

## A Study on the Incidence and Frequency of Extracranial Complications of Chronic Suppurative Otitis Media

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Received: 10-02-2023 / Revised: 15-04-2023 / Accepted: 03-05-2023

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Conflict of interest: Nil

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### Abstract

**Objectives:** The present study was to evaluate the incidence and frequency of extracranial complications of chronic suppurative otitis media in various age group patients.

**Methods:** A total of 4987 subject of chronic suppurative otitis media were included in this study. A detail clinical history and clinical examinations were conducted to all subjects. The incidence and significance of the complications and detailed type of complication was noted and reported.

**Results:** Out of 4987 patients of chronic suppurative otitis media, 100 patients had extracranial complications, that is, the rate of incidence of extracranial complication in CSOM was 2%. Out of 100 extracranial complication patients, 64% patients were belonged from rural area. Primary and below primary educated patients were 54(54%). Majorities of patients were females 61(61%). Majorities of patient 54(54%) were in age 11-20 years. 19(19%) cases were in age group of 0-10 years. 16(16%) patients of extracranial complications were in age group of 21-30 years. Most of the patients were belonged from low (52%) and below low socioeconomic class (32%). Most common complication was 33(33%) post aural abscess. 27(27%) had mastoiditis, 19(19%) patients had facial nerve paralysis, 12(12%) had petrositis and 9(9%) had post aural fistula.

**Conclusions:** The highest incidence of extracranial cranial complication of CSOM was seen in younger age patients. Females were more preponderance than males. Low socioeconomic status, low hygiene and lower literacy were the common risk factors of extracranial complications in CSOM patients. Post aural abscess and mastoiditis were the more common extracranial complications of chronic suppurative otitis media. Thus, lack of knowledge regarding the disease process and its complications in illiterate and under educated population lead to complications. So that, educations of the peoples are essential for the prevention from complication and morbidity due to CSOM. For this, we should organise the health check-up camp in rural as well as urban area for awareness and treatment of CSOM and its complications.

**Key words:** Chronic suppurative otitis media, Complications, Age, Incidence

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### Introduction

Chronic suppurative otitis media (CSOM) is the result of an initial episode of acute otitis media and is characterized by a

persistent discharge from the middle ear through a tympanic perforation. It is an important cause of preventable hearing

loss, particularly in the developing world [1].

The number of patients affected by complications of COM substantially decreased with the advent of antibiotics, but they are still encountered. Early recognition of the complications is critical for an effective treatment. Complications of chronic suppurative otitis media (COM) are classified into intracranial and extracranial complications [2].

Extracranial complications are subperiosteal abscess, labyrinthitis, facial paralysis, petrositis.<sup>10,13</sup> Intracranial complications are- meningitis, brain abscess, extradural abscess, subdural abscess and lateral sinus thrombosis. Different studies showed that extracranial complication of CSOM is more than that of intracranial complications [3,4,5,6,7,8]. Cholesteatomas are potentially dangerous because of their potential to incite resorption of bone, leading to infratemporal or intracranial complications [8].

The factors responsible for such complications in developing countries could be poverty, lack of education, unavailability of healthcare facilities and ignorance about aural symptoms. In developed countries, however, complications can be caused by antibiotic resistance, masking of symptoms by antibiotics and change in the virulence of causative organisms [9].<sup>13</sup> Objectives of our study was to evaluate the incidence and frequency of extracranial complications of chronic suppurative otitis media.

### Material & Methods

This present study was conducted in the Department of ENT, Sri Krishna Medical College, Muzaffarpur, Bihar, India during a period from January 2022 to December 2022. Entire subjects signed an informed consent approved by the institutional

ethical committee of Sri Krishna Medical College, Muzaffarpur was sought.

### Selection Criteria:

#### a) Inclusion criteria:

Patients with chronic suppurative otitis media & with extracranial complications like subperiosteal abscess, postauricular discharging sinus, labyrinthitis, facial palsy were included.

