



A Study on Microbial Profile and Trend in Antimicrobial Susceptibility of Canine Otitis

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Abstract

A total of 240 ear swabs collected aseptically from 213 dogs affected with otitis externa and presented at Madras Veterinary College Teaching Hospital during the years 2011-2014 were utilized for the study. The ear swabs were cultured to know the prevalence of microorganisms causing otitis and to evaluate the sensitivity pattern of antimicrobial drugs for the management of otitis in dogs. *Pseudomonas spp* was found to be the predominant microorganism affecting canine otitis. Highest rate of sensitivity was observed with Cefotaxime.

Key words: Canine, Otitis, Microbial profile, Antibigram

Introduction

Canine otitis is inflammation of ears 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. The pathologic condition is also predisposed by various factors such as the anatomical changes in the ear like stenosis of the ear canal, pendulous ears, presence of foreign bodies, injury to ears, moisture retention in the ears etc. Otitis causes itching and redness in the ears as well as pain, which makes the animal to groan and when the condition is not properly managed, it often results in a ruptured ear drum and deafness. Further, ear infections are among the ten most frequent reasons for dogs to be presented to veterinarians and may affect up to 20% of dog population (Senthil, *et al.* 2010). Hence a study was conducted with the objective to know the prevalence of microorganisms causing otitis and to evaluate the sensitivity pattern of these microbes to the commonly used antimicrobial drugs used for the management of otitis in dogs.

Materials and Methods



A total of 240 ear swabs from 213 dogs affected with otitis externa and presented at Madras Veterinary College Teaching Hospital during the years 2011 to 2014 were utilized for the study. The ear secretions were collected using sterile cotton swabs.

The dogs selected for the study were of both genders, from different breeds and from 6 months to 14 years old, all with clinical signs specific for otitis externa. The data such as age, breed, sex of the dogs suffering from otitis were recorded. The ear swabs were cultured, to know the prevalence of microorganisms causing otitis and to evaluate the sensitivity pattern of antimicrobial drugs for the management of otitis in dogs.

The in vitro antibiotic sensitivity patterns of the microorganisms isolated were carried out by agar disc diffusion method (Bauer et al., 1966). For bacterial isolation and identification the samples were cultivated on blood agar and also on McConkey agar. Cultures were incubated aerobically for 24-48 hours at 37°C. Bacterial colonies were identified based on morphological and various biochemical tests. (Quinn et al., 1994).

Results and Discussion

The canines suffering from otitis were recorded from different age groups, different breeds and of both sexes. The patients were presented with one or many of the following signs like pruritis of the ear, head shaking, unilateral or bilateral dropping of ears, increased amount of ear discharge and malodour (bad smell) from the ear.

Age predisposition

Highest number of otitis cases 64 (31.46%) were recorded in the age group between 5-10 years. 44 (20.66%) animals were in age group of 1-3 year, 52 (24.41%) animals in age group of 3 to 5 years, 13 (6.10%) animals were in the age group of 10-13 years and 26 (11.74%) animals were more than 13 years old. A low incidence 14 (5.63%) was observed in dogs aged less than one year. (Table 1). This observation is comparable with the findings of Fraser *et al.* (1970) who reported the peak incidence of otitis externa in four year old dogs and a lower incidence in animals less than one year old.

Table 1: Agewise Predisposition to Canine Otitis

Age Group (Years)	No. of cases	Percent of cases
Less than 1 year	14	5.63
1 – 3 years	44	20.66
3-5 years	52	24.41
5-10 years	64	31.46
10-13 years	13	6.10
More than 13 years	26	11.74

Breed predisposition



Out of a total 213 cases studied, Labrador breed of dogs 54 (25.35%) had highest predisposition. This was followed by 41 Non-descript dogs (19.25%), 32 Spitz (15.02%), 30 German Shepherd dogs (14.08%), 21 Pug (9.86%), 19 Dachshund (8.92%), 8 Golden Retriever (3.76%), 4 Rottweiler (1.88%), 2 Cocker Spaniel (0.94%) and 2 Boxer (0.94%).(Table 2). However Senthil *et al.* (2010) stated that long eared breeds suffered more with otitis.

