Otomycosis with Perforated Tympanic Membrane: Self medication with Topical Antifungal Solution versus Medicated Ear Wick

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Abstract:

Objectives: In otomycosis with tympanic membrane perforation, many physicians prefer to insert an ear wick medicated with antimycotic cream. This needs multiple visits to the clinic and keeps the ear blocked for several days. Direct instillation of alcohol based antimycotic solution causes severe burning if it reaches the middle ear. In this work we compare patient's self medication with clotrimazole antimycotic solution used on Q-tips with physician–inserted ear wicks; in terms of safety, efficacy and patient satisfaction.

Study Design & Setting: Prospective controlled study in ambulatory setting.

Methodology: Forty consecutive patients with otomycosis with tympanic membrane perforation were included in the study. Diagnosis of otomycosis was both clinical and with mycological culture. Mean pure tone average (PTA) in the involved ear was measured after cleaning fungal debris. Patients were then, randomized into two groups; Q-tip group patients (n=20) were taught to self-medicate their ears two times daily with the clotrimazole solution on suitable Q-tips for three weeks. In ear wick group (n=20), a gauze wick impregnated with clotrimazole cream was inserted in the ear. Wick was changed every third day for two more visits (one week overall). Patients were followed up for 3 months.

Results: After three weeks all patients in Q-tip group and ear wick group had relief of their ear itching and complete disappearance of fungal growth in the deep meatus and on the tympanic membrane. PTA was 22±11dB in Q-tip group and 25 ±. 12 dB in ear wick group; the difference was not statistically significant (p= 0.11). Patients in ear wick group had sense of ear blocking and wetness during period of treatment. Transient burning sensation was reported by 2 patients in Q-tip group. During three months, there was recurrence of otomycosis in 5 patients from ear wick group and no recurrence in Q-tip group (*p*=0.04).

Conclusion: Self medication with clotrimazole solution on Q-tips and physician inserted medicated wicks are equally safe in treating otomycosis with perforated tympanic membrane. However, self medication with antimycotic solution on Q-tips gives more patient satisfaction and less rate of otomycosis recurrence.

Key Words: topical, clotrimazole, ear external, tympanic membrane perforation

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Introduction

Otomycosis is common in the ENT practice. It is the presenting problem in 6-9% of otologic patients. [1,2] There has been an increase in the prevalence of otomycosis in recent years due to the extensive use of antibiotic eardrops.[3] Diagnosis is mostly clinical. Candida albicans and Aspergillus of different species are the most commonly identified organisms [4, 5] and azole antifungal medications are effective in this context. [6, 7]

Treatment of otomycosis usually requires use of antifungal drops for at least three weeks to prevent recurrence. Treatment should be continued even after symptomatic relief. [8] Other important factors in management are: cleaning the ear, keeping it ventilated and treating associated otorrhea. Restoration of the unique milieu of deep part of external auditory meatus is a prerequisite for a lasting cure.

Eradication of otomycosisis more difficult in ears with perforated tympanic membrane.[9,10] Direct instillation of antifungal solution with a dropper is associated with stinging and burning sensation. Dermatologic antimycotic solutions are irritant to middle ear and may be ototoxic to the cochlea. Insertion of an ear wick saturated with antifungal solution or cream may be used to increase the contact time with meatal skin and to limit the seepage of the irritant solution to the middle ear. [11]

Use of Q-tips (ear buds) is discouraged by all ear specialists (including the authors). However, our experience is that they can be safe when used under the supervision of treating physician. In this work we compare patient's self medication with clotrimazole solution used on Q-tips with physician–inserted medicated ear wicks; in terms of safety, efficacy and patient satisfaction.

Patients & methods

This study was conducted in Qassim University and its affiliated hospitals in Qassim-KSA in the period from October 2009 to June 2010. A consecutive series of forty patients with otomycosis associated with perforated tympanic membrane were included in this study. Diagnosis was both clinical and with mycological culture. Patients with very narrow external canal, mastoid cavity, traumatic perforation, active middle ear infection orcholesteatoma were excluded. Patient with immune-compromised state e.g. uncontrolled diabetics were also excluded. Meticulous cleaning of the ear under the microscope was done followed by pure tone audiometry. Perforation is classified into: small (one quarter or less of TM) medium (half of TM orless) or large (more than half of TM). Threshold at 500 Hz, 1 kHz, and 2 kHz was used to calculate the pure tone average in the affected ear. Patients were then randomized into two groups:

Q-tip group patients (n=20) were taught to apply 1% clotrimazolesolution (Canesten®, Bayer -Germany) to the perforated ear using a Q-tip of suitable size; moderately soaked in clotrimazole solution. Ear canal was mopped by the physician in the office and patient recognized the depth of cotton bud insertion that should not be exceeded. Thereafter, patient leaned his head to the contra-lateral side for five minutes to give chance for the solution to seep on to the skin of the deep meatus. This is essential so that the solution reaches the anterior canal recess. If patient started to feel burning, he should immediately rectify his head. Patient was asked to repeat the procedure at home twice daily for three weeks. A visit was scheduled one week later to remove exfoliated keratin flakes or fungal debris if any.

