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## Therapeutic study on canine otitis in Guwahati, Assam

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#### Abstract

The present study entitled “Therapeutic Study on Canine Otitis in Guwahati, Assam” was undertaken to formulate an effective therapeutic regimen against otitis. In the study, dogs with otitis were divided into 3 therapeutic trial groups consisting of 18 animals each and further each group were divided into 3 different sub-groups consisting 6 animals in each. Each group was subjected to different antibiotic and supportive treatment based on the *in-vitro* antibiotic sensitivity test. Response to the treatment was evaluated based on clinical improvement. It was observed that Enrofloxacin ear drop alone showed highest clinical improvement followed by Ciprofloxacin and Gentamicin. Combination of Ofloxacin ear drop, systemic administration of Ceftriaxone & tazobactam and oral administration of Itraconazole brought earliest clinical recovery.

**Keywords:** otitis, therapeutic regimen, antibiotic, antifungal

#### Introduction

Inflammation of different parts of the ear is generally termed as otitis. According to involvement of different parts of ear, it is classified as otitis externa, otitis media and otitis interna. Inflammation of epithelium and lining of the external auditory canal is termed as otitis externa. Otitis media is the inflammation of the middle ear and seen in all animals, more commonly on dogs and cats. Usually otitis interna refers to a group of inflammatory conditions of the external ear. Mostly it is associated with otitis interna and media.

The therapeutic management is usually difficult in otitis due to involvement of multiple etiological agents and emergence of drug resistance (Kumar *et al.*, 2002) [4]. As a result, relapse or recurrence of ear infection is often noticed in otitic dogs even after symptomatic treatment. Treatment of acute reversible condition symptomatically may lead to irreversible chronic stage which does not have any permanent treatment (Devaya, 1993) [2]. The present study was aimed to formulate an effective therapeutic regimen against otitis by using different antibiotic and antifungal preparation.

#### Materials and Method

The present study was conducted in Veterinary Clinical Complex (VCC), College of Veterinary Science, Assam Agricultural University, Khanapara. In the study, dogs with otitis were divided into 3 therapeutic trial groups consisting of 18 animals each and further each group were divided into 3 different sub-groups consisting 6 animals in each sub-group. Each group was subjected to different antibiotic and supportive treatment based on the *in-vitro* antibiotic sensitivity test. Response to the treatment was evaluated based on clinical improvement. The dogs were evaluated on 0<sup>th</sup> day, 14<sup>th</sup> day, 21<sup>st</sup> day and 28<sup>th</sup> day. Therapeutic trial was conducted for 28 days and clinical recovery was observed in majority of the cases within 28 days as documented by Reddy (2014) [6].

**Table 1:** Grouping of animals for therapeutic management

Group	Sub Group	Antibiotic (Topical)	Antibiotic (systemic)	Antifungal (systemic)
Group 1	Sub Group 1a	Enrofloxacin ear drop 8 drops thrice daily on the affected ear till recovery	-	-
	Sub Group 1b	Enrofloxacin ear drop 8 drops thrice daily on the affected ear till recovery	Enrofloxacin @ 10mg/kg body weight i/m or P.O. daily initially for 7 days, if not recovered extended till 14 days	-
	Sub Group 1c	Enrofloxacin ear drop 8 drops thrice daily on the affected ear till recovery	Enrofloxacin @ 10mg/kg body weight i/m or P.O. daily initially for 7 days, if not recovered extended till 14 days	Itraconazole @ 10mg/kg body weight orally daily for 28 days
Group 2	Sub Group 2a	Ofloxacin ear drop 8 drops thrice daily on the affected ear till recovery	-	-
	Sub Group 2b	Ofloxacin ear drop 8 drops thrice daily on the affected ear till recovery	Ceftriaxone & tazobactam @ 15mg/kg, body weight daily i/v initially for 7 days, if not recovered extended till 14 days	-
	Sub Group 2c	Ofloxacin ear drop 8 drops thrice daily on the affected ear till recovery	Ceftriaxone & tazobactam @ 15mg/kg, body weight daily i/v initially for 7 days, if not recovered extended till 14 days	Itraconazole @ 10mg/kg body weight orally daily for 28 days
Group 3	Sub Group 3a	Gentamicin ear drop 8 drops thrice daily on the affected ear till recovery	-	-
	Sub Group 3b	Gentamicin ear drop 8 drops thrice daily on the affected ear till recovery	Gentamicin @ 5mg/kg, body weight daily i/m initially for 7 days, if not recovered extended till 14 days	-
	Sub Group 3c	Gentamicin ear drop 8 drops thrice daily on the affected ear till recovery	Gentamicin @ 5mg/kg, body weight daily i/m initially for 7 days, if not recovered extended till 14 days	Itraconazole @ 10mg/kg body weight orally daily for 28 days