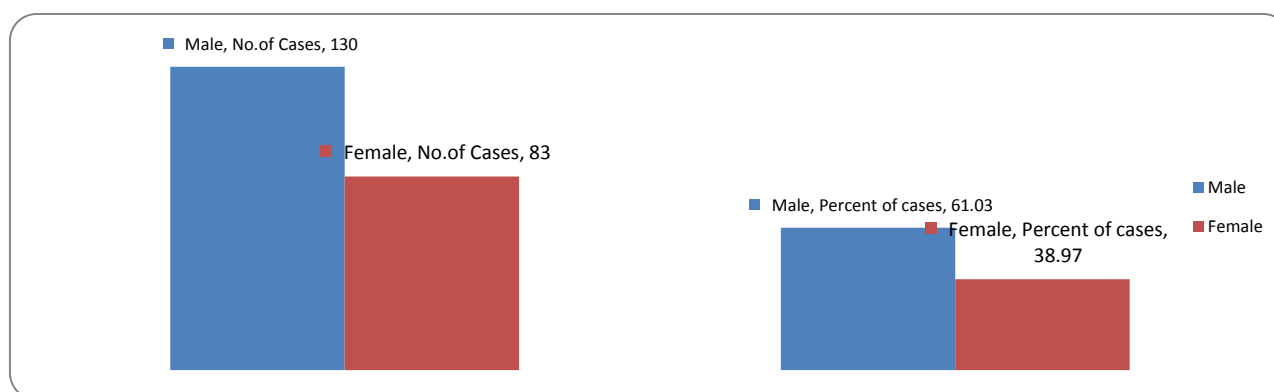
Table 2: Breed Wise Predisposition to Canine Otitis

Breed	No. of cases	Percentage
Labrador	54	25.35
Non-descript	41	19.25
Spitz	32	15.02
German Shepherd	30	14.08
Pug	21	9.86
Dachshund	19	8.92
Golden Retriever	8	3.76
Rottweiler	4	1.88
Cocker Spaniel	2	0.94
Boxer	2	0.94

Sex predisposition

About 130, (61.03%) of dogs affected with otitis were males (Figure 1) and 83 (38.97%) were females. The increased number of otitis cases in males in this study could be attributed to the fact that most of the pet population in and around Chennai is males.

Figure 1: Sex Wise Predisposition to Canine Otitis



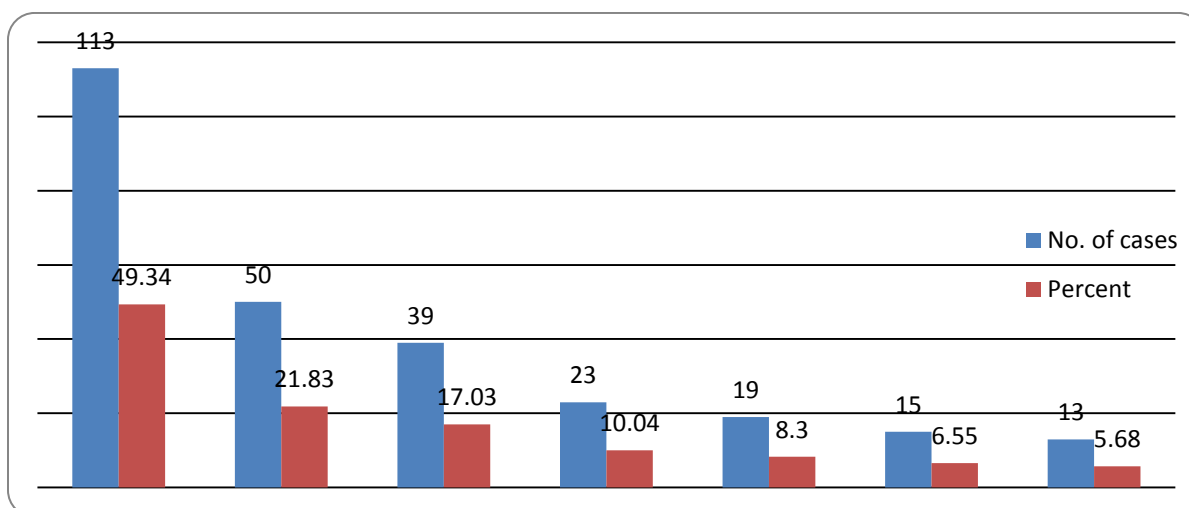
Microbial profile in canine otitis

Of the 240 ear swabs cultured from 213 dogs, bacterial and fungal growth was identified in 229 ear swabs (95.42%). 172 cases were of mono-microbial infections and 57 cases were of poly-microbial infections.



Out of the samples studied, 113 isolates (49.34%) had shown *Pseudomonas spp* as the causative agent. This was followed by 50 isolates of *Staphylococcus spp* (21.83%), 39 isolates of *E.coli* (17.03%), 23 isolates of *Streptococcus spp* (10.04%), 19 isolates of *Bacillus spp* (8.30%), 15 isolates of *Proteus spp* (6.55%) and 13 isolates of *Klebsiella spp* (5.68%) (Figure 2).

