



STUDY OF KOH MOUNT IN CHRONIC DISCHARGING EAR

Otorhinolaryngology

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ABSTRACT

Chronic suppurative otitis media, sometimes referred to as chronic otitis media, is a persistent infection of the middle ear in which the tympanic membrane is not intact. Chronic inflammation of the mastoid cavity and middle ear is a hallmark of this illness. Over the course of two to six weeks, chronic or persistent otorrhea is caused by a ruptured tympanic membrane. In addition to viruses, bacteria frequently cause children's chronic suppurative otitis media. Usually, a polymicrobial infection is the reason. In this pathology, *Staphylococcus aureus* (MRSA) is the most prevalent bacterium. Other bacteria that can cause the illness include *Fusobacterium* species, *Proteus* species, *Klebsiella* species, *Bacteroides* species, and *Pseudomonas aeruginosa*. *Aspergillus* species are less frequent, while *Candida* species are more prevalent in people with impaired immune systems.

KEYWORDS

Fungal, Chronic Suppurative Otitis Media (CSOM), KOH

INTRODUCTION

Chronic suppurative otitis media is a long-standing infection of a part of whole of the middle ear cleft characterized by ear discharge and permanent perforation. Globally, it affects 65 to 330 million people, with around half experiencing hearing loss¹.

Fungal infections occur in CSOM due to the moist humid environment created by persistent ear discharge, epithelial debris and potentially altered PH. Fungal infection contributes to chronic ear discharge in several ways like persistent inflammation, moisture retention, debris accumulation, delayed healing. Otomycosis is typically caused by fungi like *Aspergillus* species, *Candida*, *Mucor*, *Rhizopus*, and *Penicillium*. Risk factors include chronic ear infections, ear drops, swimming, immunosuppression, and hormonal changes. Early diagnosis and treatment of fungal otitis media are crucial to prevent complications.

The KOH mount is a valuable diagnostic tool for detecting fungal infections. This study aimed to assess the incidence of fungal otitis media in patients at a tertiary care center and various symptoms related to it.

The present study was aimed to speculate the presence of fungal flora responsible for the chronicity of persistent ear discharge among patients who attended the ENT department of our hospital a tertiary care Centre.

Methodology

The study was conducted in a tertiary care hospital within the Department of Otorhinolaryngology, MGM medical college and Hospital, Chh. Sambhaji Nagar, Maharashtra over a period of 6 months. (January 2024 - July 2024)

Inclusion Criteria:

- All patients of either sex attending ENT OPD with ear discharge secondary to chronic suppurative otitis media (COM) and consenting for the study.

Exclusion Criteria:

- Patients with a history of recent use of ear drops.
- All patients with ear discharge not related to chronic otitis media, such as otitis externa, cholesteatoma and Otomycosis.
- A total of 100 patients with chronic otitis media (COM), who had no history of using ear drops for the last two weeks were selected. Using sterile swabs without touching EAC ear discharge was taken from the middle ear, then sent to the microbiology laboratory for potassium hydroxide (KOH) mount.

- In the laboratory, the samples were examined microscopically (in 10% KOH preparations smears) for the presence of budding yeast cells, fungal hyphae (septate or aseptate), and spores, pus cells.

KOH mount reports were generated, and patients with KOH-positive reports were noted.



Figure 1: Ear Discharge



Figure2: Sterile Swab Stick

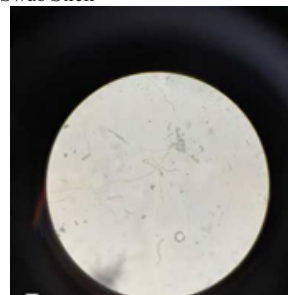
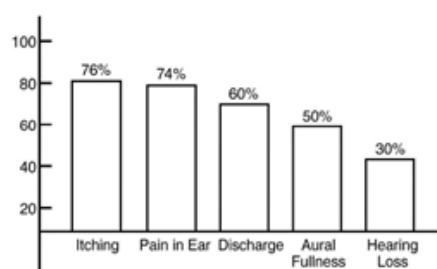
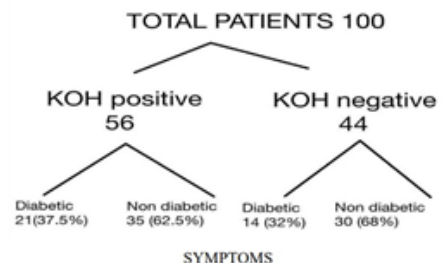


Figure 3: Fungal Hyphae Seen In Koh Mount

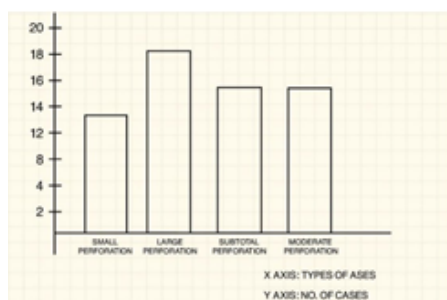
RESULTS:

In this study, males were found to be more affected by persistent ear discharge than females. Out of the 100 patients studied, 36% were females and 64% were males. Male: Female ratio is found to be 16:9. The age range of the patients was from a minimum of 18 years to a maximum of 60 years. With most commonly affected age group was between 18-30 years.

