



COMPARISON BETWEEN ANALGESIC AND ANTI-INFLAMMATORY ACTION OF STEROID-ANTIBIOTIC EAR WICK WITH GLYCERINE-MAGNESIUM SULPHATE-ANTIBIOTIC EAR WICK IN TREATMENT OF ACUTE OTITIS EXTERNA

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ABSTRACT

Aim: To compare the efficacy of Steroid-Antibiotic ear wick with Glycerine-Magnesium Sulphate-Antibiotic ear wick, in immediate pain relief and reduction of external auditory canal edema in Acute Otitis Externa. **Methodology:** A randomized clinical trial was carried out on 60 patients with Acute Otitis Externa, of age group 18-70 years, meeting the inclusion and exclusion criteria, in a tertiary care hospital. The pain at the time of presentation was assessed with 'Numeric Rating Scale' and canal edema was assessed by dividing the canal in two quadrants, giving score of 50% for each. Steroid-Antibiotic ear wick and Glycerine-Magnesium Sulphate-Antibiotic ear wick was used as ear pack in alternate patients. Pain and canal edema was assessed every 24 hours till it completely subsided. **Results:** Steroid-Antibiotic group was better in terms of immediate pain relief and had faster relief of canal edema as compared to Glycerine-Magnesium Sulphate-Antibiotic group. **Conclusion:** Steroid-Antibiotic ear wick has better analgesic and anti-inflammatory action compared to Glycerine-Magnesium Sulphate-Antibiotic ear wick and hence is more effective in the treatment of Acute Otitis Externa.

KEYWORDS

Acute Otitis Externa, Steroid-Antibiotic Ear Wick, Glycerine-Magnesium Sulphate-Antibiotic Ear Wick.

INTRODUCTION:

Otitis Externa is a condition that effects the skin of the external auditory canal, characterized by inflammation and edema of the external auditory canal.¹ Edema is the main cause of disruption of blood supply to the periosteal lining of bony canal and irritation of the nerve endings leading to extreme pain in otitis externa.² It is common in humid climates and also commonly acquired during swimming, hence known as 'Swimmers Ear'.

Otitis Externa can be caused due to many predisposing factors such as: narrow canal, eczema, allergic, humidity, trauma and microbiological (bacterial/fungal).³ There are many other predisposing factors including hearing aid use, continuous exposure to water, foreign body reaction and systemic conditions like diabetes mellitus. Although widely believed to be infective in origin, many studies show that only 40% of cases could be attributed to a primary microbial cause. Common pathogens implicated in are *Pseudomonas aeruginosa* (50%), *Staphylococcus aureus* (23%), Anaerobes and Gram-negative organisms (12.5%) and Yeasts (12.5%).⁴

Acute Otitis Externa is diagnosed from the history and otoscopy or otomicroscopic examination of the ear canal and tympanic membrane (if visible). The characteristic symptom of Otitis Externa is severe ear pain (otalgia). The pain is typically worsened by pressure on the tragus (tragal tenderness). Further symptoms are otorrhoea, itching, erythema and edema of the ear canal, potentially leading to conductive hearing loss.

The aim of treating the patient is to free him/her from the symptoms and getting rid-of any pathogen causing a specific infection. It is usually treated by different combinations of systemic antibiotics, local aural toilet, topical antibiotic drops, analgesics and anti-inflammatory drugs. Aural packing also helps in treatment of Otitis Externa. It acts by its chemical ingredients and also mechanically by splinting action pressing the soft tissues towards the non-distended position.⁵ Aural packing is usually done with Ichthammol (Ammonium bituminosulfonate) glycerine or magnesium sulphate or steroid-antibiotic cream. Magnesium sulphate and glycerine are hygroscopic in nature and helps in reducing inflammation and edema.⁶ Steroid mainly helps in reduction of edema by its anti-inflammatory action and its action on the capillary wall tone.⁷ Ear wick helps in immediate relief of edema and pain.