### Supportive Therapy

Supportive therapy was administered based on the requirement of the affected animals. In the present study used supportive therapies were as follows-

1. Vitamin A and Liver supportive as per the dose rates recommended by the manufacturer.
2. Prednisolone @ 1mg/kg body weight.
3. Meloxicam @ 0.3 mg/kg body weight.
4. Cetirizine hydrochloride @ 1mg/kg body weight.

### Therapy for associated condition

Flea allergic dermatitis was treated with external application of fipronil as spot on once in a month for three occasion and Cetirizine hydrochloride tablet @1mg/kg body weight orally daily for 5-7 days depending upon the conditions.

Demodicosis associated with otitis was treated with ivermectin @ 300 µg /kg body weight orally daily (Horne, 2010) [3] and topical application of 0.05% amitraz till the skin scraping proved negative for mites. In some cases of puppies below 6 months and above 7 weeks, imidacloprid 10% & moxidectin 2.5% as spot on were used as alternative to ivermectin (Horne, 2010) [3]. Scabies associated otitis were treated with ivermectin @ 200 µg/kg body weight P.O twice weekly till the skin scraping proved negative for mites.

Fungal infection associated with otitis was treated with itraconazole @10mg/kg b/wt or ketoconazole @ 5-10mg /kg body weight /day orally until attainment of clinical normalcy. Topical application of miconazole in ointment and shampoo form was also used along with parenteral antifungal therapy.

### Results and Discussion

The post treatment evaluation of symptoms was carried out at every week interval for a period of 1 month. On the basis of in-vitro drug sensitivity test, four antibiotics and two antifungal agents were selected for the treatment of otitis. Overall stage of recovery in dogs of various groups and sub-groups suffered from otitis at different weeks of treatment is presented in the table 2.

The disappearance of clinical signs and complete clinical recovery in all the dogs was observed within 14 days in the sub-group 2c (Ofloxacin ear drop + Ceftriaxone & tazobactam parenteral + Itraconazole oral), within 21<sup>st</sup> day in the sub-group 1c (Enrofloxacin ear drop + Enrofloxacin parenteral + Itraconazole oral) and sub-group 2b (Ofloxacin ear drop + Ceftriaxone & tazobactam parenteral). Finally, within 28<sup>th</sup> day

post treatment all the other sub-groups i.e. sub-group 1a (Enrofloxacin ear drop); sub-group 1b (Enrofloxacin ear drop + Enrofloxacin parenteral); sub-group 2a (Ofloxacin ear drop); sub-group 2b (Gentamicin ear drop + Gentamicin parenteral) and sub-group 3c (Gentamicin ear drop + Gentamicin parenteral + Itraconazole oral) recovered except sub-group 3a (Gentamicin ear drop) where 2 otitic dogs persisted their clinical signs till 28<sup>th</sup> day.

In the present study sub group 1a, 1b, 1c, 2a, 2b, 2c, 3b and 3c could bring almost total clinical recovery, whereas combination of Ofloxacin, Ceftriaxone & tazobactam and Itraconazole (sub-group 2c) brought complete clinical recovery within 14 days. The faster therapeutic response in the sub-group 2c might be due to administration of two different antibiotics concurrently, where combination of Ofloxacin and Ceftriaxone & tazobactam might potentiate the effect. Therapeutic combination of the otitic dogs belongs to group 3 took more time i.e. 28<sup>th</sup> day for disappearance of the clinical signs and where in sub-group 3a symptoms were continued in 2 dogs for extended period beyond 28<sup>th</sup> days.

