



**CLINICO – MICROBIOLOGICAL AND THERAPEUTIC STUDIES
ON CANINE OTITIS EXTERNA****

K. LAKSHMI *1 AND D. S. TIRUMALA RAO 2

*Department of Veterinary Medicine, College of Veterinary Science (SVVU),
Rajendranagar, Hyderabad, India-500030.*

ABSTRACT

The study was conducted on 48 clinical cases of dogs with the objective of recording clinical signs, identifying etiological agents and therapeutic management of otitis in dogs. Various clinical signs of otitis were aural pruritus, ear pain, foul odour of ear discharge, head tilt, erythema of pinna, alopecia, scaling, crusting of pinna and swelling at the base of the ear canal. Otoscopic examination of the affected ear of 48 dogs revealed erythema of ear canal, and exudates that were yellowish purulent, brownish and black thick discharge. The result of the cultural examination of discharges revealed growth of bacteria viz *Staphylococcus aureus*, *Streptococcus spp*, *Pseudomonas aeruginosa*, *E.coli* and *Proteus spp*. Apart from bacteria, fungal isolates like *Aspergillus spp* and *Malassezia pachydermatitis* yeast were identified. The antibiotic sensitivity test showed highest sensitivity towards Ciprofloxacin. The invitro disc diffusion test using antifungal discs showed the highest sensitivity towards Ketoconazole. The therapeutic response in treating otitis with Ciprofloxacin topical and oral was more effective than ofloxacin topical and oral preparations. Similarly, a combination of Ketoconazole orally & Ciprofloxacin topically was more effective than the combination of Clotrimazole topically and Ofloxacin orally.

KEY WORDS: Canine, otitis, clinical signs, causative organisms, treatment.



K. LAKSHMI

Department of Veterinary Medicine, College of Veterinary Science (SVVU),
Rajendranagar, Hyderabad, India-500030.

*Corresponding author

INTRODUCTION

Diseases of the external ear are commonly encountered in dogs and are among the most frustrating in diagnostic and therapeutic point of view to practicing veterinarians. In the absence of detail observations, diagnostic tools, most of the canine practitioners, frequently initiate treatment of otitis prior or even without sensitivity testing⁶. Otitis can cause considerable pain, distress and discomfort to the affected dog. The difficulty in treating otitis is due to the complexity and multiple etiological agents and emergence of drug resistance¹⁵. The etiological components for auricular disorders are vast and involve several factors and its identification may be the key for formulating successful therapy¹. Relapse or recurrence of ear infection is often noticed in otitic dogs even with symptomatic treatment. The Conventional approach to otitis involves cleaning the ear with cotton wool and hydrogen peroxide and instillation of ear drops over the next few days. A somewhat more conscientious approach will involve the use of topical and or systemic antibiotics based on the antibiogram²⁰.

MATERIALS AND METHODS

Forty eight clinical cases of canine otitis, presented at Veterinary Hospital Bhoiguda and campus veterinary Hospital, College of Veterinary science, Rajendranagar, with the signs of head tilting, shaking of ears, foul odour of ear discharge, ear scratching, erythema of pinna, dropping of the affected ear, formed the basis for the present investigation. Further a detailed clinical examination of the affected ear was carried out by employing otoscope in each case of otitis. More over number of ears affected (unilateral/ bilateral) and confirmation of the affected ear was studied. The ear swabs were collected from the otitic ears and then subjected for two different cultural procedures i.e. for bacteria and fungi to isolate and determine the etiology of otitis.

Isolation of bacteria

Samples cultured in Nutrient broth were streaked using the sterile loop on the selective media and incubated at 37 °C for 24 hours. The plates were examined for colony morphology and Gram's staining was performed to identify the bacteria upto genus level as per the standard methods listed in the Bergy's manual of determinative bacteriology⁴.

