International Journal of Medicine Research
ISSN: 2455-7404; Impact Factor: RJIF 5.42
Received: 17-04-2019; Accepted: 19-05-2019
www.medicinesjournal.com
Volume 4; Issue 3; July 2019; Page No. 51-54

Clinical view on treatment of otomycosis

Dr. Akram QM Al- Hashimi[1], Dr. Imad MY Al Kachache[2], Dr. Nabeel Ahmed Dawood[3]
[1, 2, 3] Nineveh Rehabilitation Center, Iraq

Abstract
Otomycosis is a common disease of ears with some difficulty in our practice because of the disease had some resistance to treatment and it has high recurrence in our humid region. To determine the fungal species in our sociality as well as to commonly used antifungal agents and research for the common reasons of antifungal resistance. We conducted an experimental descriptive study of 274 clinically diagnosed with fungal infection of the ear 1/7/2017-1/5/2019. Ear swab were collected for direct microscopic examination and fungal culture. 244 patients clinically diagnosed proved by direct slide and culture treated with antifungal Tolnaftate and Clotrimazole and obtained good results nearby in comparing other results with recurrence rate total 5.32%.We found a safe method in treating the difficult cases of otomycosis when the mass of fungi was adherent to skin with presence of inflammation of skin around it by applying of antifungal mixed with steroid for 2 days then washing done easily to extract the mass from the external ear then use antifungal.
Conclusion: According to the result of this study, systemic antifungal treatment not play a role in treatment of otomycosis. Using cream antifungal agents get quick resolution of symptoms but it has high recurrence rate. Otomycosis depend on many factors (risk factors) and it differ from region to region in the world depending on the climate.

Keywords: Otomycosis, Climate, Risk

Introduction
The term otomycosis is mainly used to describe the fungal infection of auricle, external ear canal, ear drum and rarely involve the middle ear. Species of fungus which affect the ear are mostly Aspergillus and Candida species which they are symptomatic and its main symptoms include, itching sensation, pain, aural fullness, aural discharge, hearing problem, tinnitus and rarely vertigo [1-3]. Clinical examination usually shows black mass, white, gray or cheesy like tissue with inflammation of external canal. Otomycosis is prevalent among middle age adult, while other age groups such as children and old age also affected. Children below 6 years of age affected with presence of underlying causes genetic, skin disease, bad hygiene, long use of antibiotic, chronic illness and hot humid climate [4-7]. The rate of recurrence of otomycosis in my study about 5% by using Clotrimazole, but by using of Tolnaftate about 7.5%. It is difficult to eradicate otomycosis in patient with diabetes, mastoidectomy cavity, immunocompromised patients (taking chemotherapy and radiation) and in perforated drum [8]. The common risk factors for otomycosis are poor hygienic condition, minor trauma, inflammation or physical injury, use of swimming pools, prolong use of antimicrobial or steroid ear drops in those with impaired immune system and being exposed to hot humid atmosphere as in tropical and subtropical regions [4, 9]. The recommended treatment for otomycosis involves local debridement by suction and mopping, dry of ear, local and systemic antifungal and discontinuation of local antimicrobial [10, 11]. Many antifungal agent were prescribed for otomycosis eradication, including Tolnaftate, Azole group, Amphoteracin B, Boric acid, Mercurochrome (1-2%) solution, phenyl mercuric acetate (0.02%) in sterile water, urea acetic acid solution ,or Aluminum acetate solution [12-15]. Our study focusing on the causative fungi for otomycosis in our region, as well as their susceptibility to common available antifungal agent and we tried to clarify the reason for newly emerged antifungal resistance.

Materials and Methods
Patient selection: An experimental descriptive study was performed on patient clinically diagnosed with otomycosis and by laboratory study (direct slide plus culture of fungi) patients who attended our otolaryngological out patient department of our center (Nineveh Rehabilitation Center) for about two years from 1/7/2017-1/5/2019. Those patients presented with different complaints including aural pain, itching, hearing impairment and otorrhea and on their examination revealed erythema, fungal mass or debris and creamy or blackish with aural discharge.

Specimen preparation and processing: After clinically diagnosis was established of 274 patients, sterile cotton swab was taken for direct slide examination for microscopical fungal study by using gram stain, 10% potassium hydroxide solution on glass slide, fungal culture was done on Sabouraud Dextrose Agar with incubated the dishes at 37º C for 48 hours [16].

