International Journal of Otorhinolaryngology and Head and Neck Surgery
Pardhi KA et al. Int J Otorhinolaryngol Head Neck Surg. 2019 Nov;5(6):1641-1645
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937

Original Research Article

DOI: http://dx.doi.org/10.18203/issn.2454-5929.ijohns20194941

Evaluation of the contralateral ear in patients with unilateral chronic otitis media

Krupal A. Pardhi*, Netra A. Pathak, Kiran J. Shinde

Department of Otorhinolaryngology, Head and Neck Surgery, Smt. Kashibai Navale Medical College and General Hospital, Pune, Maharashtra, India

Received: 31 July 2019
Revised: 02 October 2019
Accepted: 03 October 2019

***Correspondence:**
Dr. Krupal A. Pardhi,
E-mail: krupalpardhi@gmail.com

ABSTRACT

Background: Unilateral chronic otitis media (COM) is a condition likely to affect the other side also caused by various etiological factors. If diagnosed and intervened in time, the progression of the disease can be prevented and ear can be protected from various sequelae. Hence, it is important to assess and evaluate the contralateral ear (CLE) completely.
Methods: A prospective study of 12 months was conducted in the Otorhinolaryngology department, enrolling 80 patients with unilateral chronic otitis media. The CLE defined as the asymptomatic ear without ear discharge or any other complaints. Otoscopy, pure tone audiometry, tympanometry and X-ray mastoid done on patients. The results were recorded and analysed.
Results: On otoscopic findings 76.36% patients in mucosal and 88% patients in squamosal showed abnormalities in CLE. Pure tone audiometry (PTA) showed 75% patients had hearing loss in CLE 46.25% conductive hearing loss (HL), 11.25% sensorineural HL and 17.5% mixed HL in CLE. In squamosal type of COM 76% patients had hearing impairment as compared to mucosal type 74.54%. In tympanometry findings 58.75% patients had type B curve in CLE. Radiographic finding of CLE showed sclerotic mastoid air cells 32% in squamosal and 9.09% in mucosal type.
Conclusions: Approximately 80% patients with unilateral COM have abnormal ear findings in CLE. Squamosal type of unilateral COM had more chances of abnormalities in CLE. In this study results showed that the CLE can also be affected in unilateral COM.

Keywords: Chronic otitis media, Contralateral ear, Squamosal, Mucosal, Tympanic membrane

INTRODUCTION

Chronic otitis media is defined as a chronic inflammation of middle ear cleft. Chronic otitis media is divided into mucosal and squamosal. When the inflammation is associated with a discharge through a tympanic membrane perforation, it is known as chronic otitis media. It may be acute when less than 6 weeks or chronic when discharge occurs more than 6 weeks.[1] Prevalence in India was found to be around 7.8% which is highest internationally.[2] COM is an inflammatory process may be present even without TM perforation and otorrhoea-called as silent chronic otitis media (SCOM) by Paparella et al.[3] 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 and lead to a cascade of events. It begins with otitis media effusion, progresses through acute otitis media and leads to COM and/or its sequelae. Patients with COM in one ear have a high chance of presenting with some abnormalities in the contralateral ear. CLEs is defined as asymptomatic ear in cases of unilateral COM, as along with other studies reports, a COM is rarely an isolated entity, because the responsible factors for its development in one ear were in similar way will impact the CLEs, since both ears had a common

"nasopharyngeal" drainage ; hence, the assessment of the CLEs would tell about the etiology and the evolution of the disease pathological process, as these changes which had been detected in the affected ear might represent the terminus of the pathological process what found in the CLEs.[4] Not many studies have evaluated this concept of silent COM. The aim of the study was to find out the status of contralateral ear in unilateral middle ear disease in patients who attended ENT OPD between June 2018 to June 2019.

METHODS

Study type

An observational prospective type.

Study place

The study was conducted at ENT OPD, at Smt. Kashibai Navale medical college and general hospital, Pune.

Study period

The study was conducted from June 2018 to June 2019.

