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COMPARATIVE STUDY: EFFICACY OF CLOTRIMAZOLE AND 3% SALICYLIC ACID IN TREATMENT OF OTOMYCOSIS IN EASTERN NEPAL

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ABSTRACT
Otomycosis is a fungal infection of the external auditory canal (EAC) and it is mostly prevalent in hot and humid areas of the tropics and subtropics. Most common organism causing otomycosis are aspergillus niger (80% of case), candida albicans (second most common), actinomyces, trichophyton, aspergillus fumigatus and candida tropicalis. The aim of this study was to compare the efficacy of clotrimazole and 3% salicylic acid in the treatment of otomycosis. This is a comparative study conducted among a 100 number of patients in Otorhinolaryngology Out Patient Department Purbanchal University College Of Medical and Allied Sciences, Gothgaun, Nepal. They were divided in two groups A and B with 50 patients in each. Group A was treated with clotrimazole and B with 3% Salicylic acid in affected ears three times a day for 2 weeks in the form of local drops. The outcome of both groups was compared by evaluating itching, blockade, otoscopic findings of fungal debris and ear discharge after two weeks of treatment. Male to female ratio was 1.86 in both the groups. Adults were 65.0% of all patients. Males experienced the more severe symptoms as compared to the females in both pre and post treatment phases ($p > 0.050$). 3% Salicylic Acid better controlled itching and ear blockade ($p=0.000$) as compared to clotrimazole. We came to a conclusion that Topical 3% Salicylic acid was better remedy in terms of getting rid of symptoms of otomycosis.

KEYWORDS: Clotrimazole, Otomycosis, Salicylic Acid.

INTRODUCTION
Otomycosis is a well known fungal infection of the external auditory canal (EAC) and it is mostly prevalent in hot and humid areas of the tropics and subtropics(as in our eastern Nepal region). Being a curable disease it is yet a burden for both the patient and the otorhinolaryngologist despite its various treatment measures in the different part of globe. In spite of implementation of long term treatment and follow-up it demonstrates a high recurrence rate.[1] Most common organism causing otomycosis are aspergillus niger (80% of case), candida albicans (second most common), actinomyces, trichophyton, aspergillus fumigatus and candida tropicalis.[2] Other factors have been reported predisposing otomycosis which includes broad spectrum antibiotic therapy, steroids and cytostatic medication, neoplasia , immune disorders, bacterial infections, use of hearing aid or a hearing prosthesis, self inflicted trauma and swimming in contaminated pools.[3]

The recurrence rate and complications are higher in otomycosis patients requiring longer duration of treatment. The infection is usually unilateral and characterized by inflammation, pruritus, scaling and severe discomfort such as pain and suppuration. Immunocompromised patients are at a higher risk.[4]

Being difficult to treat, the main stay of treatment has been aural toilet, use of appropriate antifungal and improvement of general health and hygiene. Few studies have suggested topical use of pimecrolimus to be more efficacious than aural toilet in chronic cases.[5] Clotrimazole as solution or cream is the most popular and effective, but recurrence is common.[6,7] 3% salicylic acid (SA) in rectified spirit is another alternate with both antifungal and keratolytic properties-used as eardrops . Other Imidazole group (ketoconazole), cresylate and aluminum acetate eardrops are other alternatives and are used for 6 weeks depending upon severity of the disease.[8] These agents result in more than 80% resolution on initial application with fewer chances of recurrence. Ciclopiroxolamine, Gentian violet, Merthiolate, Mercurochrome and Copper acetate are known antifungal and antiseptic compounds and they

have been used in different studies to demonstrate their clinical use in otomycosis.[9] In this study, our intension is to determine whether an agent with both antifungal and keratolytic or an agent only with antifungal properties is effective in the management of otomycosis.

MATERIALS and METHOD

Study design and area

An outpatient department based, comparative double blind study was carried out from march 2019 to august 2019 at Department of Otolaryngology of Department of Otorhinolaryngology, Purbanchal University College Of Medical and Allied Sciences, Gothgaun, Eastern Nepal. This region shares boundaries with india on east and southern part in a close distance.

Study Population

Total of 100 patients were selected through non-probability convenience sampling technique. Recording of their demographic profile, medical history, clinical features and treatment modalities were done.

Inclusion Criteria

Patients who were willing to participate in this study were divided in four age groups i.e. children (≤ 9 years), adolescents (10-19 years), adults (20-60 years) and olds (> 60 years). An informed consent was taken regarding inclusion in the study and medicine given. Benefits and risks involved in the treatment were explained to them.

