

A COMPARATIVE STUDY BETWEEN MUPIROCIN AND MAGSULPH-GLYCERINE WICK TREATMENT IN THE MANAGEMENT OF ACUTE OTITIS EXTERNA

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ABSTRACT

BACKGROUND

Acute otitis externa is a common clinical condition seen in ENT out-patient clinic. It presents with ear pain, itching, otorrhoea, oedema or a stuffy feeling in the ear and can be localized or diffused inflammation of external auditory canal. A habit of ear pricking, swimming are the common causes for the acute otitis externa.

The aim and objective of this study is to emphasize on the comparative efficacy of local antibiotic and anti-inflammatory properties of Mupirocin wick and Magsulph-Glycerine wick without systemic drug therapy on an out-patient basis.

MATERIALS AND METHODS

This is a prospective study of 60 patients attending the out-patient clinic of ENT and Head and Neck Surgery, VIMS, Bellary, between the age group of 5 years to 65 years, clinically diagnosed as acute otitis externa. They are randomly selected and divided into two equal groups. In group-I, patients are treated by placing Mupirocin wick in the external auditory canal and compares the outcome with group-II patients who are treated by placing Magsulph-glycerine wick. The clinical outcome is assessed on 3rd, 7th and 10th days using the Wong-Baker faces Rating Scale, 0-10 Numerical Pain Rating Scale, questionnaire and clinical examination.

RESULTS

The statistical results showed that the patients in group-II [Magsulph-Glycerine wick] were relieved from the signs and symptoms early as compared to delayed recovery in group-I [Mupirocin wick].

CONCLUSION

Local treatment of acute otitis externa without systemic drug therapy with Mupirocin wick and Magsulph-Glycerine wick is equally effective except for the difference in the duration of recovery.

KEYWORDS

Otitis Externa, Swimmer's Ear, Tragus Sign, Otagia, Otorrhoea, Magsulph-Glycerine Wick, Mupirocin Wick.

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BACKGROUND

Otitis externa (OE) is a generalized condition of the skin of the external ear canal skin that is characterized by ear canal oedema and erythema associated with itchy discomfort and usually with ear discharge. Inflammation of the skin of the ear canal is the characteristic feature of this disorder.¹ Approximately 10% of the population suffers with this condition during the lifetime, especially in humid climates or from swimming.² The incidence is estimated to be present between 5- 20 percent of all patients with ENT diseases.³ Otitis externa may be subdivided into four categories:

(a) Acute localized otitis externa, (b) Diffuse otitis externa, (c) chronic otitis externa, and (d) malignant otitis externa.⁴ Any condition that disturbs the lipid/acid balance of the ear canal will predispose an individual to otitis externa. OE can be caused due to many predisposing factors i.e. anatomical (narrow external auditory canal), dermatological (eczema), allergic, physiological (humid environment), traumatic (ear probing) and microbiological (bacterial/fungal etc.).⁵ Patients present with pain, itching & ear discharge and reduced hearing. Clinical Signs range from erythema and minimal canal oedema, positive tragus sign, otorrhoea, reduced hearing, cellulitis of pinna and at times accompanied by palpable local lymphadenopathy.⁶

The management of patients with otitis externa includes cleansing of ear canal followed by topical application of antimicrobial agents. It may include local and/or systemic antibiotics with or without steroids.⁷

The purpose of this prospective study is to emphasize on the comparative efficacy of local antibiotic and anti-inflammatory properties of two different drugs, without systemic drug therapy, on out-patient basis.

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MATERIALS AND METHODS

This prospective study includes 60 patients attending the Dept. of ENT and HNS- OPD, VIMS, Bellary, Karnataka between the age group of 5 years and 65 years, of both sexes clinically diagnosed as acute otitis externa, during Jan and Oct 2017. Patients were randomly selected and divided into two groups Group I (n=30) treated with Mupirocin wick and Group II (n=30) with Magsulph-Glycerine wick. The patients with acute and chronic otitis media, trauma, referred otalgia and malignancy of external ear canal were excluded.

The assessment of pain was done before packing the external auditory canal using Wong Bakers faces rating scale.⁸ In children the rating scale was explained to both child and the parent. The pain score was noted on the day of presentation.

A sterile cotton wick smeared with commercially available 2% Mupirocin ointment was placed in the external auditory canal of Group I patients diagnosed as acute otitis externa.

The canal was repacked if the tragal sign was positive on subsequent follow ups and the Numerical pain rating scale (NPRS) recorded.⁹ Repacking of EAC and assessment was done on day 3, day 7 and day 10. Similarly, in Group II, a sterile cotton wick of Magsulph-glycerine was used for EAC packing in clinically diagnosed acute otitis externa cases.

