

## Original Research Article

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# Assess the hearing of contralateral ear in patients with unilateral chronic squamosal otitis media

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## ABSTRACT

**Background:** Chronic squamosal otitis media can occur due to many conditions affecting the middle ear. Most common sign of developing a chronic squamosal otitis media is formation of a retraction pocket in the tympanic membrane leading to further development of a cholesteatoma and if not treated properly, may lead to development of dangerous complication in the affected ear. These etiological factors may also affect the other ear. It is therefore very necessary to assess and diagnose the contralateral ear, so that the disease can be intervened and treated at the right time, to prevent any deterioration in hearing of the contralateral ear.

**Methods:** The prospective study was done in 100 patients with unilateral chronic squamosal otitis media, where the contra lateral ear was examined and assessed for any hearing loss.

**Results:** We found hearing loss in the contra lateral ear ranging from mild conductive hearing loss to sensorineural hearing loss with the maximum patients with mild conductive hearing loss (42%) and lowest in sensorineural hearing loss (1%).

**Conclusions:** In our study, 76 patients were seen with conductive hearing loss. Out of that, 42% patients were seen with mild conductive hearing loss, 30% with moderate conductive hearing loss and 4% with severe conductive hearing loss. 20% patients were seen with normal hearing. 3% patients were seen with mixed hearing loss and only 1% patient was seen with sensorineural hearing loss in contralateral ear.

**Keywords:** Squamosal COM, Contralateral ear, Hearing loss, Conductive hearing loss

## INTRODUCTION

Chronic squamosal otitis media is a condition in which due to repeated negative middle ear pressure, retraction of the tympanic membrane develops. This retraction then leads to development of a retraction pocket and may further leads to development of cholesteatoma formation.

The global burden of illness from CSOM involves 65-330 million individuals with draining ears.<sup>1</sup> Prevalence in India was found to be around 7.8% which is the highest globally.<sup>2</sup>

Chronic squamosal otitis media is further divided into an active and inactive squamosal otitis media. A “retraction pocket” of the tympanic membrane is when it invaginates into the middle ear space, which may be fixed when it adherent to the structures of the middle ear or may be free when it can move laterally or medially.<sup>3</sup> Inactive squamosal otitis media is characterized by formation of retraction pocket, atelectasis and epidermization.

Active squamosal otitis media is characterized by formation of a cholesteatoma which occurs due to retention of the keratin debris from the ear in the retraction pocket. This retention may be associated with

active bacterial infection leading to profuse otorrhea. Formation of cholesteatoma is dangerous because of their potential to incite resorption of bone leading to intratemporal and intracranial complications.<sup>4</sup>

Contralateral ear is defined as the asymptomatic ear in unilateral chronic otitis media. Chronic otitis media is usually not an isolated disease and it affects the other ear due to the same etiological factors affecting the diseased ear. It is very important to assess the other asymptomatic ear so that if there is any disease process, it can be evaluated and treated early.

The purpose of this study is to assess the hearing of the contralateral ear in patients with unilateral chronic squamous otitis media.

## METHODS

This was a prospective study. It was done in Dr DY Patil medical college and hospital, DPU, Pune from September 2016 to 2017. All patients suffering with unilateral Squamous chronic otitis media above the age of 6 years were included.

The exclusion criteria were traumatic perforation, bilateral chronic otitis media, and previous history of ear discharge in contralateral ear.

Cases selected for the study were subjected to a detailed history taking and clinical examination of ear, nose and throat with special reference to the ear.

The method of study was carried out under the following heading: history taking, clinical examination, the ears were examined by otoscopy initially and subsequently by a microscope to establish the diagnosis. Investigations like pure tone audiometry, impedance audiometry was done in all the patients, and high-resolution computed tomography scan was done in patients as per requirement.

