

RESEARCH ARTICLE

Therapeutic Efficacy of Different Ear Cleanser in Management of Canine Otitis

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ABSTRACT

The objective of this study was to compare the therapeutic efficacy of three different ear cleansers in 30 dogs of various breeds suffering from otitis. Based on history and clinical signs, ear exudates were collected by aseptic cotton swab for isolation and identification of organisms. The cerumen deposition in ear canal was cleared using one of the ear preparations, viz., ear cleanser-I (0.2 % salicylic acid and 0.3 % phenoxyethanol) ear cleanser - II (chlorhexidine, propylene glycol and tris-EDTA) or ear cleanser-III (2% para-dichlorobenzene, benzocaine 2.7%, chlorbutol 5% and turpentine oil 15 %). Systemic/local antibiotics were used as per sensitivity testing. The treatment protocol found effective in the management of ear infections included cleaning the ear debris using ceruminolytic preparations/ear wax dissolvent, viz, ear drop. Ear cleanser-III showed excellent results (100%) in ceruminous as well as bacterial otitis with subsequent instillation of ear preparations containing antibacterial drug(s) and antifungal agents compared to cleanser-II (90%) and cleanser-I (70%).

Keywords: Canine otitis, Dogs, Ear cleanser, Therapeutic Management

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INTRODUCTION

Canine otitis is an inflammation of the ear in dogs. Otitis has a multifactorial etiology. Bacteria like *Staphylococcus*, *Pseudomonas*, *Proteus*, *Klebsiella* as well as fungi like *Malassezia* and *Candida* are known to play a major role. Otitis externa is defined as an acute or chronic inflammation of the epithelium of the external ear canal which may also involve the pinna. Otitis externa is one of the most common and multifactorial disorders accounting for up to 10-20 % of consultations in canine practice (Scott *et al.*, 2001). In otitis, the clinical signs are head shaking, pruritus, foul-smelling discharge, pain, and reddening of the ear mucosa (Cole, 2004). Diagnosis of otitis is based on otic examination and cytology of otic discharge. The *in vitro* antibiotic sensitivity patterns of the microorganisms isolated help in the selection of effective drugs for successful therapy (Batra *et al.*, 2005; Hernandez *et al.*, 2012). The prime target of therapy of otitis aims at the elimination of the underlying cause(s), cleaning the ear canal and middle ear, applying topical therapies, and administering systemic medication. Otic cleansers contain ceruminolytics, detergents, and lubricants. Some of the acid-containing products (e.g., salicylic acid, acetic acid and lactic acid) have anti-microbial activity against bacteria and *Malassezia* yeasts. This work was planned to evaluate the therapeutic efficacy of three different ear cleanser without and with different antimicrobials in the cases of canine otitis.

MATERIAL AND METHODS

Thirty cases of otitis infection in dogs that were presented at the Veterinary Clinical Complex of the College at Anand and at Vcare Lakdikui, Vadodara, were selected for the

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present study. The affected dogs were divided into three equal groups, viz., Group-I, Group-II, Group- III, each of 10 dogs. Ten healthy dogs were also used as a control for comparison. The diagnosis was based on an otic examination and cytological examination. The *in vitro* antibiotic sensitivity testing was performed for the selection of effective drugs for successful therapy. The treatment protocol which was used in treating the ear infections included ear cleaning with the particular cleanser on the day of initiation of therapy, prior to the application of medicament in all the affected ears (Table 1). Initially, ear debris was cleared by application of ceruminolytic agents, and base of the ear was massaged for 20-30 seconds to soften and release the debris. Then with cotton, the debris and excess fluid was wiped out. Afterward,

Table 1: Groups of otitic dogs used in a therapeutic trial

Group	No. of otitic dogs	Ear cleanser used	Frequency of administration of ear cleanser
I	10	Salicylic acid (0.2%) and Phenoxyethanol (0.3%)	Once a day for a week or until recovery
II	10	Chlorhexidine, Propylene glycol and Tris-EDTA	Once a day for a week or until recovery
III	10	Para dichlorobenzene (2%), Benzocaine (2.7%), Chlorbutol (5%), Turpentine oil (15 %)	Once a day for a week or until recovery

ears were cleaned with sterile normal saline using a cut down (Little, 1991). Owners were advised to use ceruminolytics for the first three days prior to the use of ear drops and wipe the discharge with cotton.

Based on the results of *in vitro* drug sensitivity testing, preparations containing effective antibacterial/ antifungal drugs were used either for instillation in the affected ear or by the oral route. If needed, both the routes of drug administration were used in some cases. Therapy, which included cleaning, topical, and systemic therapy, was aimed at resolving or removing the primary factors, reducing inflammation, and resolving secondary infections. All the cases under study were monitored at 7, 14, and 21 days after the last topical and/or systemic treatment by taking samples for bacteriological and mycological culture examination. The results of the time taken (days) of clinical recovery were presented as mean \pm standard error (SE) (Snedecor and Cochran, 1994).