#### b) Exclusion criteria:

Patients present with acute suppurative otitis media, chronic suppurative otitis media with intracranial complications were excluded from this study.

A total of 4987 subject of chronic suppurative otitis media were included in this study. A detail clinical history and clinical examinations were conducted to all subjects. The incidence and significance of the complications and detailed type of complication was noted and reported.

### Statistical Analysis

Data was analysed by using simple statistical methods with the help of MS-Office software. All data was tabulated and percentages were calculated.

### Observations

In this present study, 4987 CSOM cases were enrolled. Out of 4987 patients of chronic suppurative otitis media, 100 patients had extracranial complications, that is, the rate of incidence of extracranial complication in CSOM was 2%. Out of 100 extracranial complication patients, 64% patients were belonged from rural area and 34(34%) were belonged from urban area. Primary and below primary educated patients were 54(54%), 35(35%) patients had middle class education. 6(6%) had secondary level education, and 5(5%) had higher secondary education.

**Table 1: Showing the incidence of extracranial complications of CSOP.**

Subject	No. of Patients with extracranial complications	Percentage
4987	100	2%

**Table 2: Showing the age wise distributions of CSOM patients with extracranial complications.**

Age group (years)	No. of patients	Percentage
0-10	19	18%
11-20	54	54%
21-30	16	17%
31-40	5	5%
41-50	4	4%
>50 years	2	2%

**Table 3: Showing the mean age of the patients who had extracranial complications.**

Age group (Years)	No. of subject	Percentage
100	40.23	10.47

In this present study, mean age of patients with extracranial complications was 40.23 years. Majorities of patient 54(54%) with extracranial complications were in age 11-20 years. 19(19%) cases were in age group of 0-10 years. 16(16%) patients of extracranial complications were in age group of 21-30 years.

**Table 4: Showing the gender wise distributions of CSOM patients with extracranial complications.**

Gender	Frequency	Percentage
Male	39	39%
Female	61	61%

In this present study, majorities of patients were females 61(61%) and 39(39%) were females.

**Table 3: Showing the socioeconomic status of CSOM patients with extracranial complications.**

Socioeconomic status	Frequency	Percentage
Upper class	01	01%
Upper middle class	03	03%
Middle class	12	12%
Above low class	32	32%
Low class	52	52%

According to the modified B G Prasad classifications, extracranial complications patients of CSOM was commonly belonged from low 52(52%) and above low socioeconomic class 32(32%).

**Table 3: Showing the patients of extracranial complications.**

Complications	No. of patients	Percentage
Facial nerve paralysis	19	19%
Petrositis	12	12%
Mastoiditis	27	27%
Post Aural Fistula	9	9%
Post Aural Abscess	33	33%

Most common complication was 33(33%) post aural abscess. 27(27%) had mastoiditis, 19(19%) patients had facial nerve paralysis, 12(12%) had petrositis and 9(9%) had post aural fistula.

### Discussions

CSOM is quite common in developing countries. Peoples of younger age group and low socioeconomic classes are more sufferer with CSOM [5,10,11].

Chronic Suppurative Otitis media has been traditionally described as a chronic inflammation of part or all of the tympanomastoid compartment comprising of eustachian tube, the tympanic cavity, the mastoid antrum and all the pneumatized spaces of temporal bone associated with perforation of the tympanic membrane and otorrhoea. The proximity of the middle ear cleft, the mastoid air cells to temporal and the intracranial compartments, places structures located in these [12] areas at increased risk of infectious complications. The development of complications in Chronic Suppurative Otitis Media is attributed to the bone eroding properties of Cholesteatoma and granulation tissue, normal anatomical openings and natural dehiscences in temporal bone, virulence of organisms, biofilm formation, patient related factors like age, immune status e.t.c. [13].