Selection criteria of patients

Eighty patients were enrolled in this study. Patients presenting with unilateral ear complaints diagnosed with COM were enrolled.

Inclusion criteria

Patients aged more than 10 years with chronic otitis media and conductive deafness in diseased ear were included.

Exclusion criteria

Patients with revision surgery, sensorineural hearing loss in diseased ear and systemic diseases like diabetes mellitus will be excluded from this study.

Procedure

For the purpose of study analysis, the ears with COM were categorized into two groups; those without cholesteatoma (mucosal type group) and with cholesteatoma (squamosal type group).

The history and clinical findings were recorded. Otoscopy, pure tone audiometry (PTA), tympanometry and X-ray bilateral mastoid were done. The CLE was defined as the ear with no perforation of tympanic membrane (TM). The pars tensa retraction was classified according to Sade' and pars flaccida retractions according to Tos.[5,6] The TM was also examined for evidence of tympanosclerosis and thinning. X-ray mastoid was done to find presence of mastoid bone sclerosis, PTA was done and degree of hearing loss was graded as mild, moderate and severe. Presence of sensorineural and mixed hearing loss was also accounted.

Ethical considerations

Ethical clearance was obtained for conducting the study from institutional ethics committee of Smt. Kashibai Navale Medical College and General Hospital, Pune.

Statistical analysis

The data was collected, compiled and analyzed using EPI info (version 7.2). The qualitative variables were expressed in terms of percentages. The quantitative variables were both categorized and expressed in terms of percentages or in terms of mean and standard deviations. Difference between two proportions was analyzed using Chi-square or Fisher exact test. All analysis was 2 tailed and the significance level was set at 0.05.

RESULTS

There were 51 (62.96%) females and 29 (36.25%) males in this study. Of the 80 cases, 16 (20%) and 64 (80%) had normal and abnormal findings of tympanic membrane in contralateral ear respectively (Table 1).

Out of the 80 cases, 55 (68.75%) and 25 (31.25%) had a feature, otoscopic. Examination and investigation finding confirm the diagnosis mucosal and squamosal type of COM respectively as presented in Figure 1. The incidence of abnormal TM of CLEs was 76.36% mucosal type and 88% in squamosal type, where TM retraction 35% was the most common structural abnormality overall (Table 2). On otoscopic examination findings of mucosal type of COM were retracted tympanic membrane in 32.72% cases, tympanosclerotic patches in 27.27% cases and effusion in 16.36% cases while in squamosal type retracted tympanic membrane 40%, tympanosclerotic patches 32% and effusion 16% cases showed abnormalities in their contralateral ear (Table 3).

Table 1: Condition of tympanic membrane in contralateral ear.

Condition of tympanic membrane in contra lateral ear	Male	Female	Total patients	P value
	N (%)	N (%)	N (%)	
Normal	10 (62.5)	6 (37.5)	16 (20)	0.0141
Abnormal	19 (65.51)	45 (88.23)	64 (80)	
Total	29 (36.25)	51 (62.96)	80 (100)	

In mucosal type, out of 55 cases 41 (74.54%) had hearing loss and 25.45% had normal hearing sensitivity in their contralateral ear while in squamosal type out of 25 cases 19 (76%) had hearing loss and 24% had normal hearing sensitivity in their contralateral ear (Table 4). In mucosal type, 45.45% cases had mild hearing loss and 3.63% had moderate hearing loss in their contralateral ear while in squamosal type 32% cases had mild hearing loss and 8% had moderate hearing loss in their contralateral ear (Table 5).

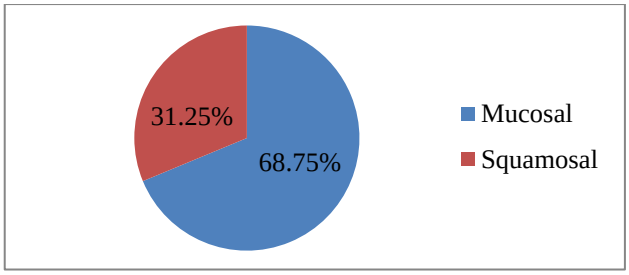

Figure 1: Types of COM in diseased ear.