Figure 2: Microbial Profile of Canine Otitis

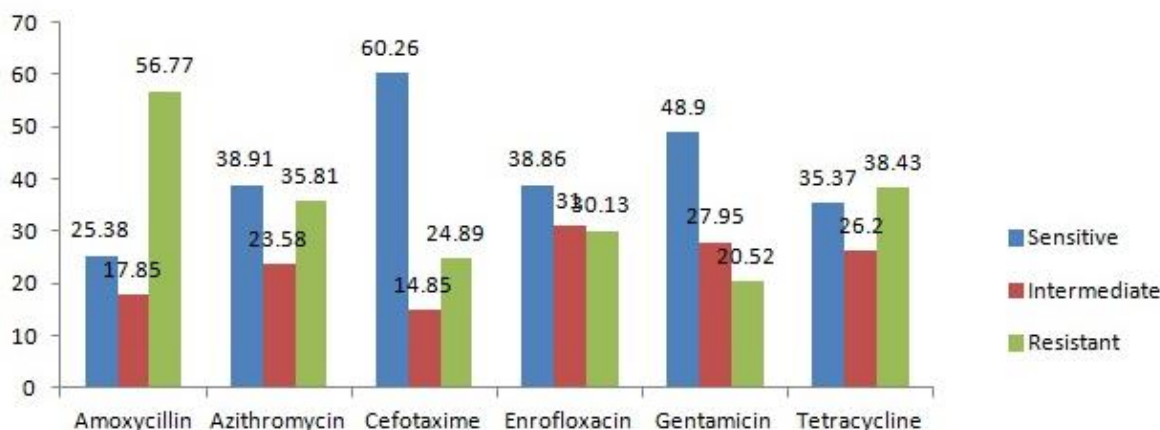


The high prevalence of infectivity with *Pseudomonas sp* found in chronic otitis externa cases in this study was in accordance with the report of Vikas *et al.*, (2003) who reported that 40% of dogs with otitis had infection with *Pseudomonas sp* in their study. However, Kumar and Sharma (2002) observed *Staphylococcus spp* followed by *Pseudomonas aeruginosa*, *Proteus spp* and *Streptococcus spp* in decreasing order of prevalence in canine otitis cases. The findings of Kiss, *et al.* (1997) for *Staphylococci* and *Pseudomonas spp* were 39.22 % and 12.62 % respectively.

Antimicrobial sensitivity pattern in canine otitis

Highest rate of sensitivity was observed with Cefotaxime in 138 cases (60.26%), followed by Gentamicin in 118 cases (48.9%), Azithromycin in 93 cases (38.91%), Enrofloxacin in 89 cases (38.86%), Tetracycline in 81 cases (35.37%) and Amoxicillin in 54 cases (25.38%). Highest numbers of cases (130) were resistant to Amoxicillin (56.77%) (Figure 3).

The observation of high rate of resistance to amoxycillin in this study concurred with observation of Vikas *et al.*, (2003) and Jones *et al.* (2000) who have also reported a high rate of resistance to amoxycillin by otitic pathogens. Kumar Vikas *et al.* (2003) and Senthil *et al.* (2010) recorded high sensitivity to Ciprofloxacin.

**Figure 3: Antimicrobial Sensitivity Pattern in Canine Otitis****Sensitive pattern of individual bacterial genus isolates to antibiotics**

Out of 113 *Pseudomonas* spp studied, highest rate of sensitivity was observed to Cefotaxime in 74 cases (65.49%). *Staphylococcus* spp had shown highest sensitivity to Gentamicin in 30 cases (60%) out of the 50 cases studied. *E.coli* had shown highest sensitivity to Enrofloxacin in 18 cases (46.15%) out of the 39 cases studied.

Streptococcus spp had shown highest sensitivity to Cefotaxime in 17 cases (73.91%) out of the 23 cases studied. *Bacillus* spp had shown highest sensitivity to Azithromycin in 12 (63.16%) out of the 19 cases studied. *Proteus* spp had shown highest sensitivity to Enrofloxacin in 9 (60%) out of the 15 isolates and *Klebsiella* spp showed sensitivity to Azithromycin in 8 (61.54%) out of the 13 isolates studied.

Conclusion

To conclude, the study revealed that middle aged dogs of various breeds of both sexes were affected with otitis. *Pseudomonas* spp was predominant organism in this study. The *in vitro* sensitivity of the bacterial isolates indicated highest sensitivity to Cefotaxime followed by Gentamicin, Azithromycin, Enrofloxacin, Tetracycline and Amoxicillin. Prompt and successful treatment of the condition therefore warrants a rational therapy with antibiotics based on the results of cultural isolation and antibiogram tests.

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