ORIGINAL ARTICLE

Various topical antifungal agents in otomycosis, which is the best?

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Abstract

Objectives: To assess the effectiveness of some topical non-specific antifungal agents compared to topical specific antifungal drugs in otomycosis therapy.

Method: The single-blind comparative prospective study was conducted from January 1, 2018, to January 1, 2019, at the outpatient department of Al Yarmouk Teaching Hospital, Baghdad, Iraq, and comprised patients presenting with signs and symptoms of otomycosis. The clinical diagnosis was made using otomicroscopy and was confirmed by ear swab results. They were classified into 3 equal groups, with group A receiving 1% clotrimazole ear drops, group B 3% salicylic acid drops, and group C 10% povidone iodine drops. Treatment in all the groups lasted three weeks. Data was analysed using SPSS 20.

Results: Of the 120 patients, 40(33.3%) were in each of the three groups. Overall, there were 62(51.6%) males and 58(48.4%) females with a mean age of 30.79±7.82 years. The left ear was affected in 70(58.33%) patients, and the right ear in 50(41.66%). The most commonly detected symptom was itching in 102(85%) patients.

The type of fungus detected was aspergillus niger in 67(55.84%) patients and candida albicans in 53(44.16%). The overall response to treatment was in 90(74.99%) patients; group A 39(97.5%), group B 29(72.5%), and group C 21(52.5%) (p=0.0001).

Conclusions: Local antifungal agents clotrimazole, 3% salicylic acid and 10% povidone iodine were effective in the treatment of otomycosis with varying degrees of success, with clotrimazole being the most effective.

Keywords: Otomycosis, Clotrimazole, Salicylic acid, Povidone iodine, Topical antifungals.

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Introduction

Otomycosis is one of the common problems that might be encountered in Ear-Nost-Throat (ENT) practice. It is a fungal infection of the external ear, with aspergillus (A.) niger and candida (C.) albicans were being the most frequent causative agents.[1] Globally, the disease is estimated to constitute about 5-25% of the total cases of otitis externa,[2] with frequency varying in different geographical zones, particularly in the tropics area.[3]

The treatment strategy includes the elimination of all the predisposing factors, meticulous suction cleaning of the debris and the application of the topical antifungal agents, such as specific antifungal drugs, like clotrimazole, miconazole, econazole, nystatin, tolnaflate and potassium sorbate, or non-specific anti-fungal agents, like acetic acid, boric acid, m-cresol acetate and gentian violet.[2]

Although various classes of anti-fungal drugs are used in the topical treatment of otomycosis, the disease still surprises otologists due to its chronicity and the recurrent nature.[4]

The current study was planned to assess the effectiveness of some topical non-specific antifungal drugs compared to topical specific antifungal drugs in otomycosis therapy.

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Patients and Methods

The single-blind comparative prospective study was conducted from January 1, 2018, to January 1, 2019, at the outpatient department of Al Yarmouk Teaching Hospital, Baghdad, Iraq. After approval from the institutional ethics review committee, the sample size was calculated using the Epi-Info equation adopted by the Centres of Disease Control and Prevention (CDC) taking into consideration the acceptable level of significance, power of study, expected effect size, underlying event rate in the population, and standard deviation in the population.[5]

The sample was raised using consecutive sampling technique and included patients of either gender clinically diagnosed as having fungal otitis externa (otomycosis). Those excluded were patients with bilateral otomycosis, malignant otitis externa, or other types of otitis externa apart from otomycosis, tympanic membrane perforation due to any cause, chronic otitis media or history of mastoid surgery, diabetes mellitus, immunocompromised, or those patients on radio or chemotherapeutic agents.

Informed consent from taken from all the subjects, while those who refused to participate or did not attend a

regular follow-up were also excluded.

All patients were subjected to detailed medical history and full ENT examination, with special concern on the affected ears, which included standard otoscopy and otomicroscopy (Carl_Zeiss type with 200mm lens) where the clinical diagnosis of otomycosis depending upon the presence of its signs and symptoms which was confirmed by ear swab results.

A meticulous suction clearance of the external ear canal was done, and then each patient was assigned a serial identification number before being divided into 3 equal treatment groups, with group A receiving 1% clotrimazole ear drop, group B 3% salicylic acid in 75% alcohol ear drop, and group C 10% povidone iodine ear drop.