Treatment
By dividing the patients into three groups

- First group(Candida albicans group) mild to moderate ear infection

The number of patients was 80 which were diagnosed as Candida albicans clinically and laboratorially by direct slide. The patients treated by suction of external canal and cleaning the canal by dry method and forty of them are treated with Clotrimazole solution and the others treated with Clotrimazole cream.

- Second group (Aspergillus niger) mild to moderate ear infection

The number of patients was 80 which were diagnosed as Aspergillus species diagnosed clinically and by direct slide method. The patients treated by suction of external canal and cleaning the canal by dry method and treated with Tolnaftate solution.

- **Third group severe infection**

This group we excluded any patient with history of tympanic perforation.

This group divided into two subgroups forty-two of them were diagnosed clinically and by direct slide method as Candida albicans which was present as a mass like filling the canal completely with inability to clean the canal with suction. This subgroup was treated with antifungal solution Clotrimazole mixed with steroid for 2 days and then washing the ear for extraction of the mass which was surrounded by sheath like cheesy material. After washing, complete cleaning of the ear and drying it then we used Clotrimazole with steroid for further 5 days then stop the steroid and continue the antifungal Clotrimazole for another 2 weeks. The other forty-two patients were diagnosed clinically and by direct slide method as Aspergillus niger which was present as mass like filling the canal completely with inability to clean the canal with suction this subgroup was treated with antifungal solution Tolnaftate with steroid for 2 days and then washing the ear for extraction of the mass which was surrounded by sheath like cheesy material. After washing, complete cleaning of the ear and drying it then we use antifungal Tolnaftate with steroid for further 5 days then stop the steroid and continue the Tolnaftate only for another 2 weeks.

Recurrence assay: The patient was evaluated after starting the treatment for three times later (five days after starting the treatment, second visit two weeks later, third visit after three months later). In our study we found the total recurrence rate was 5.32% from 244 patients. The recurrence was with group one (Candida albicans) 5%, group two (Aspergillus niger) 7.5%, group three (severe infection) 3.57%. The rate of recurrence of otomycosis in China was reported 8.98% but in Nigeria was reported 4.5% [8, 17].

Statistical analysis: Data were analyzed using SPSS software. and using STATA intercooled version 12.1. Quantitative data was expressed as mean, standard deviation, median and range.

Qualitative date was presented as numbers and percentages.

Results

The laboratory tests for 274 samples of ear cotton swabs were used for diagnosis and isolation fungus, each sample was divided into two parts for fungal analysis. One part was clarified with 10% potassium hydroxide solution on a glass slide for direct microscopic examination, and microscopy test using Gram stain. The second part of specimen was mounted on Sabouraud Dextrose Agar (SDA) plates, incubated at 37º C. Aspergillus spp. and Candida spp. were isolated. 20 cases of patients diagnosed with otomycosis treated for 5days with systemic antifungal (Fluconazole, Itraconazole) but there was no improvement locally in the ear (like subside the inflammation or reduction in the fungal mass) so systemic antifungal treatment was excluded from my study because of low response to treatment. 10 cases of patients with otomycosis (5 cases Candida albicans and 5 cases Aspergillus niger) was treated with 2% boric acid in 70% rectified alcohol, our patients cannot tolerate using of boric acid on their ears because of severe burning sensation and pain on applying the drug so boric acid application was excluded from my study, even it is very effective on otomycosis.[15] Our study was included 244 patients clinically diagnosed with otomycosis taken for about less than 2 years 1/7/2017-1/5/2019, 111 of them are females 133 are males. 176 patients were bilateral and 68 were unilateral otomycosis. The study including patient with age from 1 year to 76 years.

The place of residency of our patients was urban for most of them about 70% and the other 30% were coming from villages.

Table 1: Laboratory result of direct slide and culture

Patients	Organism in slide method	Organism in Culture method
132	Candida spp. 132	132
142	Aspergillus spp. 142	142

Table 2: The causes for visiting ENT center

Causes	On examination (First day)	First visit (5 days)	Second visit (2 weeks)	Third visit (3 months)
Swelling	178 (72.9%)	20 (8.19%)	4(1.6%)	1 (0.4%)
Pain	191 (78.28%)	22 (9%)	2(0.8%)	0 (0%)
Itching	193 (79.1%)	11 (4.5%)	4(1.6%)	2 (0.8%)
Hearing loss	223 (91.39%)	22 (9%)	5(2.04%)	3 (1.2%)
Secretions	200 (82%)	18 (7.4%)	3(1.2%)	0 (0%)

Table 3: Symptoms of patients with otomycosis on visiting the center.

