

A Hospital Based Prospective Study to Assess the Status of Contralateral Ear in Unilateral Chronic Otitis Media (COM)

Hari Singh Khedar^{1*}, Punit Kumar Lamoria², Anand³

¹Associate Professor, Department of Otorhinolaryngology, Government S. K. Medical College, Sikar, Rajasthan, India

²Senior Demonstrator, Department of Preventive & Social Medicine, Government S. K. Medical College, Sikar, Rajasthan, India

³Junior Resident, Department of Otorhinolaryngology, NIMS Medical College, Jaipur, Rajasthan, India

Received: 24-05-2021 / Revised: 10-06-2021 / Accepted: 30-07-2021

Abstract

Background: COM is characterized as an inflammatory condition associated with a persisting perforation of the Tympanic membrane (TM) and chronic otorrhoea for more than 3 months. The main purpose of this study was derived from the fact that nasopharynx act as a common portal for drainage for both ears through left and right Eustachian tube, and hence factors responsible for COM on one ear may also affect the other ear. **Materials & Methods:** This is a prospective study done on 100 patients attending with unilateral COM without perforation or history of ear discharge in the contralateral ear in department of ENT at government medical college, Sikar, Rajasthan during one year period. All age groups were included. Contralateral ear is defined as the asymptomatic ear or the ear with no history of ear discharge or hearing impairment. All the patients were evaluated for the presence of changes in the contralateral ear according to complete history and clinical examination, otoscopic findings, pure tone audiometry, X-ray mastoid (lateral oblique view) and/or high-resolution computed tomography (HRCT) temporal bone wherever indicated. **Results:** The mean age of patients was 28.7 yrs, male to female ratio was 1.5:1. The incidence of mucosal type of COM was 88% (88 patients) which was more than squamosal type of COM 12% (12 patients). Hearing status in the contralateral ear was analysed and it was found that normal hearing was present among 43 patients of mucosal type of COM and 2 patients of squamosal type of COM. 49 (49%) patients had conductive hearing loss in contralateral ear among which 40 patients had mucosal type of COM and 9 patients had squamosal type of COM in the affected ear. **Conclusion:** We can conclude that according to our study, those who had squamosal type COM had more abnormal contralateral ears than those who had mucosal type COM.

Keywords: Hearing Loss, Contralateral Ear, COM, Mucosal, Squamous.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Chronic otitis media (COM) implies a permanent abnormality of the pars tensa or flaccida, most likely a result of earlier acute otitis media, negative middle ear pressure or otitis media with effusion. COM is characterized as an inflammatory condition associated with a persisting perforation of the Tympanic membrane (TM) and chronic otorrhoea for more than 3 months.

COM can be classified into active mucosal type, inactive mucosal type, active squamosal type, inactive squamosal type and healed otitis media. COM can be characterized histopathologically by middle ear pathology such as granulation tissue, cholesterol granulomas or cholesteatoma formation[1]. The incidence of COM in India was found to be 7.8%[2].

One of the theories for its pathogenesis is the 'Continuum theory' as proposed by Paparella in which Otitis Media is described as a sequence of events, initiated by an insult that would lead to a cascade of events.

It begins with OME, progresses through AOM and leads to COM and/or its complications/sequelae. Patients with COM in one ear have a high chance of presenting with some degree of disease in the contralateral ear. The contralateral ear is the ear which is asymptomatic or the ear which has clearly less symptoms in the presence of an intact TM[3].

Otitis media seems to exist through a continuous series of epithelial and subepithelial events, and, after the initial triggering episode, a serous or purulent otitis media becomes serous-mucoid, then mucoid, and, in the absence of therapeutic resolution, chronicity may ensue. The main purpose of this study was derived from the fact that nasopharynx act as a common portal for drainage for both ears through left and right Eustachian tube, and hence factors responsible for COM on one ear may also affect the other ear[4,5]. The aim of the study was to establish that patients with symptomatic unilateral COM can have subclinical/ asymptomatic otological findings suggestive of COM in the contralateral ear.

Materials & methods

This is a prospective study done on 100 patients attending with unilateral COM without perforation or history of ear discharge in the contralateral ear in department of ENT at government medical college, Sikar, Rajasthan during one year period. All age groups were included.

