

Effect of Honey in the Management of Otomycosis

Research Article

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Abstract

Otomycosis is a fungal infection of External ear, characterized by earache, pruritus, ear blockage, discharge, hearing loss and ringing in ear. It is the most common clinical entity in the ENT clinics. The disease is more common in hot and humid climate. Its worldwide prevalence is 5.2 % and 9 % in India. 5-25 % of otitis externa cases are due to otomycosis. Bactericidal and fungicidal activity of Honey is proved previously by in vitro study. Honey has high osmolarity and acidic pH. And fungus does not grow in acidic media. With this background, present study is aimed to know the efficacy of the Honey in the management of Otomycosis. This randomized clinical control trial including two groups, one is intervention group (group A) and second is control group (group B). Pt is advised to instill three drops of Honey thrice a day for 7 days in Group A and three drops of Clotrimazole thrice a day for 7 days in Group B. There is statistically highly significant results was observed in all signs and symptoms except hearing loss which is significant in both Groups. Statistically insignificant difference was found between both Groups.

Keywords: Otomycosis, Honey, Fungal infection.

Introduction:

Otomycosis is the fungal infection of the external ear. It is characterized by pain, itching, discharge, ear blockage, hearing loss and ringing in ear. Water entry in ear, scratching of the ear etc. produce favorable atmosphere for fungus. Fungus lodges in that area and starts growing and produces these symptoms. Sign of the Otomycosis is whitish, blackish, brownish fungus in ear. Sometimes wet blotting paper appearance also seen. Tragus tenderness and erythema are also the sign of Otomycosis. Otomycosis is commonly seen in hot and humid climate. (1) According to American Academy of Otolaryngology, prevalence of Otomycosis is 5.2 % all over world and 9.00 % in India. 5-25 % of otitis externa cases are due to Otomycosis. 90 % of fungal infections involve *Aspergillus* species and the rest *Candida* species. (2)

Treatment of Otomycosis consists of ear toilet, antifungal and antibacterial therapy topical as well as internal. (3) It is the adequate treatment for the management of Otomycosis. But there are many side effects of this treatment including hypersensitivity, gastric disturbance like nausea, vomiting, diarrhea, etc. So, there is need to find out better alternative which is cheap and effective.

Honey is the natural food product. It contains number of amino acids, so it has acidic pH. (4) it lyses the fungus and bacteria as it has high osmolarity. Its antifungal, antibacterial action is proved by previous in vitro study. With this background present study is planned to know the effect of Honey in the management of Otomycosis.

Some previous research work were done on the disease Otomycosis. There are three works were carried out in department of *Shalakyatantra* IPGT and RA, GAU, Jamnagar. First one was conducted by Dr Anant Javale et al in 2005. There were two groups in this study - Group I patients were treated with *Arka Taila* and Group II patients were treated with *Sarshapa Taila*. Scholar concluded that both the drug have almost similar effect in the treatment of Otomycosis. Second study was conducted by Dr Anupama Patra et al in 2007 and third one by Dr Komal Palmer in 2010. There were two Groups in both the study. Group I patients were treated with *Arka Taila* and Group 2 patients were treated with Clotrimazole ear drops. Both the study shows that Group I i.e. *Arka Taila Karnapoorana* and Group II i.e. Clotrimazole ear drops have similar effect in the management of Otomycosis.

Aims and Objectives:

To evaluate the role of *Madhu* (Honey) in the management of Otomycosis (*Karnashoola*).

Materials and Methods:

In this randomized clinical control trial, 32 patients were registered from O.P.D. of *Shalakyatantra*

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Tantra, IPGT & RA, GAU, Jamnagar. The study was started after approval from the Institutional Ethics Committee (No. PGT/7-A/Ethics/2014-15/1538, dated: 02-09-2014) and registered in CTRI (CTRI/2016/05/006935, dated: 13/05/2016). A consent letter based on subject's willingness and interest to participate in the study was obtained.

Inclusion Criteria:

- Patients fulfilling the diagnostic criteria which are based on signs and symptoms of Otomycosis.
- Patients were selected of age group between eleven to seventy years old.

Exclusion Criteria:

- Patients aged below eleven years and above seventy years were excluded.
- Patients having perforated tympanic membrane.
- Patients suffering from any chronic debilitating disease like Ca, Koch's, HIV etc were excluded from study.