KOH was positive in 56(56%) study subjects and negative in 44(44%) study subjects.



TYPES OF PERFORATION IN KOH POSITIVE CASES



DISCUSSION

Chronic discharge from the middle ear and persistent otorrhea are typical in fungal CSOM. When antibacterial treatment fails to relieve symptoms, otologists should consider fungal elements as a probable cause.

Individuals with weakened immune systems (e.g., diabetes, chemotherapy, HIV infection) are more susceptible to middle ear fungal infections.

Studies have shown that a thorough search for fungi is desirable in all CSOM cases, especially when patients do not respond to antibiotic therapy. The second and third decades of life have the highest incidence of fungal CSOM, likely due to increased exposure to fungal spores in younger individuals.

In our study, age of the patients ranged from 18 years to 60 years. The study population consisted of 64 males (64%) and 36 females (36%). KOH positivity was observed in 56 patients (56%), while 44 patients (44%) were KOH negative. In the overall population, moderate-sized perforation was the most commonly observed, whereas small perforation was the least frequent. Both symptoms and ear discharge were found to be similar across the study population. When antibacterial treatment does not seem to relieve persistent otorrhea, otologists should suspect fungal elements as a probable cause. A study conducted at J. J. M Medical college, Davangere, Karnataka, Distribution of KOH positivity observed for 32.7% and KOH negative

for study population of 67.3%. The age ranged from 18 months to 87 years. Roy et al aimed to assess the accuracy of KOH mount in detecting fungal elements with COM, and comparing it with fungal culture. This study highlights the importance of using multiple diagnostic methods for fungal infections. Study conducted at Nalanda Medical college and hospital, Patna, Bihar. Distribution of KOH positivity observed for 16%. A study in the international journal of Otorhinolaryngology (2020) showed that among 100 patients with chronic otorrhea, fungal elements were detected in 35% by KOH mount and culture confirmed fungal growth in 40% showing good correlation. A 2018 study from south India, found that KOH mount had a sensitivity of 78% and specificity of 85% for diagnosing otomycosis. A Retrospective study to detect the KOH mount positive in ear discharge of COM. Out of 200 COM patients, 20.5% were KOH positive. Aspergillus species was the most common fungi detected.

CONCLUSION

The study highlights the significance of diagnosing fungal elements in cases of persistent ear discharge unresponsive to antibiotics. It underscores the utility of potassium hydroxide (KOH) mounts as a rapid, cost-effective diagnostic method for fungal identification. Early and accurate diagnosis facilitates timely antifungal therapy, and the adjunct use of antifungals with antibiotics may enhance clinical outcomes.

REFERENCES

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2. Fungal Flora in Chronic Suppurative Otitis Media: A Prospective Study: This study emphasizes the importance of considering fungal infections in CSOM, especially when patients do not respond to antibiotic therapy.
3. Incidence of KOH Positive Elements in Chronic Discharging Ear: This research highlights the significance of identifying fungal elements using KOH mounts in patients with chronic ear discharge unresponsive to antibacterial treatments.
4. Prevalence of Fungal Infection in Chronic Suppurative Otitis Media: This study discusses the prevalence of fungal infections in CSOM patients and underscores the need for thorough fungal investigations, particularly in cases unresponsive to antibiotics.
5. Significance of Fungal Flora in Chronic Suppurative Otitis Media: This article explores the role of fungi in CSOM and supports the necessity of considering fungal infections when standard antibacterial treatments fail.
6. Unresponsive Acute Otitis Media: Unresponsive acute otitis media is characterized by clinical signs and symptoms associated with otoscopic findings of inflammation that continue beyond 48 hours of therapy. This occurs in about 10% of children treated initially with a 10-day course of antibiotics [https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X\(2014\)2964953-3/fulltext](https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(2014)2964953-3/fulltext).
7. KOH Preparation Test: The KOH preparation test is a rapid method used to visualize fungal structures in clinical samples. It involves treating specimens with potassium hydroxide, which dissolves tissue material, leaving the alkali-resistant fungi intact. This technique aids in the rapid detection of fungal elements, facilitating timely and appropriate antifungal therapy. <https://studymicrobio.com/koh-preparation-test-introduction-principle-procedure-result-interpretation-advantages-disadvantages/>
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Foot Note

1. Ghosh et al studied fungal elements by KOH mount. Pseudomonas was found to be common bacteria among 100 samples and 50 samples were showing positive for KOH mount. They concluded that, patients with COM, send ear discharge for both culture and sensitivity and KOH mount and always give combines therapy.