Table 2: Abnormalities in contralateral ear in all patients in unilateral COM.

Types of COM	Normal	Abnormal	Total	P value
	N (%)	N (%)	N (%)	
Mucosal	13 (23.63)	42 (76.36)	55 (68.75)	0.2278
Squamosal	3 (12)	22 (88)	25 (31.25)	

Table 3: Otoscopic findings of contralateral ear.

Types of COM	Retraction of tympanic membrane	Tympanosclerotic patches	Effusion	P value
	N (%)	N (%)	N (%)	
Mucosal	18 (32.72)	15 (27.27)	9 (16.36)	0.0988
Squamosal	10 (40)	8 (32)	4 (16)	
Total	28 (35)	23 (28.75)	13 (16.25)	

Table 4: Types of hearing loss in contralateral ear.

Types of COM	Conductive hearing loss	Sensorineural hearing loss	Mixed hearing loss	Total number of hearing loss patient	P value
	N (%)	N (%)	N (%)	N (%)	
Mucosal	27 (49.09)	4 (7.27)	10 (18.18)	41 (74.54)	0.2462
Squamosal	10 (40)	5 (20)	4 (16)	19 (76)	
Total hearing loss	37 (46.25)	9 (11.25)	14 (17.5)	60 (75)	

Table 5: Pure tone audiometry findings.

Pure tone audiometry (in dB)	Mucosal type diseased ear	Mucosal type contra lateral ear	Squamosal type diseased ear	Squamosal type contra lateral ear
	N (%)	N (%)	N (%)	N (%)
<25	-	14 (25.45)	-	7 (28)
26-40	26 (47.27)	25 (45.45)	7 (28)	10 (40)
41-55	18 (32.72)	2 (3.63)	12 (48)	2 (8)
56-70	11 (20)	-	6 (24)	-
Total no. of patients	55 (68.75)	41 (74.54)	25 (31.25)	19 (76)

Table 6: Tympanometry findings in contralateral ear.

Types of COM	Type A	Type B	Type C	P value
	N (%)	N (%)	N (%)	
Mucosal	14 (25.45)	32 (58.18)	9 (16.36)	0.9873
Squamosal	6 (24)	15 (60)	4 (16)	
Total	20 (25)	47 (58.75)	13 916.25)	

Tympanometry findings in contralateral ear showed type B curve in (58.75%) cases of which 32 and 15 patients were of mucosal and squamosal type COM respectively (Table 6). Radiographic findings of contralateral ear, in mucosal COM showed sclerotic mastoid air cells in 5 (9.09%) cases while in squamosal COM 8 (32%) cases

having Chi-square=5.052 with 1 degree of freedom p=0.025 (statistically significant).