Objectives:

1. To determine the clinical efficacy of steroid-antibiotic ear wick in immediate relief of pain and reduction of edema in Acute Otitis

Externa.

2. To determine the clinical efficacy of glycerine-magnesium sulphate-antibiotic ear wick in immediate relief of pain and reduction of edema in Acute Otitis Externa.
3. To compare the clinical efficacy of steroid-antibiotic ear wick with glycerine-magnesium sulphate-antibiotic ear wick in immediate relief of pain and reduction of edema in Acute Otitis Externa.

MATERIALS AND METHODS:

With our institutional scientific and ethics board approval, a randomized clinical trial was carried out on 60 patients of age group 15 – 70 years, for a duration of 6 months from September 2023 to February 2024, who were willing to give written informed consent and were clinically confirmed cases of Acute Otitis Externa, visiting the ENT OPD at KVG Medical College and Hospital, Sullia, Dakshina Kannada, Karnataka.

Sample size calculation:

Based on the ENT OPD records of our hospital, the prevalence of Otitis Externa was found to be 2%. Hence Sample size was calculated using the formula $Z^2p(1-p)/d^2$, where $p = 2\%$, $Z = 1.96$, $d = 5\%$.

Sample size = $Z^2p(1-p)/d^2 = (1.96)^2 \times 2 \times 98 / 52 = 3.84 \times 2(98) / 25 = 30$. Based on our calculation, it was decided to take 30 patients in each group.

60 Otitis Externa patients were made to pick chits numbered from 1 to 60. Odd numbers were allotted to group 1 (glycerine-magnesium sulphate-antibiotic group) and even numbers were allotted to group 2 (steroid-antibiotic group).

Inclusion criteria:

Patients of both gender of age group 15 – 70 years.
Patients who were clinically confirmed cases of Acute Otitis Externa.

Exclusion criteria:

Patients with history of trauma to ear.
Patients who were not willing to give written informed consent.
Patients with pre-existing middle ear pathology like Chronic Otitis Media or Acute Otitis Media.
Patients with overt congenital anomalies of external ear/ middle ear.
Patients who had undergone prior ear surgeries.
Patients with history of skin allergy of the external auditory meatus.
Patients with Perichondritis of pinna.
Patients with Impacted wax or a foreign body in external auditory canal.

Patients with allergy to Glycerine or Magnesium sulphate.
 Patients with Diabetes.
 Patients with Otomycosis.
 Patients with Malignant Otitis Externa.

Detailed history of the patient was taken and detailed clinical examination was done. Detailed examination of the ear was carried out. The pain at the time of presentation was assessed with the help of 'Numeric Rating Scale', where 0 meant no pain and 10 meant extreme pain.⁵ Similarly scoring of the edema of the external auditory canal was done by dividing the canal in two parts with 50% for each and scoring was performed as per the percentage of the involvement of canal.²

The affected ear was packed with either steroid-antibiotic ear wick or with glycerine-magnesium sulphate-antibiotic ear wick. For steroid-antibiotic ear wick we used a sterile gauze with 0.1% Betamethasone and 0.5% Neomycin Sulphate ointment. For glycerine-magnesium sulphate-antibiotic ear wick we used a sterile gauze with glycerine-magnesium sulphate paste and 0.5% Neomycin Sulphate ointment. To comply with therapeutic guidelines and to offer the patient a rescue medication, the same systemic antibiotic (Amoxicillin + Clavulanate) was prescribed to all patients for 5 days. No systemic analgesics were given.

The patient was asked to follow up after 24 hours and the pain and canal edema was assessed again. Assessment and repacking done every 24 hours till tragal tenderness disappeared and edema subsided completely. Statistical analysis was done by using Mann Whitney U Test to compare average of pain scores in two groups.

RESULTS:

The total number of patients included in the study was 60. Among them 31 (52%) were males and 29 (48%) were females (Figure 1). The age group ranged from 15 to 70 years (mean = 42.5) (Figure 2).

