Efficacy of E-7 Eye Drops (Ophthacare) in Acute Conjunctivitis

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ABSTRACT

A study was conducted to evaluate the efficacy of E-7 Eye Drops (Ophthacare), a herbal formulation, in 50 patients with an attack of acute conjunctivitis. A conjunctival smear was taken and sent for microbiological examination. After identifying the pathogens responsible for acute conjunctivitis, the patients were instructed to instil 2 drops of E-7 Eye Drops (Ophthacare) in each eye 4 to 5 times a day. A significant response was observed in 35 patients (70%), who were completely cured after 7 days and the remaining 10 patients (20%), after 15 days. On completion of the therapy, a repeat conjunctival smear confirmed the absence of pathogens and all the patients reported that they were totally symptom-free. None of them experienced any adverse reactions.

INTRODUCTION

Inflammation of the conjunctiva is a common condition, which causes discomfort and annoyance. Though conjunctivitis occurs in different forms with varying degrees of severity, either in acute or chronic stage, certain pathological features remain common to all. The fundamental characteristics of inflammation are hyperaemia, stasis, exudation of cells and fibrin rich oedematous fluid from the highly vascular blood supply. A variety of physical findings can be seen in patients with conjunctivitis. Assessing the time course, the morphologic appearance of conjunctiva, type of exudate and most severely affected area of conjunctiva are critical factors in acute conjunctivitis (Margo1).

Several eye preparations have been introduced in the past few years. Simultaneously, there is an increasing incidence of epidemic, multiple-antibiotic resistance and drug reaction. Ayurveda, as an alternative therapy, has several herbs which are known for their anti-inflammatory and analgesic properties, and are been found to be effective in various eye disorders (Katharia et al.2, Rusia, Srivastava3, Nanir, Kadu4, Naqvi et al.5). To evaluate the efficacy of E-7 Eye Drops (Ophthacare) in acute conjunctivitis, a clinical trial was conducted at The Regional Institute of Ophthalmology, Bangalore, India.

E-7 Eye Drops (Ophthacare) contains herbs with the following basic principles:- *Carum copticum* (Yawani) has been shown to possess antibiotic activity against *Salmonella typhi*, *Micrococcus pyogenes* var. *aureus* and *Escherichia coli* (Krishna, Badhwar6, Bhatnagar et al.7); *Terminalia belerica* (Bahira) has been used in various eye disorders and when combined with honey, it has shown antibacterial properties against *Micrococcus pyogenes* var. *aureus* and *Escherichia coli* (Kapil et al.8, Tambvekar9, Nadkarni, Nadkarni10); *Emblica officinalis* (Amalaki) is effective in treating inflammation
of the eyes; its flowers are known to have a cooling effect on the eyes (Satyavati et al.11); *Curcuma longa* (Haridra) has an anti-inflammatory activity which is comparable to hydrocortisone acetate and phenyl butazone (Arora et al.12) and the antibacterial activity was comparable to penicillin and streptomycin on gram-positive and gram-negative organisms (Basu13); *Ocimum sanctum* (Tulasi) possesses antimicrobial and anti-inflammatory activities which help in healing inflammation (Thaker, Anjaria14, Varde et al.15). The ethanolic extract (50%) of the fruits of *Cinnamomum camphora* (Karpoor) showed antibacterial activity against several gram-positive and gram-negative bacteria (Adhikari et al.16, Thind and Suri17); *Mel despumatum* (Makshika) has been recommended as an effective remedy in conjunctivitis. Honey is reported to prevent infection and promote healing; the effect of its ingredients can be compared with antibiotics. Honey is easily absorbed into the tissues (Schweisheimer18) and was found helpful in preserving healthy cornea, enucleated within 6 hours after death (Lavingia19). It has bactericidal as well as bacteriostatic properties. It inhibits the growth of *Escherichia coli, Haemophilus influenzae, Proteus, Pseudomonas aeruginosa, Staphylococcus aureus, Streptococcus pyogenes, Salmonella species and vibrio cholerae* (Molan20).

The following stability procedure was followed in the preparation of the eye drops under aseptic conditions. The individual herbs mentioned above were standardised by gas chromatographic method using Netel chromatograph. A 10% carbowax 20 M (3 metre, 1/8 inch IP) stainless steel column was used for the separation. Nitrogen was used as carrier gas at the flow rate of 30 ml/min., and the compounds were detected using Flame Ionisation Detector (FID).

