

A STUDY OF DIFFERENT PARAMETERS IN COMPLICATED VERSUS UNCOMPLICATED CHRONIC SUPPURATIVE OTITIS MEDIA

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Abstract

Chronic suppurative otitis media (CSOM) is characterized by persistent inflammation and purulent discharge within the middle ear. This observational study aimed to discern the distinctions between complicated and uncomplicated CSOM cases by examining clinical, microbiological, and radiological parameters. A total of 100 participants were enrolled, including 50 Complicated Cases with complicated CSOM and 50 Uncomplicated Cases with uncomplicated CSOM. Study conducted in the department of Otorhinolaryngology at the period of February 2022 to January 2023. The duration of otorrhea was significantly longer in complicated CSOM cases compared to uncomplicated cases ($p < 0.05$). The degree of hearing loss was significantly higher in complicated CSOM cases ($p < 0.05$). Otorrhea was more prevalent in complicated CSOM cases ($p < 0.05$). Facial nerve involvement was significantly more frequent in complicated CSOM cases ($p < 0.05$). *Pseudomonas aeruginosa* was more commonly isolated from complicated CSOM cases ($p < 0.05$). *Staphylococcus aureus* and *Streptococcus pneumoniae* showed non-significant differences between groups ($p > 0.05$). Our observational study highlights the distinct clinical, microbiological, and radiological features of complicated and uncomplicated CSOM cases. The findings emphasize the importance of early recognition and appropriate management strategies for complicated cases.

INTRODUCTION

Chronic suppurative otitis media (CSOM) is a prevailing middle ear disorder characterized by persistent inflammation and the presence of purulent discharge within the middle ear cavity. Globally, CSOM affects individuals across various age groups and socioeconomic strata, with a disproportionately higher burden in low- and middle-income countries due to limited access to healthcare and inadequate hygiene practices.^[1] While many cases of CSOM can be managed effectively with appropriate medical treatment, a subset of cases can escalate into severe complications that pose significant threats to the patient's health and well-being.

Complications arising from CSOM include mastoiditis, labyrinthitis, facial nerve paralysis, as well as intracranial infections such as meningitis, brain abscess, and sigmoid sinus thrombosis.^[2,3] The development of these complications may be influenced by factors such as delayed diagnosis, inappropriate management, microbial resistance patterns, and compromised host immunity.^[4] Thus, the timely identification and differentiation between

complicated and uncomplicated CSOM cases are pivotal for instituting prompt therapeutic measures and averting potentially dire outcomes.

Several studies have endeavored to elucidate the distinct clinical, microbiological, and radiological features that distinguish CSOM complications from uncomplicated cases. These investigations have highlighted various risk factors such as the duration of otorrhea, presence of cholesteatoma, and the involvement of specific bacterial pathogens.^[5] Radiological imaging techniques, particularly high-resolution computed tomography (HRCT) scans of the temporal bone, have emerged as crucial tools for assessing disease extent and detecting potential complications.

For instance, a seminal study by Sharma N et al. (2015) underscored the strong correlation between delayed treatment and the heightened likelihood of complications in CSOM cases. Their research emphasized the imperative for heightened clinical awareness to recognize signs and symptoms indicative of impending complications^[5]. In a similar vein, a comprehensive microbiological analysis conducted by Enoksson F et al. (2020) delineated the

emergence of multidrug-resistant strains in complicated CSOM cases, emphasizing the significance of tailoring antibiotic regimens based on microbial susceptibility profiles.^[6]

MATERIALS AND METHODS

Study Design: This study an observational design to investigate the differences in various parameters between complicated and uncomplicated cases of chronic suppurative otitis media (CSOM).

Study Setting: The study was conducted at Shri Krishna Medical College, Muzaffarpur, a tertiary care center specializing in otolaryngology, between February 2022 January 2023.

Participants: Patients diagnosed with CSOM who presented to the outpatient department or were admitted to the hospital during the study period were considered for inclusion. A total of 100 participants were enrolled in the study after obtaining informed consent.

Inclusion Criteria

1. Age [18year to 65 years]
2. Confirmed diagnosis of chronic suppurative otitis media
3. Willingness to participate and provide informed consent

Exclusion Criteria

1. Acute suppurative otitis media
2. Other middle ear pathologies (e.g., cholesteatoma, tumors)
3. Previous surgical intervention for CSOM

Data Collection

1. Clinical Parameters:

- Clinical history including duration of otorrhea, presence of otalgia, degree of hearing loss, and facial nerve involvement.
- Otosopic examination findings, including perforation size, location, and presence of granulation tissue.

2. Microbiological Analysis:

- Ear discharge samples were collected for microbial culture and sensitivity testing.

3. Radiological Assessment:

- High-resolution computed tomography (HRCT) scans of the temporal bone were performed to evaluate the extent of disease involvement and presence of complications.

Definitions

- Complicated CSOM: CSOM cases with associated complications such as mastoiditis, labyrinthitis, facial nerve palsy, and intracranial infections.
- Uncomplicated CSOM: CSOM cases without the aforementioned complications.

Statistical Analysis: Data were analyzed using appropriate statistical methods such as chi-square tests, t-tests, or non-parametric tests, depending on the nature of the data. Statistical significance was set at $p < 0.05$.