RESULTS AND DISCUSSION

Dogs suffering from otitis were divided into three groups based on the therapeutic protocol. In Group-I, infected ears of 10 otitic dogs were instilled with ear cleanser-I alone once daily (Table 1). Complete recovery was noticed in seven cases of otitis caused by *Staphylococcus aureus*, *S. pseudintermedius*, *Streptococcus* spp., *Escherichia coli*,

Klebsiella spp., *Pseudomonas* spp., *Candida* spp., and *M. pachydermatis*. Recurrence was observed in three cases of otitis caused by *Pseudomonas* spp. *Klebsiella* spp., *Candida* spp. in association with *M. pachydermatis*, which were treated with oral administration of moxifloxacin @ 5–10 mg/kg b.wt. and ketoconazole @ 10 mg/kg b.wt. twice daily. Complete recovery of lesions was noticed in 70 % cases of otitis in dogs with instillation of ear cleanser-I drops with systemic antibiotics (Table 2). The clinical recovery was recorded with the treatment days of 14–30 with the mean of 21.40 ± 1.69 days (Table 3). Cole *et al.* (2003) evaluated the *in vivo* efficacy of an ear cleanser containing 2.5% lactic acid and 0.1% salicylic acid for the treatment of infectious otitis externa and reported resolution of infection in 67.7 % of the ears.

In Group II, infected ears of 10 otitic dogs were instilled with ear cleanser-II, once daily, along with systemic antimicrobial drugs (Table 1). This treatment regimen was found to be effective in cases of otitis caused by *Staphylococcus aureus*, *S. pseudintermedius*, *Escherichia coli*, *Pseudomonas* spp., *M. pachydermatis* and *Aspergillus* spp. resulting in complete resolution of lesions in 90 % cases of otitis in dogs (Table 2). After recurrence in one case, it was treated with oral administration of enrofloxacin @ 10 mg/kg b.wt. twice daily and topical antibacterial drop (ciprofloxacin) @ 4-6 drops applied two times after cleaning the ear canal. The clinical recovery was recorded in different dogs with

Table 2: Number of recovered cases in different treatment groups

Group/Ear cleanser	No. of cases recovered (%)	No. of cases with recurrence (%)
Group-I (n = 10) Ear Cleanser-I + systemic/local antibiotics	7 (70.00)	3 (30.00)
Group- II (n = 10) Ear Cleanser-II + systemic/local antibiotics	9 (90.00)	1 (10.00)
Group-III (n=10) Ear Cleanser-III + systemic/local antibiotics & antifungals	10 (100.00)	0

Table 3: Clinical recovery time (days) in different treatment groups of otitic dogs

Sr.No. / Otitic dogs	Clinical recovery time (days)		
	Group-I (Ear cleanser-I)	Group-II (Ear cleanser-II)	Group-III (Ear cleanser-III)
1	14	21	14
2	30	14	14
3	21	14	21
4	30	21	14
5	21	14	14
6	21	21	14
7	21	21	14
8	21	14	14
9	21	14	7
10	14	21	7
Mean \pm SE (days)	21.40 \pm 1.69	17.50 \pm 1.17	13.30 \pm 1.26



the treatment days of 14–21 with a mean of 17.50 ± 1.17 days (Table 3). Sharma *et al.* (2016) used ear cleanser solution (chlorhexidine, propylene glycol, and Tris-EDTA) for cleaning of the ear canal of 12 dogs affected with chronic otitis and complete clinical improvement was recorded after 21 days of treatment.

In Group III, dogs were treated with instillation of ear cleanser - III (Table 1) once daily, either alone or with topical/systemic antimicrobial drugs. Complete recovery was noticed in all 10 (100%) cases of otitis caused by *Staphylococcus aureus*, *S. pseudintermedius*, *Streptococcus* spp., *Escherichia coli*, *Aspergillus* spp. and *Malassezia pachydermatis*. No recurrence was observed in any case. In this group, mostly for fungal organisms oral administration of ketoconazole @ 5–10 mg/kg b.wt. and for mixed infection topical ear drop (Gentamicin sulphate 0.3% w/v, Beclomethazone dipropionate 0.025 %, Clotrimazole 1%, Lignocaine hydrochloride 2% w/v) was given @ 2-4 drop after cleaning the ear canal. Systemic antibacterial drugs like azithromycin, ciprofloxacin, amoxicilline-clavulanic acid, linezolid, clindamycin were used. The clinical recovery was recorded in treatment days of 7–21 with a mean of 13.30 ± 1.26 days. In earlier work on canine otitis externa, ear preparation containing dioctylsodium sulphosuccinate or para-dichlorobenzene have been reported to be very effective ear cleansers (Nair, 2004; Kalorey *et al.*, 2004; Mhatre, 2005). Some cases of otitis with inflammatory lesions and intense pruritus were treated besides antibiotics with oral administration of non-steroidal anti-inflammatory drugs meloxicam and nimesulide.

CONCLUSION

Treatment regimen comprising of topical compounds (ear cleanser) and systemic drugs (antibacterial and antifungal) were found to be more efficacious along with supportive treatments in resolving canine otitis. Based on the results, it can be concluded that the canine ear infections can be managed with ear cleaners followed by the antibacterial and antifungal drugs with supportive treatments. However,

extensive studies on the same line involving more number of observations are required to draw valid conclusions.

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