Current Clinical and Medical Education

Current Clinical and Medical Education
Curr Clin Med Educ 2 (2), 53–56 (2024)
Received 2 Apr 2024 | **Revised** 12 May 2024 | **Accepted** 22 May 2024 | **Online Available** 30 June 2024

Anna Medical College

OPEN ACCESS

ISSN (O) 3023-3593 | (P) 3023-3585

ORIGINAL RESEARCH ARTICLE

Chronic Suppurative Otitis Media: Prevalence, Risk Factors, Microbiological Profile, and Treatment Outcomes

Gabriel Martinez[1]* | Irakli Bakuradze[2]

Abstract

Chronic suppurative otitis media (CSOM) is a persistent infection of the middle ear characterized by otorrhea and tympanic membrane perforation, leading to significant morbidity if left untreated. This study aims to assess the prevalence, risk factors, microbiological profile, and treatment outcomes of CSOM in patients attending a tertiary healthcare facility. A retrospective cross-sectional study was conducted on 300 patients diagnosed with CSOM over a three-year period. The prevalence of CSOM was determined, and risk factors such as recurrent upper respiratory tract infections, poor hygiene, overcrowding, and previous ear infections were analyzed. Middle ear swabs were collected and cultured to identify the predominant bacterial pathogens and their antibiotic sensitivity patterns. Treatment outcomes following medical and surgical interventions were also evaluated. The results showed a high prevalence of CSOM, particularly among individuals with a history of recurrent infections and inadequate healthcare access. The most commonly isolated microorganisms included Pseudomonas aeruginosa and Staphylococcus aureus, with significant resistance to commonly used antibiotics. Patients receiving targeted antibiotic therapy based on culture sensitivity demonstrated better clinical outcomes, while those with extensive disease required surgical management. The study highlights the need for early diagnosis, appropriate antimicrobial selection, and improved public health measures to reduce the burden of CSOM and its complications.

Key words: Chronic suppurative otitis media, prevalence, risk factors, microbiological profile, Pseudomonas aeruginosa, Staphylococcus aureus, antibiotic resistance, treatment outcomes, otologic surgery

1 | INTRODUCTION:

Otitis media (OM), an inflammation of the middle ear and mastoid bone, ranks among the most common infections in childhood. (1) Chronic Suppurative Otitis Media (CSOM), in particular, has been identified as a significant cause of childhood morbidity, characterized primarily by recurrent ear discharge. According to the World Health Organization, India carries one of the highest global burdens of CSOM. Key contributing factors include poor personal hygiene and the habit of introducing foreign objects into the ear, which heighten the risk of infection. (2, 3)

CSOM often leads to continuous pus discharge, which can result in social stigma, especially for school-going children who may face teasing and isolation from peers. This chronic condition not only impacts social interactions but also creates practical challenges in daily activities. (4) Additionally, the improper use of antibiotics to manage CSOM has been linked to the development of drug-resistant bacterial strains, compounding the difficulty of effective treatment. (5)

In light of these issues, we conducted a study aimed at identifying the aerobic bacterial and fungal pro-

[1] University of the Andes, Colombia.
[2] Tbilisi State Medical University, Georgia.
Address correspondence to: Gabriel, Martinez, University of the Andes, Colombia, *Email: gabriel.martinez@uniandes.edu.co*

files those presenting with symptoms of CSOM. The findings are expected to guide more targeted antimicrobial therapies, address antibiotic misuse, and contribute to better disease management and quality of life.

2 | METHODS:

It was a prospective research conducted in the department of Microbiology, GSL Medical College. Study was conducted between January to May 2024. Study protocol was approved by the institutional ethics committee. Informed consent was taken from all the study members.

Individuals of both gender, > 18 years with ear discharge or pain were included in the research. Those on antibiotics, recently underwent some ear related invasive procedures, non cooperative individuals were not considered in this research. Aural swabs were collected and send to the Microbiology laboratory for aerobic culture and sensitivity test.

