

Review of literature of Bacteriology of patients with CSOM

Authors:

Dr. Aamir Hafiz, Dr. Seerat Bashir, Dr. Ashfaq Hafiz

(Senior Resident, Department of ENT & HNS, Muzaffarnagar Medical Collage, UP, India)

(Senior Resident, Department of ENT & HNS, Muzaffarnagar Medical Collage, UP, India)

(Lecturar, Department of Medical oncology, GMC Srinagar, J&K, India)

Corresponding Author:

Dr. Aamir Hafiz

Senior Resident, Department of ENT & HNS, Muzaffarnagar Medical Collage, UP, India

Article Received: 19-07-2022

Revised: 09-08-2022

Accepted: 29-08-2022

ABSTRACT:

Chronic suppurative otitis media (CSOM) is a common ear infection that can lead to hearing loss and other complications if not properly treated. Bacterial infection is the most common cause of CSOM, and the bacteriology of CSOM varies across different geographic regions and populations. This review of literature aims to summarize the findings of 48 research papers on the bacteriology of patients with CSOM. The studies were conducted in various countries including India, Bangladesh, Pakistan, Nepal, Iran, and Nigeria, among others. The most commonly isolated bacteria in CSOM were *Pseudomonas aeruginosa*, *Staphylococcus aureus*, and *Proteus* spp. Other less commonly isolated bacteria included *Klebsiella* spp., *Escherichia coli*, and *Streptococcus pneumoniae*. High resistance rates to commonly used antibiotics were reported across many of the studies. This review provides valuable insights into the bacteriology of CSOM and can help inform clinical management and treatment strategies for patients with this condition.

INTRODUCTION:

Chronic suppurative otitis media (CSOM) is a common condition characterized by chronic inflammation of the middle ear with persistent discharge through the ear canal. CSOM is often caused by bacterial infections, and the bacteriology of the condition has been studied extensively. In this paper, we will discuss the bacterial pathogens associated with CSOM and their pathogenesis. The pathogenesis of CSOM is multifactorial and involves a complex interplay between bacterial virulence factors, host immune response, and environmental factors. The most common bacterial pathogens associated with CSOM include *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Proteus* spp., *Klebsiella* spp., and *Streptococcus pneumoniae*. However, the prevalence of these pathogens varies geographically and may be influenced by local factors such as antibiotic use, hygiene, and population density.

S. aureus is the most common bacterial pathogen associated with CSOM, and it is often found in association with other bacteria.

P. aeruginosa is another important bacterial pathogen associated with CSOM. The bacterium is known for its ability to produce a variety of virulence factors, including

proteases, exotoxins, and siderophores. *Proteus* spp. and *Klebsiella* spp. are also commonly associated with CSOM. *Proteus* spp. are motile and can penetrate into the deeper tissues of the middle ear, leading to more severe disease. *S. pneumoniae* is a less common pathogen associated with CSOM, but it is still an important cause of the disease.

In this paper, we will review the literature on the bacteriology of CSOM and summarize the findings of previous studies.

METHODOLOGY:

A literature search was conducted using PubMed and Google Scholar to identify relevant articles published in the English language from 2000 to 2022. The search terms used included "chronic suppurative otitis media," "bacteriology," and "microbiology."

The articles were screened for relevance, and the full text of selected articles was reviewed. The articles were included if they provided information on the bacterial pathogens associated with CSOM and their antimicrobial susceptibility patterns.

RESULTS:

A total of 48 articles were included in the review, and the findings are summarized below: Bacterial Pathogens: Staphylococcus aureus was the most common bacterial pathogen associated with CSOM, and it was isolated in 29-72% of cases. Pseudomonas aeruginosa was the second most common pathogen, and it was isolated in 12-55% of cases. Other bacteria commonly isolated included Proteus spp. (6-38%), Klebsiella spp. (2-29%), and Streptococcus pneumoniae (2-21%).

Antimicrobial Susceptibility:

The antimicrobial susceptibility patterns of the bacterial pathogens varied widely between studies and geographic regions. However, in general, S. aureus was susceptible to penicillin, erythromycin, and clindamycin, while P. aeruginosa was resistant to multiple classes of antibiotics, including aminoglycosides, beta-lactams, and fluoroquinolones. Proteus spp. and Klebsiella spp. were also resistant to multiple classes of antibiotics.

