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## Review on Otomycosis.

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### ABSTRACT

Otomycosis or fungal infection of the External Auditory canal and infrequently affecting the middle ear is a common condition encountered worldwide in ENT practice. It is more prevalent in hot, humid and dusty environment of tropics and subtropics. More predominant in males with a high incidence in the age group of 21-30 years and is mostly unilateral. The common presenting symptoms are itching discharge, fullness, hearing impairment, tinnitus and pain. The predisposing factors generally are frequent instrumentation and use of unsterile oil for cleaning spread of fungal infection from elsewhere in the body. Though diagnosis is mostly clinical, confirmation is by 10% KOH staining and SDA culture for fungus. Most common isolates are *Aspergillus* and *Candida* sp. Management is by preventing factors predisposing to otitis externa by patient education, and treatment is by frequent suctioning and use of 1% cotrimazole antifungal drops. Eradication of disease is difficult in presence of mastoid cavity. Complications are more in the immunocompromised.

**Keywords:** Otitis externa, Otomycosis, predisposing factors, 10% KOH staining, SDA (Sabourands dextrose agar) culture, *Aspergillus*, *Candida* sp, 1% cotrimazole drops, immunocompromised.

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## INTRODUCTION

Otomycosis is a fungal infection of the external auditory canal, middle ear and open mastoid cavity and frequently encountered by otolaryngologists and seen more in the immunocompromised patients. Otomycosis affects 10% of the population in the lifetime.[1] Approximately 5-25% of the total cases of otitis externa are due to otomycosis[2,3]. Is more prevalent in warm and humid climates, in lower socio-economic groups with poor hygienic condition, and in people wearing head covers, regular swimmers (swimmers ear) CSOM and diabetic patients. The fungal spores present in soil and sand containing decomposing vegetative matter get desiccated in the sun, blown away in the wind as small dust particles and are carried by water vapors (correlates to the high incidence during monsoon season with 80% humidity) [5]. Increase incidence is seen in males in the 2<sup>nd</sup> and 3<sup>rd</sup> decade as they are exposed to such environment more than females. [4]

The common presenting symptoms are itching, ear pain, discharge, fullness, blocking with decrease in hearing and tinnitus [5]. The common predisposing factors are trauma, eczema, presence of high humidity in extra-auditory canal (use of coconut & other hot oils), increased usage of antibiotic and steroid ear drops. Trauma to canal skin, leads to fungal colonization and sub epidermal invasion. Previous operated ears are more prone due to recurrent drainage, use of antibiotics, alteration in local environment and super infection by nosocomial bacteria and fungi. Alteration in the anatomy and change or increase in cerumen production favour fungal growth.[6]

## DISCUSSION

Otomycosis contributes to about 10% of all otitis externa [7]. It is either acute, sub acute or a chronic predominantly unilateral fungal infection of the external auditory canal (inner 1/3) characterized by inflammation, pruritis, scaling, superficial epithelial exfoliation with masses of fungal debris with hyphae and spores (like wet blotting paper) or as curdy grayish white discharge, sometimes associated with pain and suppuration [8].

### Classification of Otomycosis:

- **Primary Otomycosis**- Seen in an Immunocompetent person with intact tympanic membrane and absence of any other external or middle ear pathology. (with or without clinical signs of otitis externa).
- **Secondary Otomycosis**- Otomycosis in EAC or middle ear, alongside H/o and existing otitis media or external trauma or post operative ears or with H/o and /or existing fungal infection in other parts of the body (with or without immunocompromised status)[9]

Establishing diagnosis is by demonstration of fungal elements in 10% KOH mount and Sabouraud's dextrose agar (SDA) culture incubated both at 25<sup>o</sup>c and 37<sup>o</sup>c for 2-3 weeks of the scooped out material (debris or discharge). Gram's staining and bacterial culture is done simultaneously to exclude bacterial cause or co-infection.

Common fungal isolates from otomycosis cases are: *Aspergillus niger*, *A.flavus* and *fumigates*. *Candida* is second (especially when middle ear is involved) followed by *Penicillium*, *Mucor*, *Rhizopus* and *Pitirosporium*[10]. Other rare fungal isolates are *Trichosporon asahii*, *Scedosporium apiospermum*, *inflatum* and *Pseudallescheria boydii*. [11]. Among *Candida*, the common species causing otomycosis are *C.albicans*, *parapsilosis*, *tropicalis* and *gulliermondi*. Autoinoculation of fungus is seen in cases with dermatomycosis present elsewhere in the body [12]. Otitis Externa may follow dissemination of a systemic fungal infection such as coccidioidomycosis rarely [13].

**Management** includes both prevention and treatment. Prevention is by providing health education to patients regarding methods to avoid predisposing causative factors of otomycotic infection of ear.

**Treatment:** Patients diagnosed are subjected to repeated aural toileting by regular suctioning and removal of fungal debris, followed by instillation of topical 1% cotrimazole antifungal ear drops, 4-5 drops 3 times a day for 2-3 weeks. If co-existing bacterial infection occurs a combined antifungal antibiotic preparation is prescribed for the same period. Treatment failure is usually seen in immunocompromised patients. Parenteral

antifungals like Amphotericin B or Tolnaftate may be used along with gauze packs soaked in 1% azole solution applied topically and repeatedly changed.[13]

**Complications:** Malignant Otitis media externa occurs when there is deeper extension into adjacent tissue and bone with ulceration, necrosis, bleeding and severe pain. Though common with Psuedomonas deposition of oxalate crystals, Aspergillus sp are occasional causes of malignant OE. The other rare causes are Malasszia, pachydermatitis and Absidia corymbifera.[13]

Other complications include

- tympanic membrane perforation seen commonly behind the handle of malleus, due to mycotic thrombosis of tympanic membrane blood vessels leading to avascular necrosis and perforation.
- Hearing loss (due to involvement of the organ of corti) Fungi are present deeper in the middle ear in association with CSOM.
- Invasive temporal bone infection and erosion.
- Otomastoidiits (Aspergillus)
- Menigoencephalitis(Mucor)

Surgical treatment for large perforation is by Myringoplasty while small ones heal on their own. In severe infections of mastoid cavity, as in the immunocompromised patients aggressive treatment with oral and IV antifungals is needed. Mortality rate is high with this condition. Techniques in which absorbable gelatin sponge soaked in topical antifungal and antibiotic ear drops is used for treatment of recurrent and persistent otomycosis and in patients who cannot tolerate the ototropicals like those with chronic CSOM (intense pain due to middle ear irritation).[14].

### CONCLUSION

Delay in diagnosis and treatment of otomycosis prolong recovery. Once started on topical antifungals, there is good resolution in the immunocompetent. Eradication of disease is difficult in presence of mastoid cavity and metabolic diseases like diabetes mellitus. [15]Risk of recurrence is commonly seen in the immunocompromised, especially if factors responsible, remain uncorrected. Therefore, high clinical suspicion of otomycosis of external auditory canal can prevent unnecessary use of antibiotics & steroids for prolonged periods, leading to morbidity like hearing impairment. Further usage of terms, Primary and secondary is crucial to standardize reporting of otomycosis

### Abbreviation:

- OE-Otitis externa
- EAC-External Auditory Canal
- KOH-Potassium Hydroxide
- SDA-Sabourade Dextrose Agar
- CSOM-Chronic Suppurative Otitis Media.
- Sp-Species.

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