Exclusion Criteria

Exclusion of patients with CSOM, any other ear pathology, immune incompetence, diabetes mellitus, using steroids or chemotherapeutic agents or being irradiated were done.

Sample Collection and Analysis

All patients were divided into two treatment groups. Odd numbers patients were included in group A, who received clotrimazole three drops in affected ear three times a day for 2 weeks. Patients with even numbers were on group B and received 3.0% SA three drops in affected ear three times a day for 2 weeks. Data was collected at the start of treatment and 2 weeks after medication. Medication history review, ear symptoms and ear examination with otoscope was done on each visit. Ear itching was graded as 1 (absent), 2 (mild), 3 (moderate) and 4 (severe). Ear blockade was graded as present or absent and fungal discharge/debris as present or absent. The efficacy of the drugs was analyzed by their effect on itching, ear blockade and absence of fungal debris in EAC. Data was analyzed using SPSS v 18. Chi-square statistics were used to seek any correlation of ear itching, blockade and fungal discharge/debris. Paired t-test was used to compare the pre and post treatment profile of the patients. ANOVA was used to compare the two treatments. P value of <0.05 was taken as significant.

RESULT

Out of 100 total patients male to female ratio was 1.86 in both the groups. Adults outnumbered all the other age groups as they were 65.0%. Demographic characteristics of study population are shown in Table 1. Adult males experienced more severe itching (22.0%) before treatment and at the end of two weeks treatment adults benefited more than the other age groups (52.0%) and it was significant (p=0.030) (Table 2). Almost similar results were seen in ear blockade and fungal debris.

Table 1: Demographic characteristics of study population (n=100).

		Treatment groups					
		Clotrimazole		3% Salicylic acid		Total	
		Number	%	Number	%	Number	%
Age groups	Children	3	42.9	4	57.1	7	100
	Adolescent	8	61.5	5	38.5	13	100
	Adults	32	49.2	33	50.8	65	100
	Olds	7	46.7	8	53.3	15	100
	Total	50	50.0	50	50.0	100	100
Gender of the patient	Female	18	51.4	17	48.6	35	100
	Male	32	49.2	33	50.8	65	100
	Total	50	50.0	50	50.0	100	100

Table 2. Changes in various parameters after treatment.

			Treatment groups						P value
			Clotrimazole		3% Salicylic acid		Total		
			Number	%	Number	%	Number	%	
Ear Itching	Pretreatment	Absent	-	-	-	-	-	-	0.218
		Mild	19	63.3	11	36.7	30	100	
		Moderate	15	44.1	19	55.9	34	100	
		Severe	16	44.4	20	55.6	36	100	0.711
		Total	50	50.0	50	50.0	100	100	
	Post Treatment	Absent	37	48.1	40	51.9	77	100	
		Mild	8	53.3	7	46.7	15	100	
		Moderate	5	62.5	3	37.5	8	100	
		Severe	-	-	-	-	-	-	0.079
		Total	50	50.0	50	50.0	100	100	
Ear Blockade	Pretreatment	Yes	47	48.5	50	51.5	97	100	
		No	3	100	-	-	3	100	
		Total	50	50.0	50	50.0	100	100	0.000
	Post Treatment	Yes	21	91.3	2	8.7	23	100	
		No	29	37.7	48	62.3	77	100	
		Total	50	50.0	50	50.0	100	100	0.383
		Present	37	52.9	33	47.1	70	100	
Fungal debris/ Discharge	Pretreatment	Absent	13	43.3	17	56.7	30	100	
		Total	50	50.0	50	50.0	100	100	0.298
	Post treatment	Present	11	61.1	7	38.9	18	100	
		Absent	39	47.6	43	52.4	82	100	
		Total	50	50.0	50	50.0	100	100	

There was significant difference noted as may be seen in table 2. Both the treatments had positive effect on the improvement of symptoms.

Table 3. Composite differences in results.

Patients treated With	Symptom	No	Mean change	95% Confidence Interval for Mean
Clotrimazole	Ear Itching after treatment	50	1.36 + 0.663 -	1.17 - 1.55
	Ear blockade after treatment	50	1.58+ 0.499 -	1.44 - 1.72
	Fungal debris/discharge after Treatment	50	1.78+ 0.418 -	1.66 - 1.90
3% salicylic Acid	Ear Itching after treatment	50	1.26+ 0.565 -	1.10 - 1.42
	Ear blockade after treatment	50	1.96+ 0.198 -	1.90 - 2.02
	Fungal debris/discharge after Treatment	50	1.86+ 0.351	1.76 - 1.96
Total	Ear Itching after treatment	100	1.31+ 0.615	1.19 - 1.43
	Ear blockade after treatment	100	1.77+ 0.423	1.69 - 1.85
	Fungal debris/discharge after Treatment	100	1.82+ 0.386	1.74 - 1.90

On the comparison of two treatment modalities, it was found that salicylic acid had better performance than the clotrimazole in various variables (Table 3).