Investigations

- Routine hematological, Random Blood Sugar and routine urine examination before treatment were carried out to rule out any systemic disorder.
- Smear examination by 10 % KOH preparation of ear discharge.
- Fungal Culture of ear discharge.

Sampling Method:

Lottery simple random sampling method was adopted.

Grouping and Posology:

Patients were randomly divided into two groups.

Group A: Number of patients 16

Patient was advised to instill three drops of Honey for 7 days after dry mopping of External Auditory Canal.

Group B: Number of patients 16

Patient was advised to instill three drops of Clotrimazole ear drop for 7 days after dry mopping of External Auditory Canal.

Follow Up:

After completion of the treatment, follow-up was carried out for 1 month at the interval of 15 days.

Criteria for the Assessment:

The efficacy of the therapy was assessed on the basis of improvement in subjective and objective criteria. Scoring was done as following.

Table No. 1- Subjective and Objective Criteria

Subjective Criteria	Objective criteria
Otalgia (<i>Karnashoola</i>)	Fungal mass
Itching (<i>Karnakandoo</i>)	Erythema
Ear discharge (<i>Karnasrava</i>)	Tenderness
Ear blockage (<i>Karnapratinaha</i>)	
Hearing loss (<i>Badhira</i>)	
Tinnitus (<i>Karnanada</i>)	

Scoring pattern:

Table No. 2 : Scoring pattern of Otalgia (*Karnashoola*):

Grade	
0	No pain
1	Patient is not at all restless / pain is tolerable
2	Makes Patient through restless can be controlled
3	Pain disturbs patient's routine work

Table No. 3 : Scoring pattern of Itching (*Karnakandoo*):

Grade	
0	No itching
1	Occasionally
2	Mild (2-3 times/day)
3	Moderate(>3 times and <10 times)
4	Severe (continuous whole day)

Table No. 4 : Scoring pattern of Ear discharge (*Karnasrava*):

Grade	
0	No discharge
1	Scanty - if tip of swab stick is stained by the discharge
2	Moderate - if discharge remains in the EAC
3	Profuse - if discharge comes out of EAC and stained pillow during sleep

Table No. 5 : Scoring pattern of Aural blockage (*Karnapratinaha*):

Grade	
0	No feeling of ear blockage
1	Occasionally feeling of ear blockage
2	Day/night time feeling of ear blockage
3	Whole day feeling of ear blockage

Table No. 6 : Scoring pattern of Hearing loss (Badhira):

Grade	
0	No hearing loss
1	Mild - Not hearing whisper sound (30 dB)
2	Moderate - Not hearing conversation sound (60 dB)
3	Severe - Not hearing shouting sound (90 dB)

Table No. 7- Scoring pattern of Tinnitus (Karnanada):

Grade	
0	No abnormal sound is hearing
1	Occasionally abnormal sound is hearing
2	Day/night time abnormal sound is hearing
3	Whole day abnormal sound is hearing

Table No. 8- Scoring pattern of Fungal mass:

Grade	
0	No fungal mass present
1	Half packed EAC with fungal mass
2	Full packed EAC with fungal mass

Table No. 9- Scoring pattern of Erythema:

Grade	
0	No erythema
1	Mild
2	Moderate
3	Severe

Table No. 10- Scoring pattern of Tenderness:

Grade	
0	No tenderness
1	Mild - patient tolerate when touched
2	Moderate - patient shows facial expression when touched
3	Severe - patient will not allow to touch

Analysis of data and presentation of result:

The values of data were expressed as a percentage of relief and mean and standard error of the mean. The data were analyzed by Student's 't' test for comparing before and after treatment obtained scores. The level of significance are expressed as $P > 0.05$ as insignificant, $P < 0.05$ and 0.01 as significant, $P < 0.001$ as highly significant.

Criteria for assessment of result:

Table No. 11- Overall assessment criteria

Complete Remission	100 % relief in signs and symptoms.
Marked Relief	76 – 99 % relief in signs and symptoms.
Moderate Relief	51 – 75 % relief in signs and symptoms.
Mild Relief	26 – 50 % relief in signs and symptoms.
Unchanged	Below 25 % relief in signs and symptoms.