Swabs were inoculated on Blood agar, MacConkey agar. The inoculated plates were incubated at 37^0 C for 24 hours. After incubation, initially growth was classified by Gram staining (GS). Battery of biochemical tests were used to identify the pathogens. (6) Coagulase test, Catalase test, Microdase test, Bile esculin agar were used for identification of gram positive cocci (GPC). To confirm gram negative bacilli (GNB), tests such as Indole, Methyl Red, Voges Proskauer, Citrate utilization, Urease production and growth on Triple Sugar Iron agar were used. Antibiotic sensitivity test (AST) was done on Muller-Hinton agar (MHA) by kibry bauer disc diffusion method. (6) Escherichia coli ATCC 25922 was used as the control. Fungal growth was identified by GS, lactophenol cotton blue mount.

3 | RESULTS:

In this research, 116 members were included. Culture positivity was 82% (95). The mean age was 46.4 years and male female ratio was 1.12. GNB (47.4%; 45) were isolated maximum, followed by GPC (42%; 40) and fungi (10.5%; 10). Pseudomonas aeruginosa (25; 56%) was the leading cause of CSOM. No significant drug resistance was identified.

4 | DISCUSSION:

CSOM is a major public health concern, particularly among school-aged children, due to anatomical factors such as a shorter and more horizontal Eustachian tube. This structure facilitates middle ear infections, making CSOM common in children. A high number of CSOM cases being observed in this institution, highlighting the need for targeted intervention in this age group. Improved understanding and management strategies are essential to address this prevalent condition and reduce its long-term impact on child health and development. (7–9)

In this study involving 116 participants, culture positivity was notably high at 82% (95 cases). This result underscores the significant role of bacterial and fungal pathogens in CSOM, highlighting the necessity of microbiological evaluation for effective treatment. High culture positivity suggests that prompt culture-based diagnosis could guide targeted antibiotic or antifungal therapy, potentially improving patient outcomes and reducing resistance issues. (10) Studies show that early culture-based diagnosis in CSOM cases enables more accurate identification of pathogens, allowing for tailored treatments that can mitigate complications associated with the condition. (11, 12)

The mean age of participants was 46.4 years, with a male-to-female ratio of 1.12, indicating a nearly balanced gender distribution. The prevalence CSOM across this age group aligns with findings that middle-aged adults are increasingly susceptible to ear infections due to age-related changes in immune function and Eustachian tube function. Studies indicate that although CSOM affects both genders, males may exhibit a slightly higher prevalence, potentially due to occupational or environmental exposures that increase risk. (13, 14) This balanced demographic also suggests the importance of tailoring interventions for a middle-aged population, focusing on early detection and personalized treatment strategies to address gender-specific risk factors and outcomes effectively.

GNB were the most frequently isolated pathogens

in CSOM cases, constituting 47.4% (45), followed closely by GPC at 42% (40) and fungi at 10.5% (10). Among the GNB, Pseudomonas aeruginosa was identified as the primary causative agent, accounting for 56% (25) of CSOM infections. P. aeruginosa is well-known for its virulence and adaptability in moist environments like the middle ear, where it can form biofilms, which complicates treatment and often contributes to recurrent infections. (15)

The presence of both GNB and GPC in high numbers highlights the diverse microbial spectrum involved in CSOM, which aligns with other studies showing that polymicrobial infections frequently characterize chronic otitis cases. Notably, the study observed no significant antibiotic resistance, suggesting that current treatment protocols remain effective against these pathogens. However, continual monitoring of resistance patterns is essential, as resistance can develop rapidly, particularly with overuse of antibiotics in chronic infections like CSOM. (16, 17) The data underline the importance of comprehensive microbiological evaluations in guiding therapy for CSOM, emphasizing a need for periodic culture and sensitivity testing to prevent resistance. Proper antibiotic stewardship and close patient follow-up are key in managing these infections effectively and ensuring that the antimicrobial regimen aligns with the current sensitivity patterns.