Quantity of data was summarized using mean and standard deviation. Quality of data was summarized using percentage such as paired 't' test was used

### Ethics approval

The necessary permission and approval from ethics committee and authority, prior to starting the study was taken. Informed written consents were obtained from the patients

## RESULTS

In our study, 68 (68%) patients were in the adult age group (between 12-60 years of age). 32 patients were in the pediatric age group (between the age group of 6-12 years (32%)). Out of the adult age group, 30 (44%) were male patients and 38 (66%) were female patients. Out of

the pediatric age group, 15 (47%) were male patients and 17 (53%) were female patients.

**Table 1: Adult and pediatric age group.**

Gender	Adult (12-60 years)	Paediatric (6-12 years)	Total
Male	30	15	45
Female	38	17	55
Total	68	32	100

**Table 2: Degree of hearing loss.**

S. no	Hearing loss	No. of ears
1.	Normal hearing	20
2.	Conductive hearing loss	Mild 42
		Moderate 30
		Severe 4
3.	Sensorineural hearing loss	1
4.	Mixed hearing loss	3
	Total	100

Most common clinical finding in contralateral ear was Secretory otitis media (24%) followed by normal ears (15%). 13% showed features of adhesive otitis media. Otitis media with effusion flaccida was seen in 11% of the cases. Acute suppurative otitis media was found in 9% of the patients whereas chronic mucosal otitis also seen in 9%. 8% showed tympanosclerosis grade I Pars flaccida retraction was seen in 8% and otomycosis in 3%.

In our study, most common degree and type of hearing loss is conductive hearing loss (76%), followed by normal hearing (20%), mixed hearing loss (3%) and sensorineural hearing loss (1%).

In conductive hearing loss, out of 76 patients, 42 patients had mild conductive hearing loss, 30 patients had moderate conductive hearing loss and 4 patients had severe conductive hearing loss.

## DISCUSSION

In our study, 68 (68%) patients were adult patients and 32 (32%) were pediatric cases. The youngest patient in our study was 7 years old and the oldest patient was 55 years old. The mean age of the patients is 28.47 years. In a study conducted by Khalil et al, median age was 29 years.<sup>5</sup>

In our study, out of 100 patients 20 patients (20%) had normal hearing in contralateral ear. 76 patients (76%) had conductive hearing loss with mild conductive hearing loss in 42 patients (55.26%) which was seen in patients with grade I retraction pars tensa, grade II retraction pars tensa, few cases of acute suppurative otitis media, grade I retraction of pars flaccida and tympanosclerosis. 30

(39.47%) patients had moderate conductive hearing loss which was seen in cases with grade III pars tensa retraction some patients with chronic mucosal CSOM, few patients having otitis media with effusion, few cases of tympanosclerosis. 4 (5.27%) patients had severe conductive hearing loss which was seen in cases with adhesive otitis media, few cases of tympanosclerosis.

In a study conducted by Shireen et al, 52.4% patients presented with normal hearing in contralateral ear. 38.1% presented with mild conductive hearing loss, 4.8% with moderate and 4.8% with severe conductive hearing loss in contralateral ear.<sup>6</sup> No patients presented with mixed or sensorineural hearing loss.

In a study conducted by Damghani et al, to study the alterations in the contralateral ear in patients with chronic otitis media, 48% patients had hearing impairment in contralateral ear with 73.2% being conductive.<sup>7</sup>

In a study conducted by Chung et al, they concluded that 60% of contralateral ears had normal hearing levels while others had air bone gap upto 44 db.<sup>8</sup>

In a study conducted by Jadia et al, average pure tone audiometry of contralateral ear in unilateral squamosal otitis media was 24.24 db.<sup>9</sup>

In a study conducted by Vartiainen et al, 64% of the patients, the contralateral ears had normal ( $\leq 20$  dB) hearing levels, and in 21%, the hearing levels were  $>30$  dB.<sup>10</sup> Three patients (3%) presented with mixed hearing loss in contralateral ear and 1 (1%) patients with sensorineural hearing loss in contralateral ear.

## CONCLUSION

Patients with unilateral chronic squamosal otitis media, are likely to develop some kind of hearing abnormality in the contralateral ear. Around 80% patients have a type of hearing loss in the contralateral ear. Most common among them is conductive hearing loss.

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