Observations and Results:

In the present study, 32 patients were registered and all the patients were completed the therapy. Age wise distribution of registered patients showed that, maximum numbers of patients i.e. 34.37 % were belonging to age group of 41-50 years. Sex wise classification showed that, 53.13 % patients were male and 46.87 % were female. Socio economic status based classification showed that 43.75 % patients were belonging to lower middle class, followed by 31.25 % patients were from middle class.

Etiological factors wise classification showed that maximum number of patients i.e. 56.25 % were having history of ear scratching followed by 40.62 % patients were having history of rhinitis. Unilateral fungal infection was found in most of the patients i.e. 96.87 %. Symptoms based classification showed that earache, itching, ear discharge were present in all the patients while aural blockage was present in 96.97 % patients. Tinnitus was present in 72.73 % patients and 57.58 % patients had complaint of hearing loss. Signs wise classification showed that fungal mass was present in all the patients whereas tragus tenderness and erythema was present in 84.84 % and 93.94 % patients respectively. Whitish type of fungal mass was present in maximum no. of patients i.e. 78.79 %. *Mycelia sterilia* was isolated from maximum number of patients i.e. 60.60 % followed by *Aspergillus flavus* was isolated from 15.63 % patients.

Results:

Effect of therapy on sign and symptoms:

Statistically highly significant results ($p < 0.001$) were found in all the symptoms (i.e. earache, itching, ear discharge, aural blockage, tinnitus) except hearing loss which is significant ($p < 0.05$) in both the groups. Statistically highly significant results ($p < 0.001$) were found in the sign of otomycosis i.e. fungal mass, tragus tenderness and erythema in both the groups.

Table No. 12 - Effect of therapy on symptoms in group A

Symptoms	Mean		S.D.	SEM	t	df	P	Significance
	BT	AT						
Earache	2.313	0.188	0.500	0.125	17.00	15	<0.001	HS
Itching	3.125	0.125	0.516	0.129	23.23	15	<0.001	HS
Ear discharge	1.813	0.125	0.479	0.120	14.10	15	<0.001	HS
Aural blockage	2.250	0.062	0.544	0.136	16.08	15	<0.001	HS
Hearing loss	1.375	0.125	0.707	0.250	05.00	07	<0.05	S
Tinnitus	1.250	0.000	0.452	0.131	09.57	11	<0.001	HS

Table No. 13 - Effect of therapy on signs in group A

Signs	Mean		S.D.	SEM	t	df	P	Significance
	BT	AT						
Fungal mass	1.750	0.062	0.479	0.120	14.10	15	<0.001	HS
Tragus tenderness	2.188	0.188	1.033	0.258	07.74	15	<0.001	HS
Erythema	2.533	0.200	0.617	0.159	14.64	14	<0.001	HS

Table No. 14 - Effect of therapy on symptoms in group B

Symptoms	Mean		S.D.	SEM	t	df	P	Significance
	BT	AT						
Earache	2.471	0.353	0.600	0.146	14.54	16	<0.001	HS
Itching	3.118	0.353	0.664	0.161	17.16	16	<0.001	HS
Ear discharge	1.706	0.294	0.507	0.123	11.47	16	<0.001	HS
Aural blockage	2.125	0.313	0.544	0.136	13.33	15	<0.001	HS
Hearing loss	1.222	0.333	0.601	0.200	04.43	08	<0.05	S
Tinnitus	1.167	0.167	0.426	0.123	08.12	11	<0.001	HS

Table No. 15 - Effect of therapy on signs in group B

Sign	Mean		S.D.	SEM	t	df	P	Significance
	BT	AT						
Fungal mass	1.563	0.250	0.479	0.120	10.96	15	<0.001	HS
Tragus tenderness	2.063	0.375	0.946	0.237	07.13	15	<0.001	HS
Erythema	2.313	0.375	0.680	0.170	11.39	15	<0.001	HS