Contralateral ear is defined as the asymptomatic ear or the ear with no history of ear discharge or hearing impairment. All the patients were evaluated for the presence of changes in the contralateral ear

*Correspondence

Dr. Hari Singh Khedar

Associate Professor, Department of Otorhinolaryngology, Government S. K. Medical College, Sikar, Rajasthan, India

E-mail: drharisinghkhedar@gmail.com

according to complete history and clinical examination, otoscopic findings, pure tone audiometry, X-ray mastoid (lateral oblique view) and/or high-resolution computed tomography (HRCT) temporal bone wherever indicated. Contralateral ear was evaluated as normal or abnormal. The contralateral ear was labelled abnormal if any pathological findings were detected as follows:

1. In otoscopy abnormal findings include retraction, tympanosclerosis, atrophy of the tympanic membrane.
2. In pure tone audiometry, type and degree of hearing loss (according to WHO classification) was assessed.
3. In X-ray mastoid, HRCT temporal bone the degree of sclerosis of mastoid, status of ossicles, middle ear, dural plate, sinus plate were noted.

Statistical Analysis

Data has been summarized as mean and standard deviation for numerical variables and count and percentages for categorical variables and analyzed using SPSS software version 24 and descriptive analysis done.

Results

In our study majority of patients having COM in the affected ear (45%) was in the age group of 21 to 30 years. Least number of

patients were in the age group of >50 years. The number of male patients was 60 (60%) and female patients were 40 (40%). Out of total 100 patients 52 (52%) patients were from rural and 48 (48%) were from urban background which showed that incidence of COM was slightly more in rural population (table 1).

The incidence of mucosal type of COM was 88% (88 patients) which was more than squamosal type of COM 12% (12 patients). In our study of 100 patients of unilateral COM, total 20 (20%) patients were found to have normal contralateral ears out of which 18 patients had mucosal type of COM and 2 patients had squamosal type of COM in the diseased ear. A total of 80 (80%) patients were found to have some abnormalities in the contralateral ear among this 80 patients, 70 contralateral ears had mucosal type COM and 10 contralateral ears had squamosal type COM in the diseased ear (table 2).

Otosopic findings in the contralateral ears were assessed in table no. 3.

Hearing status in the contralateral ear was analysed and it was found that normal hearing was present among 43 patients of mucosal type of COM and 2 patients of squamosal type of COM. 49 (49%) patients had conductive hearing loss in contralateral ear among which 40 patients had mucosal type of COM and 9 patients had squamosal type of COM in the affected ear (table 4).

Table 1: Demographic profile of patients

Demographic profile	No. of patients (N=100)	Percentage
Age group (yrs)		
1-10 yrs	7	7%
11-20 yrs	20	20%
21-30 yrs	45	45%
31-40 yrs	12	12%
41-50 yrs	10	10%
>50 yrs	6	6%
Mean±SD	28.7±5.34	
Gender		
Male	60	60%
Female	40	40%
Residence		
Rural	52	52%
Urban	48	48%

Table 2: Incidence of type of COM and status of contralateral ear

Contralateral ear	Unilateral COM	
	Mucosal type (N=88)	Squamosal type (N=12)
Normal (N=20)	18	2
Abnormal (N=80)	70	10

Table 3: Otoscopic findings in contralateral ear

Contralateral ear	Type of disease in affected ear		Total (%)
	Mucosal type	Squamosal type	
Normal	15 (17.04%)	1 (8.33%)	16 (16%)
G1R	8 (9.09%)	1 (8.33%)	9 (9%)
G2R	37 (42.04%)	6 (50%)	43 (43%)
G3R	13 (14.77%)	1 (8.33%)	14 (14%)
G4R	0 (0%)	1 (8.33%)	1 (1%)
Thinned tympanic membrane	7 (7.95%)	1 (8.33%)	8 (8%)
Tympanosclerotic patch	8 (9.09%)	1 (8.33%)	9 (9%)
Total	88 (88%)	12 (12%)	100 (100%)

Table 4: Hearing status assessment in contralateral ear

Hearing status in contralateral ear	Type of disease in affected ear		Total (%)
	Mucosal type	Squamosal type	
Normal	43 (48.86%)	2 (16.66%)	45 (45%)
Conductive hearing loss	40 (45.45%)	9 (75%)	49 (49%)
Mixed hearing loss (mixed)	5 (5.68%)	1 (8.33%)	6 (6%)
Sensorineural hearing loss	0 (0%)	0 (0%)	0 (0%)
Total	88 (88%)	12 (12%)	100 (100%)

Discussion

The main reason of COM is malfunction of Eustachian tube, it is probable that a patient with COM will have a disorder in the

contralateral ear (CLE)[6]. Majority of patients of COM in our study belong to 3rd decade which is in accordance with a study by Chandrashekharayya et al[7] in which maximum number of patients

were from 3rd and 4th decade[6]. Slight male predominance (60%) was noted as was in a study by Chavan et al[8] which also showed slight male dominance (1.1:1). Incidence of COM was slightly more in rural population (52%) as compared to Urban population (48%). Similar results found by Chandrashekarayya et al[6].