Ear wick group patients (n=20) were treated with an ear wick impregnated with clotrimazole cream inserted by the physician in the clinic and changed every third day for three times (over one week)

Symptom improvement, otomicroscopic findings, patient's satisfaction, and pure tone average were recorded at the end of three week period. Otomicroscopy was repeated after three month to detect recurrence. Chi square test was used to compare the categorical variables. T-test was used to compare pre- and post-treatment hearing threshold. Statistical significance was set at 5%. We used EXCEL Microsoft® software for statistical analysis.

Results

Two patients from Q-tip group and three patients from ear wick group were lost in the follow up. Statistics here are for patients who came for follow-up after three months. No statistically difference in the age, size of perforation, mycological culture result and pure one average between the two groups (Table 1).

In Q-tip group, patients tolerated the treatment very well and were very satisfied with this method of treatment. Two patients (11%) had some burning in the first two days of treatment. Itching was gradually relieved over the first week in all patients. Four patients (22%) needed suction of some fungal colonies in the second visit. By the end of treatment period and in all patients, skin of external canal and tympanic membrane looked normal. The mean pure tone average was 22± 11dB.

In ear wick group; patients had relief of itching but they had sensation of ear blocking and wetness while the wick was in the ear. After three weeks and in all patients, skin of external canal looked normal and tympanic membrane was clean of debris. The mean pure tone average was 25 ±. 12 dB

There was no statistically significant difference between the two groups in post treatment pure tone average (p=.11). During the 3 month follow up period, five patients in ear wick group had evidence of recurrence of otomycosis and no recurrence in Q-tip group. This is statistically significant (p= 0.04). By the end of three months, three patients (16.5%) in Q-tip group and one patient (5%) in ear wick group had closure of their tympanic membrane perforation.

Table 1

	Q-tip group	ear wick group	*P* value
No of patients	18	17	
Age (Y)			>.05
Range	23-77	25-69	
Mean	40±14	38±14	
Male: Female ratio	12:6	11:6	
Mean PTA	27±13	28±10	>.05
Hx. of myringoplasty	2	1	
Size of TM perforation			
Small	11	10	>.05
Medium	5	6	>.05
Subtotal	2	1	>.05
Culture result (%)			
Aspergillus	56	58	>.05
Candida	44	42	
Treatment period (weeks)	3	1	
Duration of follow-up (months)	3	3	
Post-treatment PTA (dB)	22± 11	25 ±12	>.05
Perforation closure	3	1	
Recurrence after 3 months	0	5	.04*

PTA: pure tone audiometry *statistically significant

Discussion

Jia et al reported recurrence of otomycosis in 8.89% of treated subjects. [12] In case of tympanic membrane perforation, treatment is difficult and it needs patient and physician cooperation. To decrease chance of recurrence and to improve patient well being during a three- week treatment period, we tried a self medication method with clotrimazole on a Q-tip.

Although few investigators [5] recommend systemic antifungal medications for otomycosis, topical treatment is the norm in ENT practice. In patient with tympanic membrane perforation, judicial use of skin antimycotic preparations is necessary to assure safety and efficacy. [13, 14] Clotrimazole is practically insoluble in water. Solvents used in dermatologic solution are propylene glycol, isopropyl alcohol and polyethylene glycol. Although they have a good drying effect, they are irritant to middle ear mucosa and cause burning or stinging sensation.

We are aware of all drawbacks of Q tips in the ear. They are too large for most ears and push the wax and debris into the deep meatus. [15] We do not recommend their use except when there is definite advantage. Using them in our study to apply clotrimazole solution in presence of TM perforation gives no or minimal irritation to the external ear or middle ear and treatment can be safely continued for three weeks. Patients neednot to come to the clinic frequently. The ear is ventilated and in the same time irritation of middle ear is avoided. This ensures clinical as well as mycological cure with minimal chance for recurrence.

Other investigators had the same difficulty in treating otomycosis with perforated eardrum. Lumassegger et al., reported treatment of a female patient suffering from intractable otitis externa with tympanic membrane perforation usinga mixture of 1% N-chlorotaurine and 0.1% dexamethasone.[16] Latha and his colleagues used clotrimazole powder in one patient with otomycosis caused by malassethsia spp. [17] Powder does not cause irritation but it needs repeated application in the clinic.

Use of a medicated ear wick has also been reported.In the study done by Hurst, [11] a gauze wick saturated with hydrocortisone, clotrimazole, framycetin and gramicidin is inserted. We found this method equally safe and effective but patients felt the ear blocked and wet. Treatment course is typically short and patient has to come to the clinic twice weekly. Disease recurrence after stopping treatment is not uncommon. Moreover, steroid containing cream delays mycological cure as has been shown in other dermatomycosis. [18] Small perforations tend to close when the ear becomes free of otomycosis.[11] This happened in four patients in our study. Restoration of the unique milieu of deep part of external auditory meatus seems to be a prerequisite for this closure.[11]

We compared pre and post-treatment pure tone average to examine the safety of treatment. We do not expect hearing improvement after treatment. Nonetheless, there is some improvement of hearing and relief of earfullness particularly in patient with small perforation.

Conclusion

We conclude that self medication with clotrimazole solution on Q-tips and physician inserted medicated wicks are equally safe in treating otomycosis with perforated tympanic membrane. However, self medication with Q-tips does not give sense of blocking to the patients, and does not irritate the middle ear. It also gives more sustained mycological cure.

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