Swelling and secretions				
	First day	**First visit**	**Second visit**	**Third visit**
Group 1	73	7	1	0
Group 2	77	12	2	1
Group 3	80	8	2	0
Hearing loss				
	First day	First visit	Second visit	Third visit
Group 1	68	5	1	0
Group 2	71	6	1	1
Group 3	84	11	3	2
Pain and itching				
	First day	First visit	Second visit	Third visit
Group 1	64	6	1	0
Group 2	67	9	2	1
Group 3	79	11	2	1

Table 4: Recurrence rate

	No. of patients in group	Recurrence percentage	No. of patients
Group 1	80	5%	4
Group 2	80	7.5%	6
Group 3	84	3.57%	3

The total recurrence rate was 5.32% from 244 patients' study. The frequency distribution of otomycosis recurrence in the different age group showed that there was no significant relationship between otomycosis and age group but the recurrence of disease was slightly higher in women than in men [9, 18]. The frequency of recurrence of

otomycosis with using of cream is more than other groups because of application of cream by cotton not reaching to deeper areas especially the inferior recess or near tympanic membrane and the patient causing scraping the wax mixed with dust entering to the deeper areas of the external canal and causing regrowth of otomycosis.

Discussion

The study of otomycosis is important for two reasons

- ENT specialists have difficulty in treatment of otomycosis and need skilled hand to clean and remove the mass of otomycosis to avoid injury of external canal and tympanic membrane.
- Patients are severely affected from such chronic illness.

The main aim of this study was to find the recurrence rate of otomycosis in patients treated with antifungal. In my study the results indicate that the recurrence rate in group 2 is the highest followed by group 1 and group 3, respectively. In this study the frequency of otomycosis was different between two genders, males are affected more than females but the recurrence was more in females than in males. The pathogenic fungi are abundant in the environment and employees are mostly affected and the fungi are transmitted to human ears through dust or contaminated equipment on ear manipulation [19]. 87% of patients reported in this study had ear manipulation and cleansing of the ear could be an important factor in exacerbation the infection. Aggravating factors are mopping, swimming, diabetes, immunocompromised patients and severe stresses. Hearing loss is the main factor for seeking medical advice followed by secretions, pain, swelling and itching respectively. It should be noted that a wide range of fungi are known as causative pathogens for otomycosis but the disease is mostly observed in tropical and subtropical regions of the world. It is expected that in each region special genus of fungi is the most cause of otomycosis due to climatic conditions and individual life style [9, 20, 21]. According to the results of present study each group has its advantages and disadvantages. For example, the group which is using cream they got rapid resolving of signs and symptoms but show high recurrence rate because of application of cream is not good and not reaching to all areas of external canal especially the area near tympanic membrane so this cause recurrence. Application of cream for 20 days twice daily causes dust and cerumen which present in the opening of the external canal may be pushed by cotton mopping to inside the canal and causes culturing of new growth. Otomycosis of the ear differs from patient to patient in signs and symptoms and from the amount of fungi (the fungal mass) however mild to moderate otomycosis by using antifungal solutions are easy to apply after cleaning the external canal so we obtained a good result. But the problem of our patients who have huge mass filling all the canal with the presence of swelling and inflammation of the skin around it which make it like cheesy sheath in which suction, probing and cleaning failed to remove the fungal mass without injury to the wall and tympanic membrane. If this injury occurs to the patient became worse and catastrophic to the patient. So, I gave them antifungal with steroid solutions for 2 days twice daily then patient came back for washing the external ear to extract the fungal mass and its sheath without difficulty to the patient. Then I put my patients in group 3 for another 5 days of antifungal and steroid then stopped the steroid and continue the using of antifungal for 2 weeks. So, I get the result of study in group 3 better than other groups and recurrence rate was very low.

Conclusion

This study revealed that Aspergillus species and Candida species were the most common fungal pathogens causing otomycosis. According to this result the otomycosis recurrence rate in Mosul is 5.32%. Washing in otomycosis is contraindicated but by using antifungal and steroid for 2 days we can do the wash without complication. Male affected with otomycosis more than females, and the recurrence is more in females. Prevention of otomycosis by avoiding the use of contaminated equipment and acquiring good health hygiene.