Paparella et al[3] revealed that the disease in one ear is linked to subclinical disease in the contralateral ear. He validated the Continuum theory and described Silent COM. He studied microscopic changes in the temporal bones of contralateral ears. He professed that COM in one ear slowly affects the other ear too.

The incidence of mucosal type of COM was 88% which was more than squamous type of COM 12%, similar to a study by Kutty et al[9] in which 73.75% had mucosal and 26.25% had squamous disease. Adhikari et al[10] found that 64% patients had mucosal type of COM and 36% had squamous type of COM in the diseased ear.

Otosopic findings in the contralateral ears were assessed with respect to type of disease in affected ear and it was found that 15 patients (17.04%) of mucosal type of COM and 1 patient (8.33%) of squamous type of COM in the affected ear had normal contralateral ears. In total 16 patients (16%) had normal contralateral ears. According to a study by Adhikari et al[10] the most common findings in contralateral ear in both mucosal and squamous type of COM patients was retraction of the tympanic membrane.

Hearing status in the contralateral ear was analyzed and it was found that normal hearing was present among 43 patients of mucosal type of COM and 2 patients of squamous type of COM. 49 (49%) patients had conductive hearing loss in contralateral ear among which 40 patients had mucosal type of COM and 9 patients had squamous type of COM in the affected ear. According to a study conducted by Damghan et al[11] entitled alterations in the contralateral ear in COM, PTA showed a 48% incidence of contralateral ear problems (85% conductive hearing impairment; 12.5% sensorineural hearing impairment; 1.2% mixed hearing impairment). No patient had profound hearing loss in our study, which was similar findings with Kutty et al[9].

Conclusion

We can conclude that according to our study, those who had squamous type COM had more abnormal contralateral ears than those who had mucosal type COM.

References

1. Browning GG, Weir J, Kelly G, Swan IRC. Chronic Otitis Media. In: Watkinson JC, Clarke RW. Scott Brown's Otorhinolaryngology Head and Neck Surgery. 8 th ed. CRC Press; 2018;2:977-1019.
2. Kumari MS, Madhavi J, Krishna NB, Meghanadh KR, Jyothy A. Prevalence and associated risk factors of otitis media and its subtypes in South Indian population. Egyptian J Ear Nose Throat Allied Sci. 2016;17(2):57-62.
3. Paparella M. Silent otitis media. Laryngoscope 1980; 90(7 Pt. 1): 1089-98.
4. da Costa SS, Rosito LP, Dornelles C, Sperling N. The contralateral ear in chronic otitis media: a series of 500 patients. Arch Otolaryngol-Head Neck Surg. 2008;134(3):290-3.
5. da Costa SS, de Souza LC, de Toledo Piza MR. The flexible endauraltympanoplasty: pathology-guided, pathogenesis-oriented surgery for the middle ear. Otolaryngologic Clin N Am. 1999;32(3):413-41.
6. Damghani MA, Barazin A. Alterations in the Contra lateral Ear in Chronic Otitis Media. Iranian J Otorhinolaryngol. 2012;25(71):99-102.
7. Chandrashekarayya SH, Kavitha MM, Prakash Handi PK, SS D. To Study the Level of Awareness About Complications of Chronic Suppurative Otitis Media (CSOM) in CSOM Patients. J Clin Diagnos Res. 2014;8(2):59.
8. Chavan SS, Jain PV, Vedi JN, Rai DK, Kadri H. Ossiculoplasty: a prospective study of 80 cases. Iran J Otorhinolaryngol. 2014;26(76):143-50.

9. Azizkuty S, Mohammed NA. Status of contralateral ear in unilateral chronic otitis media. Int J Otorhinolaryngol Head Neck Surg. 2016;3(1):135-9.
10. Adhikari P, Khanal S. Status of contralateral ear in patients with chronic otitis media. Int J Health. 2009;20(2):72-9.
11. Damghani MA, Barazin A. Alterations in the Contra lateral Ear in Chronic Otitis Media. Iranian J Otorhinolaryngol. 2012;25(71):99-102.

Conflict of Interest: Nil Source of support: Nil