The management outcome data and results are subjected for statistical analysis. The clinical outcome is assessed on 3rd, 7th and 10th days in both groups using the standard Wong-Baker faces Rating Scale, NPS and questionnaire with clinical examination.

Ethics

This study was approved by the Ethical committee and institution review board of Vijaynagar Institution of Medical Sciences, Ballari under Rajiv Gandhi University of Health Sciences, Bengaluru, Karnataka, India.

Statistical Analysis

- Qualitative data was represented in the form of frequency and percentage.
- Quantitative data was represented using mean & Sd. Analysis of quantitative data within the groups was done using paired t test and inter group comparison with unpaired t test if data passes 'Normality test'.
- A P value of <0.05 was considered statistically significant.
- Statistical analysis done with IBM SPSS version 22 for Windows.

RESULTS

Our study included patients between the age 5 years to 65 years of age. Maximum patients in our study were under 20 years of age (Table-1).

Age (In Yrs.)	Mupirocin Wick Group (n=30)	Magsulph-Glycerine Wick (n=30)
< 10 yrs.	9	4
10-19	9	13
20-29	7	7
30 -39	2	3
40 & Above	3	3

Table 1. Age Distribution

Group I (n=30) patients were treated with Mupirocin wick and Group II (n=30) patients treated with Magsulph-glycerine wick.

Sex	Mupirocin Wick Group (N=30)	Magsulph-Glycerine Wick (N=30)
Male	19	21
Female	11	9

Table 2. Sex Distribution

There were 40 males and 20 females patients in the study (Table-2).

Diagnoses	Mupirocin Wick Group (N=30)	Magsulph-Glycerine Wick (N=30)
Generalised	15	17
Localised	15	13

Table 3. Types of Acute Otitis Externa

Left sided acute otitis media was more commonly found than the right side. The common signs were canal oedema, discharge and swelling. One patient had granulations in the ear canal. 32 patients were diagnosed as generalised acute otitis media and 28 patients diagnosed as localised acute otitis media (Table-3).

Magsulph-Glycerine Wick Group					
Assessment	Mean	Std. Deviation	Wicoxon Signed Ranks Test		
			Day-3 Vs. Day-7	Day-3 Vs. Day-10	Day-7 Vs. Day-10
DAY-3	5.67	1.18	P<0.000	P<0.000	P<0.000
DAY-7	2.87	1.25			
DAY-10	0.10	0.31			

Table 4. Comparative VAS Scores of Group II

Post treatment statistical analysis was done in both groups on day 3, day 7 and day 10 (Table-4).

Mupirocin Wick Group					
Assessment	Mean	Std. Deviation	Paired t Test		
			Day-3 Vs. Day-7	Day-3 Vs. Day-10	Day-7 Vs. Day-10
DAY-3	6.80	0.99	P<0.000	P<0.000	P<0.000
DAY-7	4.13	0.51			
DAY-10	1.37	0.66			

Table 5. Comparative VAS Scores of Group I

The mean value of VAS score of pre and post treatment was compared, in both groups. The duration of symptom relief was assessed in both groups.

The p value was significant for symptoms in both groups for local treatment when compared on day 3, day 7 and day 10 (Table-5).

Reduction of pain in VAS on 10th day					
Groups	N	Total Score	Mean	Std. Deviation	P Value
Mupirocin Wick Group	30	4.1	1.37	0.67	P<0.000
Magsulph-Glycerine Wick	30	3	0.10	0.31	

Table 6. Comparison of Pain Reduction between the Two Groups in Terms of Duration

The duration of symptom relief was early in Magsulph-Glycerine group as compared to that of Mupirocin group (Table-6).

DISCUSSION

Acute otitis externa is the most common infection of the external auditory canal. It is more common in hot and humid conditions and in swimmers. It is also known as "swimmer's ear," "tropical ear," or "Singapore ear". It can range from a mild inflammation to a potentially life-threatening disease in adults known as necrotizing otitis externa.¹ The most common cause of otitis externa is a bacterial infection, although fungal overgrowth is a principal cause in 10 percent of cases.²