References

1. Munguia R, Daniel SJ. Ototopical antifungals and otomycosis: a review. Int J Pediatr Otorhinolaryngol. 2008; 72(04):453-459.
2. Pontes ZB, Silva AD, Lima EdeO, et al. Otomycosis: a retrospective study. Rev Bras Otorrinolaringol (Engl Ed). 2009; 75(03):367-370.
3. Kaur R, Mittal N, Kakkar M, Aggarwal AK, Mathur MD. Otomycosis: a clinicomycologic study. Ear Nose Throat J. 2000; 79(08):606-609.
4. Agarwal P, Devi LS. Otomycosis in a Rural Community Attending a Tertiary Care Hospital: Assessment of Risk Factors and Identification of Fungal and Bacterial Agents. J Clin Diagn Res. 2017; 11(06):DC14–DC18.
5. Abdelazeem M, Gamea A, Mubarak H, Elzawawy N. Epidemiology, causative agents, and risk factors affecting human otomycosis infections. Turk J Med Sci 2015; 45(04):820-826.
6. Ozcan KM, Ozcan M, Karaarslan A, Karaarslan F. Otomycosis in Turkey: predisposing factors, aetiology and therapy. J Laryngol Otol. 2003; 117(01):39-42.
7. YavoW, Kassi RR, Kiki-Barro PC, et al. [Prevalence and risk factors for otomycosis treated in the hospital setting in Abidjan (Ivory Coast)]. Med Trop (Mars). 2004; 64(01):39-42.
8. Jia X, Liang Q, Chi F, Cao W. Otomycosis in Shanghai: aetiology, clinical features and therapy. Mycoses. 2012; 55:404-9.
9. Kiakojuri K, Rajabnia R, Jalili B, Khafri S, Omran SM. Otomycosis in Adolescent Patients Referred to the Therapeutic Centers in Babol City, Iran. Jundishapur J Microbiol. 2015; 8:5.
10. Anwar K, Gohar MS. Otomycosis; clinical features, predisposing factors and treatment implications. Pakistan J Med Sci. 2014; 30:564.
11. Ho T, Vrabec JT, Yoo D, Coker NJ. Otomycosis: clinical features and treatment implications. Otolaryngol Head Neck Surg. 2006; 135:787-91.
12. Kaya AD, Kiraz N. In vitro susceptibilities of Aspergillus spp. causing otomycosis to amphotericin B, voriconazole and itraconazole. Mycoses. 2007; 50(06):447-450.
13. Szigeti G, Sedaghati E, Mahmoudabadi AZ, et al. Species assignment and antifungal susceptibilities of black aspergilli recovered from otomycosis cases in Iran. Mycoses. 2012; 55(04):333-338.
14. Ho HC, Hsiao SH, Lee CY, Tsai CC. Treatment of

refractory Aspergillus otomycosis with voriconazole: case series and review. J Laryngol Otol. 2014; 128(06):547-551.
15. Romsaithong S, Tomanakan K, Tangsawad W, Thanaviratananich S. Effectiveness of 3 per cent boric acid in 70 per cent alcohol versus 1 percent clotrimazole solution in otomycosis patients: a randomised, controlled trial. J Laryngol Otol. 2016; 130(09):811-815.
16. Meurman O, Koskensalo A, Rantakokko-Jalava K. Evaluation of Vitek 2 for identification of yeasts in the clinical laboratory. Clin Microbiol Infect. 2006; 12(06):591-593.
17. Fasunla J, Ibekwe T, Onakoya P. Otomycosis in western Nigeria. Mycoses. 2008; 51:67-70.
18. Nemati S, Hassanzadeh R, Jahromi SK, Abadi ADN. Otomycosis in the north of Iran: common pathogens and resistance to antifungal agents. Eur Arch OtoRhino Laryngol. 2014; 271:953-7.
19. Loh K, Tan K, Kumarasinghe G, Leong H, Yeoh K. Otitis externa--the clinical pattern in a tertiary institution in Singapore. Ann Acad Med, Singapore. 1998; 27:215-8.
20. Kiakojori K, Bagherpour Jamnani N, Khafri S, Mahdavi Omran S. Assessment of Response to Treatment in Patients with Otomycosis. Iran J Otorhinolaryngol. 2018; 30(96):41-47.
21. Ali K, Hamed MA, Hassan H, Esmail A, Sheneef A. Identification of Fungal Pathogens in Otomycosis and Their Drug Sensitivity: Our Experience. Int Arch Otorhinolaryngol. 2018; 22(4):400-403. doi:10.1055/s-0038-1626702