Isolation of fungus

The swabs collected were transferred into the Sabouraud's dextrose broth containing chloramphenicol at rate of 0.05 mg/ml of medicine and incubated at 37°C for 24-48 hours. The broth culture was streaked onto the Sabouraud's dextrose agar and was incubated at 30 °C for 1 to 7 days. The plates were daily examined for fungal growth. The drug sensitivity was performed on the mixed culture isolates using disc diffusion method⁷. For treatment purpose, 48 clinical cases of otitis were randomly divided into 4 groups (viz group 1, 2, 3,4) with 12 animals in each group and treatment was carried out for 7 days as given below and prior to treatment, the infected ears were cleaned with hydrogen peroxide. Group I dogs were treated both topically as well as orally with Ciprofloxacin (Ciplox Ear drops^a) 5-6 drops in each ear followed by tablet Ciptas-L^b (250mg) given orally. Group II dogs were treated both topically and orally with Ofloxacin (I Fax-D Eye / Ear drops^c) 5 - 6 drops in each ear followed by tablet Oflomil^d(400 mg). Group III dogs were treated with a combination of topical Ciprofloxacin and Ketoconazole orally. Ciplox ear drops 5-6 drops in each ear followed by tablet Nizral 200mg^e (5mg /kg). Group IV dogs were treated with a combination of topical Clotrimazole and Ofloxacin orally candid ear drops^f 5-6 drops in each ear followed by tablet Oflomil (400mg). Therapeutic efficacy was assessed based on start of alleviation of clinical signs and the time taken for complete recovery. Statistical analysis of the data was carried out as per the procedures described²². Chi-square

test x2 was employed to study the therapeutic efficacy of different drugs .

a. **Ciplox Ear drops**-A proprietary product of Cipla Ltd., Bombay Containing Ciprofloxacin 0.3%, Benzylkonium chloride 0.01% aqueous vehicle.

b. **Tab Ciptas-L**. A proprietary product of Intas Ltd. Ahmadabad. Containing Ciprofloxacin 250 mg, lactobacillus sporogenes 20 million CFU

c. **I -fax – D- Eye/Ear drops** – A proprietary product of qualilat, Chandigarh containing Ofloxacin dexamethasone HPMC Ophthalmic solution (10ml)

d. **Tab Ofloamil**– A proprietary product of Glen mark Pharmaceuticals Himachal Pradesh . Containing Ofloxacin 400mg.

e. **Tab Nizral** – A Proprietary product of Johnson & Johnson containing Ketoconazole 200 mg.

f. **Candid Ear drops** – A Proprietary product of Glen mark containing Clotrimazole 1% W/V, Lignocaine Hcl .2% W/V.

RESULTS AND DISCUSSION

In the present study, all the 48 dogs (100%) had a history of ear scratching, 36 dogs (75%) had head tilt, 28 dogs (58.33%) had ear dropping, and 14 dogs (29.16%) had inappetence. Clinical signs recorded were aural pruritus revealed in all the 48 dogs (100%) which was exhibited by ear scratching, 39 dogs (81.25%) had evinced ear pain, 32 dogs (87.5%) showed ear shaking, 28 dogs (58.33%) had foul odour of ear discharge, 12 dogs (25%) had head tilt and 8 dogs (16.66%) had erythema of pinna, 6 dogs (12.5%) had alopecia, scaling and crusting of pinna, 2 dogs (4.16%) had swelling at the base of the ear. Erythema, pain ,discharge, foul odour, loss of appetite, head tilting shaking of the ear, ulceration and bleeding were recorded¹⁰. Head shaking, pruritus and drooping of the ear were characteristic clinical signs observed in all cases of otitis¹³. Otoscopic examination of the affected ears revealed erythema of ear canal in 25 dogs, (52. 0%). Exudates was observed in 23 dogs (47.91%) which was varied in colour .Of which yellowish purulent discharge

in 12 dogs (25%) followed by brown exudate in 8 dogs (16.66%) and black , thick discharge in 3 dogs (6.25%). Among the 48 dogs, 28 (58.33%) dogs had unilateral ear infection, while 20 (41.66%) had bilateral infection 13. Otoscopic examination was carried out and which revealed erythema of ear canal, ulceration , congestion at ventral aspect of vertical ear canal and exudates of varied colours.