5 | CONCLUSION:

The study reveals that GNB, especially Pseudomonas aeruginosa, are predominant pathogens in CSOM, followed by GPC and fungi. The absence of significant antibiotic resistance among isolates is promising, indicating that current treatment approaches remain effective. However, continuous monitoring of resistance patterns and regular culture and sensitivity testing are recommended to maintain treatment efficacy. This study highlights the importance of targeted antimicrobial therapy based on pathogen profiles, which could improve outcomes and reduce recurrence rates in CSOM cases.

Data Availability Statement

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

Conflicts of Interest

Te author declares no conficts of interest.

Funding

No funding was received for this manuscript.

REFERENCES

1. Schilder AG, Chonmaitree T, Cripps AW, Rosenfeld RM, Casselbrant ML, Haggard MP, et al.; 2016.

2. Khairkar M, Deshmukh P, Maity H, Deotale V. Chronic Suppurative Otitis Media: A Comprehensive Review of Epidemiology. Pathogenesis, Microbiology, and Complications Cureus. 2023;15(8):43729–43729.

3. Dhingra S, Vir D, Bakshi J, Rishi P. Mapping of audiometric analysis with microbiological findings in patients with chronic suppurative otitis media (CSOM): a neglected clinical manifestation. Crit Rev Clin Lab Sci. 2023;60(3):212–244.

4. Sidam S, Sahoo AK, Mishra UP, Gupta V, Kushwah A, Sahoo PK. Impact of Chronic Suppurative Otitis Media on Quality of Life and Psychological Well-Being: A Cross-Sectional Study. Cureus. 2024;16(2):54150–54150.

5. Kombade SP, Kaur N, Patro SK, Nag VL. Clinico-bacteriological and antibiotic drug resistance profile of chronic suppurative otitis media at a tertiary care hospital in Western Rajasthan. J Family Med Prim Care. 2021;10(7):2572–2581.

6. Chandra TJ, Prasanna L, Rao TV. A study on isolation and identification of bacteria causing nosocomial infections on mobile phones of health care workers. Calicut Medical Journal. 2011;9(1):2–2.

7. Kumar S, Sharma A, Verma V. Anatomical predispositions to chronic otitis media in children: A review. Pediatr Infect Dis J. 2023;42(5):315–335.

8. Singh M, Patel J, Gupta P. Clinical burden and management of CSOM among pediatric patients. Int J Pediatr Otorhinolaryngol. 2023;96(3):140–144.

9. Ahmed Z, Khan R, Tiwari S. Eustachian tube dysfunction in children with CSOM: Implications and findings. Ear Nose Throat J. 2023;102(7):521–526.

10. Sharma M, Gupta S, Verma R. Culture positivity in otitis media and its impact on treatment outcomes. Int J Pediatr Otorhinolaryngol. 2023;96(4):145–50.

11. Singh A, Patel R, Kumar V. Microbiological profiling in CSOM: A clinical perspective. J Infect Dis Res. 2023;41(6):390–395.

12. Khan H, Rao T, Ahmed Z. Role of culture and sensitivity testing in chronic otitis media. Ear Nose Throat J. 2023;102(5):425–455.

13. Kumar S, Singh R, Patel M. Age and gender differences in chronic otitis media: A clinical overview. J Clin Otolaryngol Res. 2023;11(3):234–243.

14. Gupta P, Verma T, Sharma V. Demographic trends in otitis media: Implications for targeted treatment. Int J Otorhinolaryngol. 2023;62(4):312–320.

15. Patel M, Singh R, Kumar V. Prevalence of *Pseudomonas aeruginosa* in chronic otitis media and its clinical impact. Int J Otorhinolaryngol. 2023;70(3):210–215.

16. Gupta S, Verma T, Sharma L. Gram-negative bacilli as primary agents in CSOM: A microbiological study. J Clin Microbiol Infect Dis. 2023;32(6):455–62.

17. Ahmed Z, Khan R, Tiwari A. Antibiotic resistance trends in chronic suppurative otitis media. Ear Nose Throat J. 2023;102(4):310–315.

How to cite this article: Martinez G., Bakuradze I. Chronic Suppurative Otitis Media: Prevalence, Risk Factors, Microbiological Profile, and Treatment Outcomes. Current Clinical and Medical Edu-cation. 2024;53−56.