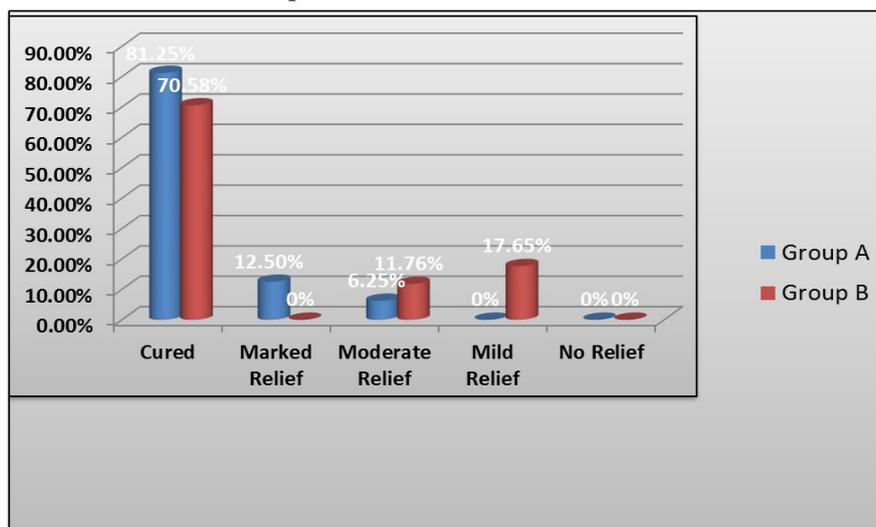
Total effect of therapy:

Out of 16 patients of Group A, 13 patients were cured and marked relief was found in 2 patients and 1 patient had got moderate relief. Among 16 patients (17 ears) of Group B, 12 patients were cured, 2 patients had got moderate relief and 3 patients had got mild relief.

Discussion:

Otomycosis occurs in any age group and chances of occurring otomycosis in both sex equally. On the basis of this study, inferred that itching and earache are most common presenting symptoms of the otomycosis. Common etiological factors are scratching of the ear, water entry of the ear and long standing rhinitis which produce itching in ear. This factors interfere the physiology of the External Auditory Canal. Scratching of the ear, breaks the continuity of the epithelium of External Auditory Canal. Water entry in the ear causes wash out of ear wax which provides protective mechanisms against fungus and bacteria. These all etiological factors provide favorable atmosphere for the fungus.

Graph No. 1- Overall assessment:



Otomycosis occurs more in hot and humid climate because in this climate excessive sweating occurs, which alter pH of External Auditory Canal and provide favorable atmosphere for fungus. In the disease otomycosis, External Auditory Canal develop inflammation & erosion with blackish / whitish thick discharge along with profuse pain, itching which is similar to *Dushta Vrana* in Ayurvedic literature. As these symptoms also similar to *Vata Kaphaja Karnashoola*, it can be correlated with the same. *Vata Kapha Prakriti* people have more chances of occurring otomycosis, due to similarity in *Dosha* which initiates disease.

Probable mode of action:

Hence Honey has *Madhura, Kashaya Rasa* and *Laghu, Ruksha Guna, Ushna Virya*, it alleviates *Vata* and *Kapha Dosha*. (5) *Kashaya Anurasa* dries up the *Kleda & Srava* from *Karnagata Dushta Vrana* and also does *Ropana Karma*. (6) So it helps in healing process of *Vrana*. *Kashaya Rasa* has *Lekhana* property so it scraps the *Dosha* from *Vrana* locally. As *Kashaya Rasa* has *Shoshana* properties, it lyses fungus and bacteria. *Kashaya Rasa* cleans the wound surface and removes foul smell from wounds by destroying the fungus which produce ammonia. Due to osmotic effect of Honey it destroys cell wall of fungus and bacteria, thus it kills fungus, and it creates media in which new fungal growth hampered. Honey has numbers of amino acids, organic acids, therefore Honey has acidic pH (7) and fungus and bacteria could not grow in acidic media and death of exist fungus also occurs in the presence of acidic media.

Conclusion:

The present study opines that Honey have property for lyses process of fungus which provides unfavorable media for fungal growth resulting as fatal for fungus. Honey is equally effective to clotrimazole in the management of otomycosis. It can be considered as a better alternative to the modern treatment modality in the management of otomycosis.

Suggestions for further study:

As this is the first study on the efficacy of Honey (*Madhu*) in the management of Otomycosis (*Karnashoola*) with small sample size; for concrete conclusion it is necessary to use trial drug on large sample size.

Preparation of honey ear drop in diluted form is easy for patient to instill drop in the ear.

Karna Varti soaked with Honey is also the better treatment modality.

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