seen in 42.6%, diploic in 31.43% and sclerosis in 25.71% patients.⁸

In mucosal CSOM, 79% had type A tympanogram, 12% had type B and 8.8% had type C whereas in squamosal CSOM 61.53% had type A, 19.23% had type B and 19.23% had type C in CLE. It was in accordance with Jadia et al where they reported Type A in 71% and Type B in 29% patients.⁹

Present study has few limitations, being cross sectional nature of the study, present study findings cannot be applied to larger population, a large randomized clinical trial is need to provide strength to present study findings.

5. Conclusion

We found that incidence of abnormality in CLE is high. It highlights the importance of considering both the ear as a pair. Disease in one ear mainly, in mucosal type needs a close follow up of other ear. Unilateral CSOM should not be considered as a static phenomenon but as a continuous process in other ear too. Significant improvement can be seen in CLE after intervention. However, we have not presented any data on the treatment outcome in CLE. However, present study findings can be used in therapeutic planning of diseased ear, counseling of patient regarding other ear and if necessary providing therapeutic intervention in the other ear at the earliest.

6. Source of Funding

None.

7. Conflict of Interest

None.

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