The filling of the eye drops prepared according to the above method was done in a sterile condition in an aseptic area using 0.2 m sterile filtration units.

**METHODS**

Fifty patients with signs and symptoms of acute conjunctivitis were enrolled in the trial. They were of either sex, aged between 20 to 50 years. Patients suffering from chronic conjunctivitis of known aetiology, i.e. vernal catarrh, phlyctenular and chemical injuries; predominant keratitis/corneal ulcer and keratoconjunctivitis sicca, were excluded from the study. An informed consent was obtained from all the patients who were included in the trial. A careful history was taken and a detailed ophthalmologic examination was done. All the patients were examined for signs and symptoms and their severity was recorded. Most of them presented with hyperaemia, discharge (both watery and mucopurulent), foreign body sensation and itching. A conjunctival smear was taken from all the patients and this was sent for culture on blood agar, MacConkey agar and nutrient agar. It was incubated at 37°C for 18 to 24 hours. After identifying the growth, it was subjected to gram staining for gram-positive/gram-negative organisms. The presence of gram-positive cocci in clusters was established by catalase and coagulase tests and the presence of gram-negative cocci was found by motility, indol, methyl red Voges-Proskauer, urease, Simmons citrate and triple sugar iron agar tests. The pseudomonas species was identified by oxidase test. The patients were advised to instill E-7 Eye Drops (Ophthacare) at a dose of 2 drops in each eye 4 to 5 times per day, for 7 to 15 days.

**RESULTS**

In the diagnosis and management of eye-related disorders, it is essential that the physician is familiar not only with the findings representative of the various clinical forms of bacterial conjunctivitis but also with the bacteria known to be responsible for its occurrence. The conjunctival sac is rarely without being infected by organisms, but owing to its relatively low temperature due to exposure, evaporation of lacrimal fluid and moderate blood supply, bacteria do not readily propagate themselves. Organisms
normally present are non-pathogenic, but some of them are morphologically identical with pathogenic types (Miller\textsuperscript{21}). It has been reported by Boustcha and Nicolle\textsuperscript{22} that bacterial pathogens were isolated from 38\% of the patients who suffered from acute conjunctivitis (Payman et al\textsuperscript{23}). In this trial, it was observed that several bacteria are involved in the pathogenesis of conjunctivitis such as \textit{Staphylococcus aureus}, \textit{Escherichia coli}, \textit{Streptococcus}, \textit{Beta-haemolytic streptococcus} and \textit{Proteus}. In 50\% of the patients, pathogens could not be isolated. The conjunctival smear of the patients, showing different organisms and their percentage of infection, are shown in Table 1.

<table>
<thead>
<tr>
<th>No. of Cases</th>
<th>Pathogens isolated</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>\textit{Staphylococcus aureus}</td>
</tr>
<tr>
<td>3</td>
<td>\textit{Escherichia coli}</td>
</tr>
<tr>
<td>5</td>
<td>\textit{Streptococcus}</td>
</tr>
<tr>
<td>4</td>
<td>\textit{Beta-haemolytic streptococcus}</td>
</tr>
<tr>
<td>5</td>
<td>\textit{Proteus}</td>
</tr>
<tr>
<td>25</td>
<td>No growth suggesting a viral infection</td>
</tr>
</tbody>
</table>

Thirty-five patients (70\%) reported immediate relief after the treatment with E-7 Eye Drops (Ophthacare) and they were totally symptom-free after 7 days. Another 10 patients (20\%) responded after 14 days. Three patients did not respond to the treatment. Two patients who did not report for follow-up, were excluded from the trial.

**DISCUSSION**

While many antibacterial agents have similar spectra of activity, they are not equally potent against several organisms and vary in their pharmacokinetic properties (Neu\textsuperscript{24}). Many researchers have shown that herbal eye preparations can be used to treat various eye ailments (Paul et al\textsuperscript{25}). The above study showed that the E-7 Eye Drops (Ophthacare) were effective in cases of acute conjunctivitis. No adverse effect or toxic manifestation was observed in any of the patients included in this trial. Hence, this study indicates that E-7 Eye Drops (Ophthacare) can be useful and cost-effective in treating cases of acute conjunctivitis.

**REFERENCES**