The patients were asked to use the respective drops 3 time daily for 3 weeks, and to avoid water into the affected ear. The patients were followed up weekly for three weeks.

The response to the treatment was ascertained clinically by alleviation of the signs and symptoms of the disease, including the disappearance of fungal hyphae on microscopical examination and by the absence of fungal growth on smear.

Data was analysed using SPSS 20. Analysis of variance (ANOVA) was used to identify intra-group and inter-group correlation in terms of age, gender, microscopical findings and treatment response. P<0.05 was considered statistically significant.

Results

Of the 120 patients, 40(33.3%) were in each of the three groups. Overall, there were 62(51.6%) males and 58(48.4%) females with a mean age of 30.79±7.82 years (range: 16-68 years). The most common occupation was workers 46(38.3%), housewives 32(23.6%), employees 25(20.8%), retirees 9(7.4%) and students 8(6.6%). The left ear was affected in 70(58.33%) patients, and the right ear in 50(41.66%). The most commonly detected symptom was itching in 102(85%) patients (Table-1).

The type of fungus detected was A. niger in 67(55.84%) patients and C. albicans in 53(44.16%). The overall response to treatment was in 90(74.99%) patients; group A 39(97.5%), group B 29(72.5%), and group C 21(52.5%) (p=0.0001).

Among those with A. niger fungus, 17(25.3%) showed were resistant, and the corresponding number in those with C. albicans was 14(26.4%).

The response to the treatment was higher and earlier in group A, followed by group B and group C (Table-2). There was no significant correlation of any group with age and gender (p>0.05).

Table-2: The response to treatment.

Groups	1 week	2 weeks	3 weeks	Total
Group A	8 (20.51%)	19 (48.17%)	12 (30.76%)	39 (79.5%)
Group B	3 (10.34%)	8 (27.86%)	18 (82.06%)	29 (72.5%)
Group C	0 (0%)	2 (9.52%)	19 (0.48%)	21 (52.5%)

Discussion

Otomycosis is not an uncommon problem encountered in ENT practice as it often recurs and may require protracted treatment and prolonged follow-up.[4]

In the current study, the mean age was 30.79 years (range: 16-68 years), which was comparable with some earlier studies,[6-8] and not comparable with some others.[9,10] The differences in age probably depended upon the study location. However, there was no significant correlation of age in the different study groups with the treatment response, which is line with literature.[6,8] To explain the phenomenon, a larger sample size is required.

The current study showed males were more affected than females, which has been reported earlier as well,[6] but some studies have shown a female predominance.[9-11] The current study revealed no significant correlation of gender with response to treatment, so the differences in gender frequencies might be attributed probably to specific cultural characteristics and different lifestyles.

The most common occupation was workers in the current study, which has been reported earlier,[4] and the hot and

Table-1: Symptoms and signs among the study groups.

Clinical features	Itching	Ear blockage	Ear discharge	Hearing loss	Otalgia	Erythema of meatal skin	Oedema of meatal skin	Congestion of tympanic membrane
All groups	102 (85%)	98 (81.66%)	99 (82.5%)	78 (65%)	45 (37.5%)	53 (44.16%)	63 (52.5%)	51 (42.5%)
Group A	34 (85%)	33 (82.5%)	38 (95%)	25 (62.5%)	15 (37.5%)	16 (40%)	24 (60%)	18 (45%)
Group B	31 (77.5%)	36 (90%)	29 (72.5%)	27 (67.5%)	16 (40%)	19 (47.5%)	21 (52.5%)	16 (40%)
Group C	37 (36.27%)	29 (29.59%)	32 (32.32%)	26 (33.33%)	14 (35%)	18 (33.96%)	18 (45%)	17 (42.5%)

humid working conditions probably served as a good media for fungal growth. The left ear was the most common side affected. Since most of the population is right-handed, the use of the non-dominated left hand in self-ear cleaning might have resulted in epithelial damage to the external auditory canal, making it more prone to infection. The finding was comparable with some studies.[9]

As reported earlier,[6,9] the most common symptom in the current study was itching. Other studies have reported irritation[12] otalgia[7] as the most common symptoms. The types of fungi detected were A. nigrus (55.84%) and C. albicans (44.16%), which has been reported earlier as well,[11] but some studies reported different findings.[9,10]

The overall response to the treatment in the current study was 74.16%; 97.5% in group A and 52.5% in group C. Clotrimazole achieved a cure rate >95% in another study.[4] The correlation between treatment response with a specific fungal infection showed 75.75% cure rate with A. niger and 70.37% with C. albican infections, but with no significant difference, the findings only confirms the notion that in spite of many studies, there is no consensus agreement on the most effective treatment agent.[13]

One study[14] reported that salicylic acid had more antifungal efficacy than povidone iodine against A. niger, and this was confirmed by the current study, though there was a difference in the drug concentrations used in the two studies.