DISCUSSION

Out of 61 fungal species the most common in tropics are Candida and Aspergillus causing otitis externa.[10] Self-manipulation is the reason of Implantation and subsequent infection by fungi.[11] Frequent aural toilets is the main stay in prevention and treatment of fungal otitis externa. Removal of debris is done by suction clearance and EAC is kept dry. Some agents like 3% SA in rectified spirit are effective because of their action on host tissues, their intrinsic fungistatic, keratolytic, acidifying and drying properties. Alternatively, other antifungal agents like clotrimazole/Tolnaftate/Fluconazole preparation can also be given, but these should not be combined with steroids. The local antifungal drops should be continued for 7-10 days after apparent cure. Some studies have shown that

certain fungal species like Candida albicans are more susceptible to 3% SA.[12] This finding is based on meta-analysis of various studies from tropical areas on the globe. There are studies which do not agree with our results.[13] The results of this study cannot be validated as it only had fifteen cases and has studied more than five treatment protocols. Azole group has shown to be quite effective in treating otomycosis.[14] Antifungals like 3% SA and 3% acetic acid solutions have dual effect, firstly causing separation of fungi from external auditory canal to which they are anchored and secondly they cause disturbance of acid base balance within the fungal cells thereby causing cell death and inhibition of fungal proliferation as opposed to inhibition of fungal proliferation only by antifungals like clotrimazole.[15]

In our study, 3% SA improved ear itching better than clotrimazole. It also decreased the ear blockade better than clotrimazole. As far as the clearance of fungal debris/discharge is concerned, Clotrimazole had better result.

CONCLUSION

3% salicylic acid was a superior agent in control of otomycosis as compared to clotrimazole with special reference to ear itching and blockade. Proper aural toilet followed by local administration of 3% SA is better regiment for the treatment of otomycosis in our settings in Eastern Nepal.

REFERENCES

1. Ho T, Vrabec JT, Yoo D, Coker NJ. Otomycosis: clinical features and treatment implications. Otolaryngol Head Neck Surg, 2006; 135: 787-91.
2. Pakshir K, Sabayan B, Javan H, Karamifar K. Mycoflora of human external auditory canal in Shiraz. Iranian Red Crescent Med J., 2008; 10: 27-9.
3. Moghadam YA, Asadi AM, Dehghani R, Mahmoudabadi ZA, Rayegan F, Hooshyar H. Evaluating the effect of a mixture of alcohol and acetic acid for otomycosis. Jundishapur J Microbiol, 2010; 3: 66-70
4. Viswanatha B, Naseeruddin K. Fungal infections of the ear in immunocompromised host. Medit J Hemat Infect Dis., 2011; 3: 10-13.
5. Djalilian HR, Memar O. Topical Pimecrolimus 1% for the Treatment of Pruritic External Auditory Canals. Laryngoscope, 2007; 117: 1319.
6. Jackman A, Ward R, April M, Bent J. Topical antibiotic induced otomycosis, Int J Pediatr Otorhinolaryngol, 2005; 69: 857-60.
7. Mishra GS, Mehta N, Pal M. Chronic Bilateral Otomycosis Caused by Aspergillus Niger. Mycoses, 2004; 47: 82-4.
8. Fasunla J, Ibekwe T, Onakoya P. Otomycosis in Western Nigeria. Mycoses, 2008; 51: 67-70.
9. Palacio AD, Cuétara MS, Suso MJL. Randomized Prospective Comparative Study: Short-Term Treatment With Ciclopiroxolamine (Cream And Solution) Versus Boric Acid in The Treatment Of Otomycosis. Mycoses, 2002; 45: 317-28.
10. Ong YK, Chee G. Infections of the External Ear. Ann Acad Med Singapore, 2005; 34: 330-4.
11. Than KM, Naing KS, Min M. Otomycosis in Burma, and its Treatment. Am J Trop Med Hyg, 1980; 29: 620-3.
12. Ismail HK. Otomycosis. J Laryngol Otol, 1962; 76: 713-9.
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.
14. Youssef YA, Abdou MH. Studies on Fungus Infection of the External Ear. II. on the Chemotherapy of Otomycosis. J Laryngol Otol, 1967; 81: 1005-12.
15. Munguia R, Daniel SJ. Ototopical Antifungals and Otomycosis: A Review. Int J Pediatr Otorhinolaryngol, 2008; 72: 453-9.