

# Type of Chronic Suppurative Otitis Media as Prognostic Indicator for Contralateral Ear Pathology- An observational Study

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## Abstract

**Background:** Prevalence of chronic suppurative otitis media (CSOM) in developing countries represents a wide range from 4% to 33.3%. As the disease process does not affect both the ears simultaneously in all the cases, it is possible to identify ears in early stages of the disease process and arrest further progression by timely intervention.

**Aim:** To know whether type of chronic suppurative otitis media (CSOM) serves as prognostic indicator for contralateral ear (CLE) affection in unilateral chronic otitis media.

**Methods:** A hospital based observational study was done at a tertiary care teaching hospital in Karnataka. All patients presenting with unilateral CSOM, in the age group of 15 to 50 years, during the study period (April 2016 to May 2016) were selected for the study. A total of 140 patients who met inclusion criteria were available for the study. A detailed history, clinical examination, diagnostic nasal endoscopy, otoendoscopy, otomicroscopy, audiological evaluation and X-Ray of mastoids were done for all patients. Statistical measures applied were proportions, percentages, Chi-square test.

**Results:** Out of 140 patients, 120 were having mucosal and 20 were having squamous type of CSOM. Examination of CLE revealed abnormalities in 77 (55%) cases. In the present study, CLE was affected in 61 cases (51%) when the diseased ear was of mucosal type and 16 cases (80%) when the disease was of squamous type CSOM. The result was found to be statistically significant.

**Conclusion:** Patients with unilateral CSOM of squamous type are more likely to develop some degree of disease in the CLE. This helps in timely intervention to arrest further progress of the disease in CLE.

**Key words:** otitis media, audiometry, intervention

## Introduction

Chronic suppurative otitis media (CSOM) has been an important cause of middle ear disease since prehistoric times. The frequency of occurrence of chronic suppurative otitis media is well known. Prevalence of CSOM in developing countries represents a wide range from 4% to 33.3%<sup>1</sup>. Bilateral affection in CSOM is a well-known entity. This is more so in patients with concomitant conditions like cleft palate, rhinitis and chronic adenotonsillitis. As the disease process does not affect both the ears simultaneously in all the cases, it is possible to identify ears in early stages of

the disease process and arrest further progression by timely intervention.

## Materials and Methods

A hospital based observational study was done at Department of Otorhinolaryngology, SSIMS & RC, Davangere, a tertiary care teaching hospital in Karnataka. The study samples were selected by universal sampling method. All patients presenting with unilateral CSOM, in the age group of 15 to 50 years, during the study period of 2 months from April 2016 to May 2016 were included for the study. Patients who were willing to participate in the study and gave

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consent were selected. Patients with bilateral CSOM, traumatic perforation and with previous history of ear surgery were excluded from the study. A total of 140 patients were available for the study. After history taking and clinical examination of Ear, Nose and Throat, each patient underwent Diagnostic Nasal Endoscopy, Otoendoscopy, Otomicroscopy, Audiological evaluation like Pure Tone Audiometry and Impedance Audiometry and X-ray of the mastoids. Contralateral ear (CLE) was evaluated as normal or abnormal. Abnormal ear was again classified according to their clinical findings as fluid in the middle ear, retraction of pars tensa and pars flaccida, atelectasis and tympanosclerosis.

Written informed consent was obtained from all patients. Ethical clearance was taken from the institutional ethics committee.

## Results

Out of 140 patients 69 were males and 71 were females. Majority of the patients were in the age group of 21-30 years (42%). Right and left ears were affected equally. 120 patients were diagnosed to have mucosal type while 20 were having squamous type CSOM.

In our study 77 (55%) out of 140 cases of CSOM showed some pathology in CLE. Out of 120 cases of mucosal CSOM, CLE was affected in 61 (51%) cases and of 20 cases of squamous CSOM, CLE was affected in 16 (80%) cases. The result was found to be statistically significant ( $P$  value  $< 0.01$ ) (Table 1).

**Table 1: Type of CSOM and contralateral ear (CLE) involvement**

Type of CSOM	Number of cases	Number of CLE affected	Chi-square value
Mucosal	120	61 (51%)	$\chi^2=5.89$
Squamous	20	16 (80%)	$P < 0.01$

Among the findings in the CLE, retraction of tympanic membrane was the commonest, followed by tympanosclerotic patch in both the groups. Audiological evaluation revealed 45 (32%) patients to have conductive hearing loss in CLE. Impedance audiometry showed B type graph in 15 (10.7%) patients and C type in 14 (10%) patients in CLE.

