Otomycosis: A Comprehensive Review

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Abstract

When the external auditory canal is infected with an isolated fungal infection, it is called Otomycosis. It seems to be a very common clinical condition found in the outpatient department of otorhinolaryngology all over the world. The etiological microorganisms that form biofilm inside the earcanal are mostly Aspergillus and Candida species. Improper self-cleaning,self-medication, and insert of unnecessary tools into the ear canal can lead to the onset of otomycosis. The major symptoms of otomycosis are earache,ear discharge, and hearing loss. So the right diagnosis is a must to take a percussive step during the primary stage of infection. But when infection is spread up to a mastoid area with suppurative condition then it needs special medical attention especially in patients with low immunity. This comprehensive review has the aim to bringattention to self-hygiene and proper health education to maintain a healthy life.

Keywords: *Otomycosis,external auditory canal, Asparigellus, Candida species.*

Introduction

Otomycosis affect external ear canal; is simply known as an ear infectious disease which causes inflammation, more seen in dusty, warm and humid area.[1] The fungal species (Candida/Aspergillus) are commonly found causative microorganisms oragents. Black pepper like appearance seen with Aspergillus niger and Aspergillus fumigates and candida albicans gives white fluffy otorrhoea.[2] Habit of swimming (not drying ear after swimming), long term persistence and recurrence infection in-ear, without proper consultancy of doctor use of ear drops, use of steroid containing medicine & oil, excessive accumulation of ear wax, not keeping ear clean, etc can because of otomycosis.[3] In recent years,because of having a week immune system opportunistic fungal infections have gained greater importance in medicine. However, such fungi are very common to all categories of people and produce infectionmostly in immunocompetent hosts[4]. Special care should be taken to prevent invasive bone(temporal) infection and hearing loss. So treatment should be administered as soon aspossible especially inpatient with low immunity.[5] If otomycosis treatment is not taken properly then there is a chance of recurrence.[6] Along with this, increasing cases of antifungal resistance is one of the causes of recurrence.[7,8] so adequate treatment and follow up should be done to prevent the invasion of fungal infection.[9] This comprehensive review aims to create awareness about otomycosis and its management.

Method of Literature Search: Research articles regarding otomycosis were searched through a multiple systemic approach. First we conducted an online search of the Scopus, PubMed, and Medline database with otomycosis, fungal infections of external auditory

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canal, and antifungal treatment of otomycosis. The abstracts of the published articles were identified by this search method and other articles identified manually from citations. This manuscript reviews the details of otomycosis patients along with its important medical problems. This review article presents a baseline from where further prospective trials for otomycosis could be designed and helps as a spur for further research in this medical hazard.

Epidemiology: The complex structure of ear help in hearing as well as also maintain equilibrium. Ear problem cab of many types in different age groups of patients. One of the inflammatory condition; otitis externa (acute/chronic form) affect 4 in 100 people acute form and whereas 3-5% of the population suffer from chronic otitis externa.[10] In Saudi Arabia, one study showed around 49.3% of participated people had ear problems that 37% of elderly patients were having hearing impairment and 9.4%-2.9% of people showed otitis media.[11] A study done by Gorems et al showed,4 yrs age children had acute ear infection whereas 15-44 yrs age group patient showed chronic ear infection.[12] some of the studies[13,14,15,16,17] reported otomycosiswith high incidence in tropic countries.It has been seen that onset of otomycosis infection more in July- Aug months and young manage group patients showed more ear infection.[15,18,19] Some studies[13,14,17,20,21] done by pontes et al. (2009), Fasunla et al. (2008), Barati et al. (2011), Aneja et al. (2010) and Lia et al. (2012) reported female otomycosis in female although the prevalence of otomycosis is less in a female patient. Nazeer et al in 2015 reported high incidence of otomycosis at age range of 21-30 yrs group.[22]

Diagnostic Method: Otoscopy and biomicroscopy are the instruments help in the diagnosis of otomycosis. The otoscope has a light, a magnifying lens, and a funnel-shaped viewing piece, which use to examine the ear canal and eardrum. Biomicroscopy is a procedure of examination of tissues by microscopy. Some symptoms like severe itching, earache, ear discharge, and hearing loss reported by otomycosis patients.[23] In the case of otomycosis, with instillation of coconut oil into the external ear revealed high association (36.59% Nazeer et al[22] in 2015 reported a high association between otomycosis and use of coconut oil inside ear. Coconut oil capable of inhibiting spore germination[24,] therefore, help to keep conidia deposition in-ear and further facilitate the development of otomycosis. Another factor is the use of unsterile pins and sticks. This unhygienic way of cleaning ear leads to fungal infection development in the ear canal and it can also damage the skin which is protected from infection entry as a first defense.[22] Aspergillus fungal infection can be inspected by the presence of conidiophores in case of sporing aspergillus but when fungi at the hyphal stage then may not be picked up at the time of swabbing because hyphae gets embedded ear debris and wax. Thus right diagnosis is a must and lesion should not be overlooked and can prevent unnecessary exposure to antibiotics.[25]

Clinical Presentation: Ear blockage and pain could be the first symptom. This could be due to the accumulation of microbial colonization and blockage that leads to pain. Some other symptoms were also seen like discharge, itching,and otalgia.[26,27,28] Although, these symptoms are by no means specific to fungal infection. Yehia MM[29] et al 1990 suggested that the disease is not highly infectious. Initially mild discomfort pruritis with erythema seen then in moderate stage pain increase with oedematous erythema & seropurulent discharge. In severe condition may cause severe pain with hearing loss due to ear canal obstruction[10]

Etiopathogenesis: There is more chance of colonization of fungi at the outer surface of the ear as this surface having a humid area with suitable ph for microbes.[30] Clinical observation and microbiological testing must know the exact causative organism of infection.It was thought previously that only fungi are responsible for otomycosis but further studies showed an association of bacterial with this infection[23]. Pseudomonas aeruginosa and staphylococcus aureus association has been seen with otomycosis. Osguthorpe et al 2011reported the 10% of association of fungi with primary condition. it has been also observed through otoscopic examination that black fuzzy growth on cerumen may cause slight deafness due to obstruction of the external auditory canal.And among candida species candida albicans is seen to be more associated with otomycosis. Invasive otomycosis is more frequently caused by A. fumigatus than A. niger[1,31].

Treatment: Thus early diagnosis and the right treatment is must to prevent development of further complication. As bacterial infection also produce the same symptoms sometimes so microbial testing is a must before the start of treatment. Suction evacuation and proper cleaning is the first step of treatment and dryness of ear should be maintained.[31] Syringing of the canal should be avoided as it can cause perforation and

facilitate the progression of infection. Antifungal should be advice after antifungal sensitivity test. The topical therapy with antifungal or other antimicrobial agents is also necessary. Effective choices include clotrimazole cream, powder or solution (1%), amphotericin B (3%), flucytosine (10%), econazole cream (1%), thiomersal (Merthiolate) or Cresyl acetate solution. Salicylic acid, griseofulvin, and ketoconazole are less effective. Econazole (1%) solution is very effective in vivo in the treatment of otomycosis within 1-3 weeks (Bassiouny et al, 1986).[32]When topical antifungal not responding then systemic antifungal itraconazole for superficial infection and voriconazole for deeper infection should be prescribed.[33]

Conclusion

This study revealed that, most of the study of otomycosis found that predominant fungal species are Aspergillus and candida which showed great association with otomycosis. Treatment depend on microbial involvement and the general health of the patient. Empirical therapy of treatment should be avoided and should maintain proper self-hygiene to avoid complications.

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