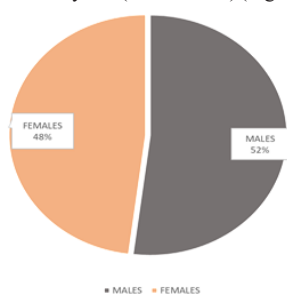


Figure 1: Gender distribution of the study

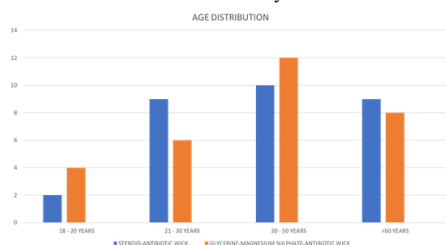


Figure 2: Age distribution of the study

There was a statistically significant decrease in pain within the first 24 hours ($p = 0.0200$), in Steroid-Antibiotic group as compared to Glycerine-Magnesium Sulphate-Antibiotic group (Table 1).

Table 1: Time taken for complete relief of pain

TIME TAKEN FOR PAIN TO SUBSIDE COMPLETELY	STERIOD-ANTIBIOTIC EAR WICK (N=30)	GLYCERINE-MAGNESIUM SULPHATE-ANTIBIOTIC EAR WICK (N=30)
24 HOURS	20	12
48 HOURS	10	14
72 HOURS	0	4

In Steroid-Antibiotic group, all patients were relieved of canal edema by 48 hours, whereas in Glycerine-Magnesium Sulphate-Antibiotic group it took 72 hours for all patients to be completely relieved of canal

edema.

In Steroid-Antibiotic group, the maximum number of visits was found to be 3 visits, whereas in Glycerine-Magnesium Sulphate-Antibiotic group, it was 4 visits. There was a decrease in the total number of visits with Steroid-Antibiotic group when compared to Glycerine-Magnesium Sulphate-Antibiotic group (Table 2).

Table 2: Number of visits

VISITS UNTIL COMPLETE RECOVERY	STERIOD-ANTIBIOTIC EAR WICK (N=30)	GLYCERINE-MAGNESIUM SULPHATE-ANTIBIOTIC EAR WICK (N=30)
2 VISITS	20	12
3 VISITS	10	14
4 VISITS	0	4

DISCUSSION:

Acute Otitis Externa is a common condition of the external ear that causes severe pain and disrupts daily life activities. Medicated ear wick is a commonly used modality of treatment which helps in relief of pain and edema.

In our study, Steroid-Antibiotic ear wick was found to have better analgesic and anti-inflammatory action compared to Glycerine-Magnesium Sulphate-Antibiotic ear wick. This is similar to the results obtained in studies performed by Avishek Dhiman et al., on 60 patients and Shrestha BL et al., on 82 patients.^{2,6}

Masood et al. and Hornigold et al. found no difference in pain relief between steroid and Ichthammol-glycerine pack in their respective studies conducted on 60 patients each.^{3,4} The former had used steroid ear pack while the latter had used steroid drops. In contrast, a study conducted by Bilal Hussain et al., on 70 patients, concluded that ichthammol-glycerine wick is more effective than steroid antibiotic ear drops in immediate relief of pain in acute otitis externa.¹

Topical ear drops will not be able to penetrate an edematous canal. Insertion of wick is a better topical therapy of otitis externa than instilling ear drops, as it overcomes the problem of penetration. Antibiotic resistance and quality of ear drops is another reason for comparatively slower and less relief of pain on using ear drops compared to ear wick. In our study, both Steroid-Antibiotic wick and Glycerine-Magnesium Sulphate-Antibiotic wick were found to be effective but the former had a slightly better and faster results in terms of duration taken for complete recovery.

CONCLUSION:

Both Steroid-Antibiotic ear wick and Glycerine-Magnesium Sulphate-Antibiotic ear wick are effective in the treatment of Acute Otitis Externa, but, in our institutional study, Steroid-Antibiotic ear wick was found to have a better analgesic and anti-inflammatory action.

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