In our study, X-ray mastoids showed normal pneumatization in 110 cases (78.5%) and sclerosis was seen in 30 cases (21%) in CLE. Out of 120 cases of mucosal CSOM, 24 cases (27%) showed sclerotic changes in CLE and out of 20 cases of squamous

CSOM, 6 cases (60%) showed sclerotic changes in CLE (Table 2).

**Table 2: X-ray findings of contralateral ear (CLE)**

Type of CSOM	Number of cases	Number of CLE with radiological changes in mastoid
Mucosal	120	24 (27%)
Squamous	20	6 (60%)

## Discussion

Inflammation and infection in middle ear is known as CSOM which is persistent and long-lasting. CSOM has varying prevalence around the world. Chronic otitis media (CSOM) is of two types, tubotympanic (mucosal) and atticotympanic (squamous). The squamous type involves the pars flaccida and is characterized by the formation of a retraction pocket in which keratin accumulates to produce Cholesteatoma. The mucosal disease is characterized by a perforation of the pars tensa<sup>2</sup>.

Limited data are currently available in the literature relating to status of the CLE in patients with CSOM. Previous studies have predominantly focused on the condition of the contralateral ear via otoscopy, but in our study we use PTA, tympanometry, otomicroscopy, diagnostic nasal endoscopy and radiography in addition to otoscopy for the evaluation of the CLE in unilateral CSOM. In our study 55% of the patients had some sort of pathology in CLE. In a study conducted by Prakash adhikari et al<sup>3</sup>, 68.4% of patients were found to have some form of abnormalities in the CLE. Sady Selaimen da Costa et al<sup>4</sup> in his study of 500 patients found that 72.2% of patients had CLE structural abnormalities. 60.4% patients presented with CSOM without cholesteatoma and in this group 69.9% had an abnormal CLE. In those with cholesteatoma, the CLE was found to be abnormal in 83.3%. The most frequent finding in both groups was retraction of tympanic membrane. In a study conducted by M. S Islam et al<sup>5</sup>, otoscopy showed 54% of patients had a problem in the contralateral ear. It was noted that like our study some patients had overlapping symptoms. The most common symptoms were perforation of the eardrum (59.2%) and plaque sclerosis (44.4%). In another study from Vartiainen E et al, among 496 patients with COM, 63% had disorders in their contralateral ear, with retraction as the most common finding followed by perforation of the tympanum<sup>6</sup>. Rosemary A et al in 1984 assessed the contralateral ears of 73 patients who had undergone canal wall down tympano-mastoidectomy

for acquired cholesteatoma and found abnormalities in 53.4% of them (pars tensa retraction being the most prevalent)<sup>7</sup>.

In our study, CLE was affected in 61 among 120 cases (51%) when the diseased ear was of mucosal type CSOM and 16 among 20 cases (80%) when the disease was of squamous type. Among findings, retraction of tympanic membrane was the commonest followed by tympanosclerotic patch in both the study groups.

The Eustachian tube (ET) appears to be central to the pathogenesis of all forms of otitis media. In our study some sort of ET pathology like mucosal edema and discharge at tubal orifice was seen in 33 patients on the side of CLE. Chronic tubal dysfunction causes the tympanic membrane sequelae like atrophy and retraction<sup>8</sup>. Nasal pathology like deviated nasal septum, rhinitis and sinusitis were found in 35 patients among 77 CLE affected cases.

In our study X-ray mastoid showed normal pneumatization in 110 cases and sclerosis in 30 cases in CLE. Out of 120 cases of mucosal CSOM, 24 cases (27%) showed sclerotic changes in CLE and out of 20 cases of squamous CSOM, 6 cases (60%) showed sclerotic changes in CLE. Mauricio noschang lopes da silva et al<sup>9</sup> in their study showed that among 75 patients, CLE showed 65.3% well-pneumatized mastoids, 6.7% diploic and 28% sclerotic mastoids. It is known that CSOM is often associated with poor mastoid pneumatization. The hypocellularity and constricted mastoid process found in cases of Cholesteatoma are the most severe sequelae of the disturbed pneumatization process caused by infection and chronic secretory otitis media, which also result in severe drum changes and chronic middle ear disease. Thus, the highly significant correlation between a constricted mastoid process and cholesteatoma is explained<sup>10</sup>. Hence, patients with hypocellular mastoid need to be followed up regularly for identifying disease process in early stage.

The value of CLE findings in patients with CSOM resides in two fundamental aspects, its contribution to understanding the pathogenesis of otitis media and its implications for treatment, follow-up and counseling for patients. This helps in timely intervention to arrest the disease process in early stages.

**Conclusion:** Patients with unilateral CSOM of squamous type are more likely to develop some degree of disease in the CLE. This helps in timely intervention to arrest further progress of the disease in CLE. Hence CLE should always be evaluated comprehensively

in patients with squamous type CSOM to efficiently diagnose any alterations.

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