Of the 48 dogs observed with otitis, 22 (45.63%) dogs had dropped or pendulous ears, 14 (29.16%) dogs had semi erect ears and 12 (25%) dogs had erect ears .Similar observations were recorded⁸ However, The dogs with erect ears had higher occurrence of otitis⁵. Insufficient ventilation, absorption and evaporation of moisture may lead to maceration of the ear canal epithelium and subsequently may predispose to otitis in dogs having pendulous or drooling ears² . Ambient temperature and blood supply will make tortuous ear canal an ideal environment for the growth of bacteria and fungus, thus precipitating in copious discharges and subsequent occurrence of clinical signs¹². Bacterial isolates of 48 ear samples revealed that 36 cases (75%), had *Staphylococcus aureus* , 28 cases (58.33%) had *Streptococcus spp*, 14 cases (29.16%) had *Pseudomonas aeruginosa*, 8 cases (16.66%) had *E.Coli* and 3 cases (6.25%) had *Proteus spp*.. Microbiological study revealed that bacterial otitis externa was more common and showed the presence of *Staphylococcus*, *Micrococcus*, *Streptococcus*, *Pseudomonas*, *Corynebacterium*, , *E.Coli*¹¹. Among the 48 clinical cases of otitis, 12 (25%) isolates belonged to *Malassezia pachydermatitis*, 8 (16.66%) isolates belonged to *Aspergillus spp*. *Malassezia pachydermatitis* has been isolated from normal ear canal and also in dogs with otitis externa¹⁷. The *Malassezia* organism has been found associated with 72% of otitis cases in dogs³. *Malassezia pachydermatitis*, *Aspergillus spp* and *candida spp* were isolated from dogs suffering with otitis.²¹

All the samples that were collected from 48 dogs were subjected to invitro drug sensitivity using 8 different antibiotics. Ciprofloxacin

showed highest sensitivity (91.7%); followed by Ofloxacin (79.1%), Gentamicin (70.8%), Enrofloxacin (58.3%), Chloramphenical (52%), Cephataxime (43.7%); Amoxicillin clavulanic acid (27%) and Tetracycline (20.8%). The sensitivity of microorganisms to a new generation of antibiotics viz Ciprofloxacin, Norfloxacin and Enrofloxacin was observed to be higher suggesting their better efficacy for treatment in canine otitic cases⁶. Antibioqram in canine otitis revealed highest sensitivity to Ciprofloxacin and Gentamicin¹⁶. The invitro disc diffusion test, done on 48 dog samples showed that the isolates were found highly sensitive to Ketoconazole (62.5%) followed by Clotrimazole (50%), Amphoterin B (37.5%) and Nystatin (25.1%). Similar results were recorded¹⁹. Highest sensitivity was exhibited by Fluconazole followed by Ketoconazole and Itraconazole¹⁸. Dogs in group I were treated with ciprofloxacin topical and oral, in which 11 dogs (91.6%) responded and became normal. In group II 8 dogs (66.61%) were cured with Ofloxacin topical and oral. Ciprofloxacin was highly efficacious when compared to Ofloxacin. (Table 1). Ciprofloxacin was the drug of choice in successful treatment of otitis¹⁴. Employing a combination of Ciprofloxacin, Gentamicin, and an Azole group of antifungals in treatment of

otitis yielded good results¹⁰. Ciprofloxacin, Enrofloxacin, Norfloxacin were efficacious in treating otitis.⁶ Ciprofloxacin was the first ideal choice of antibiotic in the treatment of otitis in dogs¹³. However, Gentamicin, Chloramphenical and Ampicillin were the choice of antibiotics in treating canine otitis⁹.

Similarly, In group III, 10 dogs were cured (83.3%) with a combination of oral ketoconazole and Ciprofloxacin topical while in group IV, 8 dogs were cured (66.6%) with a combination of Clotrimazole topical and oral Enrofloxacin, thus therapy given to group III was more efficacious than given to dogs in group IV. Ketoconazole preparations in the form of oral and topical administration yielded good results in treating otitis. On the contrary, a combination containing Clotrimazole, Betamethasone and Ciprofloxacin was effective in treating canine otitis¹⁵. The present clinical study indicated that Ciprofloxacin (topical and oral) could bring almost total clinical recovery on day 3 in group I whereas combination of Ketoconazole and Ciprofloxacin brought complete clinical recovery on day 5 in group III dogs. Whereas therapeutic combination in group II and IV dogs was less effective and the symptoms continued till day 7 thus giving less response.

Table 1
Statistical analysis and Therapeutic efficacy of different drugs.

Group	Treatment	No. of Dogs		Percent Response
		Treated	cured	
I	Ciprofloxacin topical and oral	12	11*	91.6%
II	Ofloxacin topical and oral	12	8*	66.6%
III	Ketoconazole oral and Ciprofloxacin topical	12	10*	83.3%
IV	Clotrimazole topical and Ofloxacin oral	12	8*	66.6%

* = Significant

X^2 table value at 1 degree of freedom and 5% level of significance is 3.84. Since the X^2 calculated values are less than table value; all the 4 groups are significant. Based on chi-square test, all the 4 groups were statistically significant.

CONCLUSION

Employing Ciprofloxacin as topical and oral form was the ideal therapeutic tool in dealing with cases of otitis in dogs.

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