The current study revealed showed significant correlations between agent and response to treatment. Other studies also support this finding,[7,8,10] which concluded that clotrimazole was highly effective in otomycosis treatment, while in one study[6] 3% salicylic acid agent was found to be more effective than clotrimazole, while in another study[4] povidon iodine was supported in otomycosis treatment, as it is easily available, inexpensive, chemically stable, and not yet drug-resistant.

Clinical observations with the application of the appropriate local anti-fungal agent, together with meticulous mechanical debridement of the external auditory canal debris, usually result in effective resolution of the symptoms, although recurrence or even residual pathology is not uncommon.[15]

Conclusions

Clotrimazole, 3% salicylic acid and 10% povidone iodine were effective in the treatment of otomycosis with varying degrees of success, but clotrimazole was the most effective.

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Conflicts of Interest: None.

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References

1. Latha R, Sasikala R, Muruganandam N. Chronic otomycosis due to malassezia spp. J Glob Infect Dis 2010;2:189-90. doi: 10.4103/0974-777X.62875.
2. Khmmas AH, Dawood MR, Kareem A, Hammadi YA. Diagnostic accuracy of otitis media with effusion in children. Mustansiriya Medi J 2016;15:1-6.
3. Al-Shakarchi F. Use of clotrimazole eye suspension for fungal keratitis as monotherapy or sequentially with amphotercin-B. Mustansiriya Medi J 2015;14:6-13.
4. Munguia R, Daniel SJ. Ototopical antifungals and otomycosis: a review. Int J Pediatr Otorhinolaryngol 2008;72:453-9. doi: 10.1016/j.ijporl.2007.12.005.
5. Sullivan KM, Dean A, Soe MM. OpenEpi: a web-based epidemiologic and statistical calculator for public health. Public Health Rep 2009; 124: 471-4. doi: 10.1177/003335490912400320.
6. Malik AA, Malik SN, Aslam MA, Rasheed D. Comparative efficacy of topical clotrimazole and 3% salicylic acid in otomycosis. Rawal Med J 2012;13:46-9.
7. Khan F, Muhammad R, Khan MR, Rehman F, Iqbal J, Khan M, et al. Efficacy of topical clotrimazole in treatment of otomycosis. J Ayub Med Coll Abbottabad 2013;25:78-80.
8. Naqi SA, Bashir F, Khan AM, Mahmud T. Old is Gold. Topical Clotrimazole Remains an EffectiveTreatment of Otomycosis. Proc 2014;28:39-43.
9. Pontes ZB, Silva AD, Lima Ede O, Guerra Mde H, Oliveira NM, Carvalho Mde F, et al. Otomycosis: a retrospective study. Braz J Otorhinolaryngol 2009;75:367-70.
10. Hamza A, Khan Q, Khan M. Efficacy of Topical Clotrimazole in Otomycosis. Pac J Med Health Sci 2011;5:738-40.
11. Moghadam AY, Asadi MA, Dehghani R, Mahmoudabadi AZ, Raygan F, Hooshyar H, et al. Evaluating the effect of a mixture of alcohol and acetic acid for otomycosis therapy. Jundishapur J Microbiol 2010;3:66-70.
12. Hammond V. Disease of the External Ear. In: John N, Evans G, eds. Scott-brown's otolaryngology, 5th ed. London, UK: Butterworth-Heinemann, 1988; pp 167.
13. Stern JC, Shah MK, Lucente FE. In vitro effectiveness of 13 agents in otomycosis and review of the literature. Laryngoscope 1988;98:1173-7. doi: 10.1288/00005537-198811000-00005.
14. Abed AR, Hussein IM. Study the effects of different non-specific ototopical antifungal agents to treat Otomycosis. J Karbala Univ 2015;13:184-92.
15. Anwar K, Gohar MS. Otomycosis; clinical features, predisposing factors and treatment implications. Pak J Med Sci 2014;30:564-7. doi: 10.12669/pjms.303.4106.