For successful treatment of otitis, reducing pruritus, swelling, exudation and tissue proliferation should be the key goal of therapy along with maintenance treatment for the subsequent infections. In the present study, corticosteroid (Prednisolone) was used as supportive therapy in order to soothen the intensity of pruritus and to reduce the inflammation. The result was favorable and corroborate with Bensignor and Grandemange (2006) [1]. They documented that Prednisolone has anti-inflammatory, anti-proliferative and anti-pruritic actions. Hence it could be used to control inflammation and pathogenic changes in the ear canal which is usually associated with otitis externa. Further, Prednisolone could also be used for the treatment of primary disease like atopic dermatitis that triggered the otitis. Kumar *et al.* (2002) [4] observed that proper cleaning of the ear canal play an important role in quick healing of otitis externa. The author suggested that accumulation of wax and other debris interferes with physical contact of specific medications with the affected tissue. Further, they also mentioned that combination Clotrimazole, Betamethasone and Ciprofloxacin therapy was an effective regimen for *Malassezia* otitis. Merchant (1997) [5] emphasized that most of the otitis cases require daily cleaning and application of topical medications. He also narrated that; the cases which didn't respond to topical medications alone must be concomitantly treated with

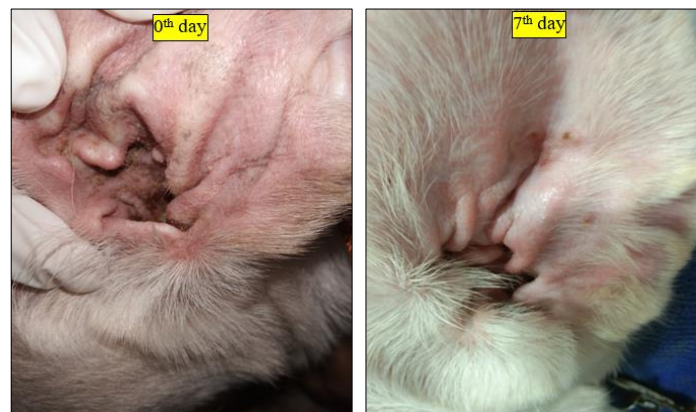
systemic antimicrobial and antifungal therapy.

From the above study it can be concluded that dogs treated with Enrofloxacin ear drop alone showed highest clinical improvement followed by Ofloxacin and Gentamicin.

Combined therapy using Ofloxacin ear drop, parenteral Ceftriaxone & tazobactam and oral preparation of Itraconazole showed faster recovery in the treatment of otitis in dog.

**Table 2:** Variations in clinical improvement (%) in different treatment groups in otitis

Group	Sub Group	7 <sup>th</sup> day	14 <sup>th</sup> day	21 <sup>st</sup> day	28 <sup>th</sup> day
Group 1	Sub Group 1a (n=6)	-	-	4 (66.67%)	2 (33.33%)
	Sub Group 1b (n=6)	-	2 (33.33%)	3 (50.00%)	1 (16.67%)
	Sub Group 1c (n=6)	1 (16.67%)	3 (50.00%)	2 (33.33%)	-
Group 2	Sub Group 2a (n=6)	-	-	3 (50.00%)	3 (50.00%)
	Sub Group 2b (n=6)	2 (33.33%)	3 (50.00%)	1 (16.67%)	-
	Sub Group 2c (n=6)	2 (33.33%)	4 (66.67%)	-	-
Group 3	Sub Group 3a (n=6)	-	-	2 (33.33%)	2 (33.33%)
	Sub Group 3b (n=6)	-	1 (16.67%)	2 (33.33%)	3 (50.00%)
	Sub Group 3c (n=6)	-	2 (33.33%)	3 (50.00%)	1 (16.67%)



**Fig 1:** Photographs showing recovery during pre-treatment and post-treatment period (Using Ofloxacin Ear Drop, Parenterally Ceftriaxone & Tazobactam)



**Fig 2:** Photographs showing recovery during pre-treatment and post-treatment period (using enrofloxacin ear drop, Parenterally enrofloxacin and Itraconazole)

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