Otitis externa can also result from any of a broad range of non-infectious dermatologic processes. The characteristic structure of the ear canal favours to the development of otitis externa. It is the only skin lined cul-de-sac in the human body. The external auditory canal is warm, humid and the presence of hairs, making it a favourable environment for bacterial and fungal growth. The ear canal skin is thin and hence is easily traumatized. The curve at the bony-cartilaginous junction impedes the exit of debris, secretions and foreign bodies. The external auditory canal has some special defence mechanisms. Cerumen creates an acidic coat containing lysozymes and other substances that inhibit bacterial and fungal growth. The lipid-rich cerumen is also hydrophobic and prevents water from penetrating to the skin and causing maceration. Too little cerumen can predispose the ear canal to infection, but cerumen that is excessive or too viscous can lead to obstruction, retention of water and debris, impaction and infection. Additionally, the unique epithelial migratory property of the canal skin protects from infection. Otitis externa results when these defences fail or when the epithelium of the ear canal is injured.¹⁰

The patient's history and physical examination, including otoscopy, usually provide sufficient information for the clinician to make the diagnosis of OE. Note that a patient who is diabetic or immune-compromised with severe pain in the ear should have necrotizing OE excluded by an otolaryngologist.^{5,10}

In the majority of published clinical studies on the treatment of otitis externa, pain, swelling, otorrhoea, and

erythema are evaluated as typical parameters for rating the clinical signs.¹⁰

An uncomplicated infection can normally be treated by cleaning of the meatus by an ENT specialist and local application of a broad-spectrum antibiotic or an antiseptic.¹¹

Otitis externa is most commonly caused by bacteria, especially *Staphylococcus aureus* and *Pseudomonas aeruginosa*.^{10,11,12,13,14,15}

Rapid and effective control of pain is the basic part in the management of acute otitis externa. Aural packing is targeted to reduce the pain. As both gram positive and gram-negative bacteria cause infections of the external ear, antimicrobial preparations with broad spectrum activity are required for its effective treatment.¹³ Topical medications will not be able to penetrate an oedematous canal. Insertion of wick is a better topical therapy of otitis externa than instilling ear drops, as it overcomes the problem of penetration.¹⁴

Bacterial otitis externa in its mild form can be accompanied by only minor pain and subdued swelling.¹⁴ In its severe form, however, the symptoms are associated with excruciating pain, otorrhoea, and complete closure of the external auditory canal.

The systemic antibiotics are used in persistent OE or in complicated otitis externa.^{10,16}

Topical antibiotics are recommended as initial therapy for its safety and efficacy.¹¹

Adhikari compared 10% Icthammol glycerine wick with steroid antibiotic wick in treatment of otitis externa in children. They found the use of steroid-antibiotic drop wick cause early pain relief and a statistical significant decrease in number of visits in steroid antibiotic group.¹⁷

There is paucity of studies comparing two drugs in ointment forms in the treatment of acute otitis externa. In our study we have compared two drugs in ointment forms used as ear wick in the local treatment of acute otitis externa. No systemic antibiotic was given to any patient in both the groups.

Topical medications will not be able to penetrate an oedematous canal wall, a problem that can be overcome by the insertion of an ear wick. Hence insertion of wick is a better topical therapy of otitis externa than instilling ear drops.¹²

Magnesium sulphate have anti-inflammatory and hygroscopic properties which help in reducing the oedema and pain in acute otitis externa. Glycerine has emollient property and hence give soothing effect.¹⁸

Topical Mupirocin 2% is effective bactericidal agent and also has anti-inflammatory property. It is active against a wide range of gram-positive bacteria including methicillin-resistant *Staphylococcus aureus* (MRSA). It is also active against certain gram-negative bacteria. Mupirocin inhibits bacterial protein synthesis by reversibly and specifically binding to bacterial isoleucyl transfer-RNA synthetase. Due to this unique mode of action, Mupirocin demonstrates no in vitro cross-resistance with other classes of antimicrobial agents.¹⁹

Study performed by Bhatt et al.¹³ showed statistically significant decrease in pain and number of visits in steroid-

antibiotic group as compared to 10% ichthammol glycerine pack.

Masood et al.²⁰ in their randomized control trial found no difference in pain parameters when steroid pack was compared with 10% IG pack.

Similar prospective study done by Hernigold et al²¹ failed to show any difference. But, Masood et al had used steroid pack only whereas, Hernigold et al had used ear drop only.

In our study there was significant reduction of pain and oedema in both groups on 2nd and 3rd visit (p value <0.000). Both the drugs showed equal results, however there was a difference in the duration of recovery of symptoms. Patients treated with the Magsulph-Glycerine wick group (II) relieved of their symptoms early compared to the Mupirocin wick group (I). We did not find any side effects so far in the both groups.

CONCLUSION

Local treatment of acute otitis externa without systemic drug therapy with Mupirocin wick and Magsulph-Glycerine wick is equally effective except for the difference in the duration of recovery.

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