DISCUSSION

Chronic otitis media occurs due to inflammation in middle ear cleft and is persistent and long standing, with varying prevalence around the world. It is a major health problem in developing countries. Over populated families, poverty, personal sanitation and poor environment and living in slums are factors of some of the leading causes of the condition. Malfunction of eustachian tube plays an important role in development of disease. According to continuum theory, in the absence of arresting mechanism, the pathology may progress bilaterally in a considerable proportion of cases, although with differing degree of severity. Although clinical studies published by Seibel et al have demonstrated a high prevalence of alteration in contralateral ears.[7] Otitis media with effusion is recognized as an initial condition which, when unresolved, may progress to chronic transformation. Although only a small percentage of cases of otitis media with effusion will progress to chronic otitis media, considering that the presence of bilateral effusion is reported to high, it might be expected that the prevalence of bilateral chronic otitis media would be similarly prevalent.[8] Limited study data are available in the literature relating to the contralateral ear in patients with COM. Chilton et al assessed the contralateral ear in 73 patients and found abnormalities in (53.4%) of them.[9] Virtanen et al described a series of 493 contralateral ears in patients undergoing for surgery of chronic otitis media. They found 63% of the contralateral ear having some degree of abnormalities.[10] Adhikari et al evaluated the status of contralateral ear in 750 patients and found abnormalities (62.8%) in mucosal type and (71.4%) in squamosal type of CSOM.[11] Ali et al assessed the contralateral ear in 100 patients and found abnormalities in more than (54%) patients.[12] Patients with unilateral COM are very likely to present with associated disease in opposite contralateral ear. The importance of contralateral ear is for the better understanding of the pathogenesis of chronic otitis media and treatment and counseling of such patients. Patients with chronic otitis media diagnosed in one ear are very likely to present with associated disease in the contralateral ear. The cholesteatoma chronic otitis media group had a greater prevalence of contralateral ear alterations than those in the noncholesteatoma chronic otitis media group. Our study revealed that (88%) squamosal type of unilateral COM had a more chances of contralateral ear involvement than (76.36%) mucosal type. The precise and critical evaluation of both ears plays a fundamental role in the prognostic evaluation of the patient because the ear with established chronic otitis media can serve as a guide for the probable evolution in the contralateral ear. Our findings clearly suggest that the tendency of chronic otitis media to present itself as a bilateral disease.

CONCLUSION

Patients with chronic otitis media in one ear are more likely to develop some degree of disease in the contralateral ear. Approximately (80%) patients with unilateral COM have abnormal ear findings in contralateral ear. Squamosal type of unilateral COM had more chances of abnormalities in contralateral ear. In this study the results showed that disease of unilateral ear can also affects the contralateral ear.

ACKNOWLEDGEMENTS

We are deeply indebted to our teachers for their constant encouragement and support.

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

REFERENCES

1. Browning GG. Aetiopathology of inflammatory condition of the external and middle ear. In: Kerr AG, ed. Scott Brown's Otolaryngology. 6th ed. London: Arnold; 1997.
2. Acuin J. Chronic suppurative otitis media: burden of illness and management options. Geneve: World Health Organization; 2004: 83.
3. Paparella M. Silent otitis media. Laryngoscope. 1980;90:1089-98.
4. Shireen AK, Mubeena, Mohammed NA. Status of contralateral ear in unilateral chronic otitis media. Int J Otorhinolaryngol Head Neck Surg. 2017;3:135-9.
5. Sade J, Berco E. Atelectasis and secretory otitis media. Ann Otol Rhinol Laryngol. 1976;85(25):66.
6. Tos M, Poulsen G. Attic retractions following secretory otitis. Acta Otolaryngol. 1980;89(5-6):479-86.
7. Scheibe B, Smith M, Schimdt LP, Schimdt VB, Dornelles C, Carvalhal LHSK, et al. Contralateral ear in chronic otitis media: Efeito Orloff. Rev Bras Otorhinolaryngol. 2002;68:245-59.
8. Casselbrant ML, Brostoff LM, Cantekin EL, Flaherty MR, Blueston CD, Fria TJ, et al. Otitis media with effusion in preschool children. Laryngoscope. 1985; 95(4):428-36.
9. Charlton RA, Stearns M. The incidence of bilateral chronic otitis media. J Laryngol Otol. 1984;98(4):337-9.
10. Vartiainen E, Kansanen M, Vartiainen J. The contralateral ear in patients with chronic otitis media. Am J Otol. 1996;17(2):190-2.
11. Adhikari P, Khanal S, Bhatta R, Sigdel S, Baral D. Status of contralateral ear in patients with chronic otitis media. Internet J Health. 2009;10(2):1-4.

12. Damghani MA, Barazin A. Alteration in the contralateral ear in chronic otitis media. Iran J Otorhinolaryngol. 2013;25(2):71.

Cite this article as: Pardhi KA, Pathak NA, Shinde KJ. Evaluation of the contralateral ear in patients with unilateral chronic otitis media. Int J Otorhinolaryngol Head Neck Surg 2019;5:1641-5.