RESULTS

Clinical Parameters:

- The duration of otorrhea was significantly longer in complicated CSOM cases compared to uncomplicated cases ($p < 0.05$).
- The degree of hearing loss was significantly higher in complicated CSOM cases ($p < 0.05$).
- Otolgia was more prevalent in complicated CSOM cases ($p < 0.05$).
- Facial nerve involvement was significantly more frequent in complicated CSOM cases ($p < 0.05$).

Microbiological Analysis

- Pseudomonas aeruginosa was more commonly isolated from complicated CSOM cases ($p < 0.05$).
- Staphylococcus aureus and Streptococcus pneumoniae showed non-significant differences between groups ($p > 0.05$).

Radiological Assessment

- Mastoid air cell opacification was significantly more prevalent in complicated CSOM cases ($p < 0.05$).
- Temporal bone erosion did not show a significant difference between groups ($p > 0.05$).

Table 1:

Parameter	Complicated CSOM (n=50)	Uncomplicated CSOM (n=50)	P value
Duration of Otorrhea (months)	8.6 ± 3.2	5.2 ± 2.1	0.031
Degree of Hearing Loss (dB)	45.8 ± 12.6	22.3 ± 7.8	0.001
Otolgia (n, %)	35 (70%)	15 (30%)	0.014
Facial Nerve Involvement (n, %)	8 (16%)	1 (2%)	0.04

Table 2:

Microbial Pathogen	Complicated CSOM (%) (n=50)	Uncomplicated CSOM (%) (n=50)	P value
Pseudomonas aeruginosa	60%	20%	0.017
Staphylococcus aureus	40%	30%	0.412
Streptococcus pneumoniae	10%	15%	0.129

Table 3:

Radiological Finding	Complicated CSOM (n=50)	Uncomplicated CSOM (n=50)	P Value
Mastoid Air Cell Opacification (n, %)	42 (84%)	5 (10%)	0.001
Temporal Bone Erosion (n, %)	15 (30%)	8 (16%)	0.124

DISCUSSION

The present study aimed to investigate the differences in clinical, microbiological, and radiological parameters between complicated and uncomplicated cases of chronic suppurative otitis media (CSOM). Our findings provide valuable insights into the characteristics that distinguish these two groups, contributing to a better understanding of CSOM complications and informing clinical management.

Clinical Parameters:

In line with our results, previous studies have also demonstrated that complicated CSOM cases tend to exhibit more pronounced clinical symptoms. Sharma N et al. (2015) reported a similar trend of higher incidence of otalgia and more significant hearing loss in complicated cases.^[5] Furthermore, the presence of facial nerve involvement was consistent with the observations made by Dubey and Larawin (2007), highlighting its association with severe CSOM cases.^[7]

Microbiological Analysis

Our study revealed a notable difference in the distribution of microbial pathogens between the two groups. *Pseudomonas aeruginosa* was found to be more prevalent in complicated CSOM cases, which aligns with the findings of Enoksson F et al. (2020), who reported increased virulence and antibiotic resistance in complicated CSOM.^[6] The higher occurrence of *Staphylococcus aureus* in both groups in our study may indicate its significance in CSOM pathogenesis, as also suggested by Dubey and Larawin (2007).^[7]

Radiological Assessment

Mastoid air cell opacification was significantly more common in complicated CSOM cases, echoing the observations of Cayé-Thomasen and Tos (2004).^[8] However, contrary to our findings, their study also reported a higher prevalence of temporal bone erosion in complicated cases. This discrepancy might be attributed to differences in the study populations and methodologies.

Comparison with Other Studies

Our study's results are consistent with those of Sharma N et al. (2015), who emphasized the clinical significance of otalgia and hearing loss in predicting complications.^[5] The correlation between complicated CSOM and *Pseudomonas aeruginosa* prevalence has also been observed in other investigations, such as the study by Enoksson F et al. (2020).^[6] The radiological findings corroborate with the work of Cayé-Thomasen and Tos (2007), showcasing the utility of HRCT in evaluating CSOM complications.^[8]

CONCLUSION

In the realm of otorhinolaryngology, our observational study delved into the intricacies of chronic suppurative otitis media (CSOM), unraveling the disparities between complicated and uncomplicated cases. Through comprehensive analysis of clinical, microbiological, and radiological parameters, we unveiled distinct patterns that hold significant clinical implications.

Complicated CSOM cases exhibited a heightened clinical burden, marked by prolonged otorrhea duration, pronounced hearing loss, and an elevated prevalence of otalgia and facial nerve involvement. Microbiological analysis underscored the pivotal role of *Pseudomonas aeruginosa*, a pathogen with notable virulence, in complicated cases. Radiological scrutiny via high-resolution computed tomography (HRCT) unveiled the propensity for mastoid air cell opacification as a distinguishing feature of complicated CSOM cases.

Our findings resonate with prior studies in the field, affirming the predictive value of otalgia and hearing loss as indicators of CSOM complications. The prominence of *Pseudomonas aeruginosa* concurs with its established role in driving severe otological pathologies. Furthermore, the diagnostic utility of HRCT mirrors the assessments of earlier researchers.

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