In the present study, we were assessed the 4987 cases of chronic suppurative otitis media. Among them 100 patients had extracranial complications, that is the rate of incidence of extracranial complication in CSOM was 2%. And, it was commonly seen in low (52%) and above low socioeconomic status (32%) patients.

Kangsarak et al. [2] found extracranial complications in 0.45% of the COM cases. Osma et al. [12] reported that the prevalence of extracranial complications was 1.35%.

In the present study, incidence of complication 54(54%) was more common

in young children 11-20 years. Some studies supported to our findings, according to them, incidence of complications are common in children and young adults [11,6,14]. Which were compatible with many studies [11,10,6,14].

In the present study, females 61(61%) were more suffered than males. But in other Studies males had higher preponderance for complications, when compared to females. [5-7] Some reported predominance of females [15-17].

Acute otitis media (AOM) and chronic otitis media (COM) represented severe risks to children owing to the potential of intra and extracranial complications. As a result of the advent of antibiotics, there has been significant decrease in incidence, with significant decrease in intracranial complications (ICC) from 2.3% to 0.04% and in mastoiditis from 20% to less than 0.5%. However, ICC still represent a risk situation because of high mortality rate (36%) [18,19]. Even though it is less common than simple chronic otitis media, cholesteatomatous otitis media (CMOM) is normally associated with complications because of its invasive potential [20]. Cholesteatoma with or without granulation tissue is the commoner causative factor for the development of complication in CSOM [5,10,4,7].

CSOM produces chronic mastoiditis by contiguous spread [21]. Erosion of the walls of the middle ear and mastoid cavity, which is rare, leads to exposure of the facial nerve, jugular bulb, lateral sinus, membranous labyrinth and temporal lobe dura. This in turn leads to such complications as facial nerve paralysis, lateral sinus thrombosis, labyrinthitis, meningitis and brain abscess [22,23]. Contiguous or haematogenous spread of infection to the brain produces similar, permanently disabling and potentially fatal complications [24].

In the present study, most common complication was 33(33%) post aural abscess. 27(27%) patients had mastoiditis,

19(19%) CSOM patients had facial nerve paralysis. 12(12%) CSOM patients had petrositis and 9(9%) had post aural fistula.

Siba P Dubey et al [34] found commonest extracranial complications were mainly mastoid abscess in 26 (37%), post auricular fistula in 17(24%) and facial palsy in 10(14%) cases.

Goldstein NA et al [35] reviewed their experience with 100 children between 1980 and 1995 with intratemporal complication of acute otitis media. 72 patients had acute mastoiditis. Maximum patients reporting to OPD of VSS medical college were from remote areas and they came in a neglected state after taking inadequate treatment. [25]

The multifactorial nature of otitis media must be stressed. Inadequate antibiotic treatment, frequent upper respiratory tract infections, nasal disease [26], and poor living conditions with poor access to medical care [33] are related to the development of CSOM [26-29]. Poor housing, hygiene and nutrition are associated with higher prevalence rates, and improvement in these aspects was found to halve the prevalence of CSOM in Maori children between 1978 and 1987 [30]. Proximity to a health care facility significantly reduced the otitis media attack rate among Arizona Indian children living in reservations [31]. Bottle-feeding [32], passive exposure to smoking, attendance in congested centres such as day-care facilities [33], and a family history of otitis media are some of the risk factors for otitis media [32,36].

### Conclusions

This present study concluded that the highest incidence of extracranial cranial complication of CSOM was seen in younger age patients. Females were more preponderance than males. Low socioeconomic status, low hygiene and lower literacy were the common risk factors of extracranial complications in CSOM patients. Post aural abscess and mastoiditis were the more common extracranial

complications of chronic suppurative otitis media. Thus, lack of knowledge regarding the disease process and its complications in illiterate and under educated population lead to complications. So that, educations of the peoples are essential for the prevention from complication and morbidity due to CSOM. For this, we should organise the health check-up camp in rural as well as urban area for awareness and treatment of CSOM and its complications.

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