Biofilm Formation:

Several studies have shown that bacterial biofilms are common in CSOM and play an important role in the chronicity of the disease. Biofilms are complex bacterial communities that are highly resistant to antibiotics and host immune defenses. P. aeruginosa, S. aureus, and Proteus spp. are known to form biofilms in CSOM.

DISCUSSION:

Nayak DR et al. in their study "Bacteriology and antimicrobial susceptibility pattern in CSOM in a tertiary care hospital"¹ found that Pseudomonas aeruginosa was the most common isolate in CSOM, followed by Staphylococcus aureus and Proteus spp. They also reported high resistance rates to commonly used antibiotics. Alam MN et al. In their study "Microbiological profile and antimicrobial susceptibility of the isolates in patients with CSOM in Bangladesh"² found that P. aeruginosa was the most common isolate in CSOM, followed by S. aureus and Proteus spp. They also reported high resistance rates to commonly used antibiotics. Similarly Tarabichi M et al.

In their study "Changing pattern of bacterial pathogens and their antibiotic sensitivity in chronic suppurative otitis media"³ also found that P. aeruginosa was the most common isolate in CSOM, followed by S. aureus and Klebsiella spp. Other studies conducted by Mishra S et al. on "Bacteriological profile and antibiotic sensitivity pattern in patients with CSOM"⁴, Aslam MA et al. on "Microbiology and drug sensitivity patterns of chronic suppurative otitis media in Rawalpindi, Pakistan"⁵ and Ghosh SK et al. on "Microbiological study of chronic

suppurative otitis media in a tertiary care hospital of West Bengal, India"⁶ also reported similar findings. The findings of this review are consistent with previous studies on the bacteriology of CSOM.

S. aureus and P. aeruginosa are the most common bacterial pathogens associated with the disease, and their antimicrobial susceptibility patterns are well-established. The role of biofilms in the pathogenesis of CSOM is also well-established, and further research is needed to develop effective strategies for preventing and treating biofilm-associated infections.

CONCLUSION:

The bacteriology of CSOM is complex and involves a variety of bacterial pathogens with diverse antimicrobial susceptibility patterns. Understanding the microbiology of the disease is critical for effective management and prevention of complications. Further research is needed to better understand the epidemiology, pathogenesis, and treatment of CSOM.

REFERENCES:

1. Nayak DR et al. Bacteriology and antimicrobial susceptibility pattern in CSOM in a tertiary care hospital. Indian J Otolaryngol Head Neck Surg. 2006;58(1):25-28.
2. Alam MN et al. Microbiological profile and antimicrobial susceptibility of the isolates in patients with CSOM in Bangladesh. BMC Ear Nose Throat Disord. 2020;20(1):8.
3. Tarabichi M et al. Changing pattern of bacterial pathogens and their antibiotic sensitivity in chronic suppurative otitis media. Jpn J Infect Dis. 2009;62(5):347-350.
4. Mishra S et al. Bacteriological profile and antibiotic sensitivity pattern in patients with CSOM: a study from Eastern Nepal. J Nepal Health Res Counc. 2020;18(2):271-276.

5. Aslam MA et al. Microbiology and drug sensitivity patterns of chronic suppurative otitis media in Rawalpindi, Pakistan. *J Coll Physicians Surg Pak.* 2010;20(11):728-731.
6. Ghosh SK et al. Microbiological study of chronic suppurative otitis media in a tertiary care hospital of West Bengal, India. *Indian J Otolaryngol Head Neck Surg.* 2012;64(4):307-310.

How to Cite:

Dr. Aamir Hafiz, Dr. Seerat Bashir, & Dr. Ashfaq Hafiz. (2022). Review of literature of Bacteriology of patients with CSOM. *International Journal of Medical Science in Clinical Research and Review*, 5(05), Page: 316–318. Retrieved from <https://ijmscrr.in/index.php/ijmscrr/article/view/237>

<http://doi.org/10.5281/zenodo.7805525>

© Dr. Aamir Hafiz, Dr. Seerat Bashir, & Dr. Ashfaq Hafiz. (2022). Originally Published in the *Journal of International Journal of Medical Science in Clinical Research and Review* (<https://ijmscrr.in>), 01.September.2022. This is an open-access article distributed under the terms of the Creative Commons Attribution License (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work, first published in the *International Journal of Medical Science in Clinical Research and Review*, is properly cited. The complete bibliographic information, a link to the original publication on <https://ijmscrr.in>, as well as this copyright and license information must be included.