MICROBIAL EVALUATION AND MANAGEMENT OF OTITIS EXTERNA IN DOGS

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The study was conducted to record the microbial inhabitants of the nirmal ear canal and isolate microbial infective agents in otitic ears in dogs. The microorganisms were isolated from 87.5% of normal ears, which included *Staphylococcus* spp. (37.5%) followed by *S. pyogenes* (25.0%), *P. aeruginosa* (12.5%) and *E. coli* (12.5%). The fungus *Candida* spp was isolated from 37.5% normal ears, which was always present along with *Staphylococcus* (25%) and *Pseudomonas* (12.5%). All the eight ears with otitis were positive for bacteria or bacteria along with fungal infection. *S. intermedius* (37.5%) was the most common followed by *Pseudomonas aeruginosa* (25.00%). Bacteria *S. pyogenes, K. pneumonae* and *Proteus morganii* were present in 12.5% cases each. The fungi isolated from otitic ears were *Candida* spp. (62.5% of cases) and *Trichosporon* spp. (12.5% cases). The fungi were always present in association with bacteria in otitic cases. The drug for treatment of such cases should contain an antifungal ingredient, an antibacterial component active against *Streptococcus* and *P. aeruginosa,* antipruritic and antiinflammatory component.

Key words: Dog Otitis, Bacterial inhabitants, fungal infection.

Introduction

Otitis externa is an inflammation of the external ear canal with an underlying reason for the infection and inflammation, resulting in varying degree of erythema (of pinna, external meatus and lining of the external ear canal), head shaking, ear scratching, otic discharge (Ceruminous or Purulent), excoriations, malodour, swelling and pain. In chronic cases external ear canal becomes stonotic, occluded with hyperplastic changes of soft tissues surrounding the canal.

The condition appears to result from a combination of dynamic changes that affect the anatomic, physiologic and microbiologic status of the external acoustic meatus (August, 1988). A higher prevalence of otitis externa in certain breeds suggests that certain aural characteristics (pendulous ear) may predispose specific breeds to this disease (Hayes *et al.,* 1987). Other factors that may predispose the animal for otitis include parasites (Griffin, 1981), allergic diseases (Muller *et al.*,1989), pyodermas (Carlotti *et al.* ,1988), autoimmune skin diseases (Rosser, 2004) and more commonly bacterial infection (Scott *et al.*, 2001; Hariharan *et al.,* 2006). The present study was conducted to record the presence of bacterial and fungal infection in cases of otitis externa in dogs and suggest the line of treatment.

Materials and Methods

The present study was conducted on 8 clinical cases of dogs reported with the signs of otitis externa. All the animals were subjected to clinical examination to confirm otitis externa. Age, sex and breed of the affected animal were recorded in each case. Swab samples were collected using sterilized hiculture collection device (VS) PW044 (Himedia Laboratories Pvt. Limited, Mumbai) which were stored immediately in sterile test tubes. In all the cases of otitis the samples were collected on day 0 (before commencement of treatment on the day of presentation of the case), and then on days 3, 7 and 15 after the initiation of the treatment. The control samples were taken from the healthy ear of the same animal on day 0.

Processing of the sample

These swabs were moistened in sterile nutrient broth in sterile test tubes and later on were inocualted onto blood/nutrient agar and MacConkey's agar plates and were incubated at 37^{o}C till the growth appeared. Further processing for purification and typing of bacteria and identification of fungal organismwas done as per standard procedures (Carter *et al.*, 1995).

Antibiotic Sensitivity Test:

Antibiotic sensitivity test was done in order to study the sensitivity pattern of the microorganisms isolated from the affected cases to routienly used antibiotics. A recommended agar diffusion procedure called as Kirby Bauer method was used for testing cultures for antibiotic sensitivity (Bauer *et al.*, 1996). Discs of those antimicrobial agents for which preparations are commonly avaialble in

the market and are also used for local and parenteral administration were preferred.

Management of Otitis

Otitic cases were first cleaned daily with normal saline solution and in some severe cases with 1% H2O2. The topical otic preparation was selected on the basis of antibiotic sensitivity results of the Ear Swab. The otic preparation having sensitive antibiotic and antifungal agent Ketoconazole were used until resolution of clinical signs like pruritis/exudation and negative culture examination. In some cases the systemic antibotic therapy was also adopted. The antibiotic selected was based on the antibiograms of the otitic ear. In addition of this treatment meloxicam tab (Tab- M.cam)* was given @ 0.2 mg/kg body weight orally so as to reduce pruritis, pain and inflammatory reaction.

Results and discussion

A total of 8 cases of otitis externa were included in study initially. However, 2 animals had to be discontinued because of unavailability of postoperative follow ups. Out of the 8 dogs, 50% were German Shepard dogs and 25% were spitz and rest were non-descript breeds. The age of the affected animals ranged from 2-7 years. Male dog constituted 75% of the cases of otitis and remaining 25% were female. All the cases had unilateral problem. The duration of otitis varied from 2-6 days. All the dogs suffered from acute condition and no chronic otitis case was observed. The clinical examination of the cases revealed characteristic acute erythematous-ceruminous otitis externa and acute suppurative otitis externa.

The rectal temperature, heart rate and respiratory rate were within normal physiological limits throughout the observation period. The colour of mucous membrane was normal in all the cases throughout the observation period.

The microorganisms were isolated from 87.5% of normal ears, which included *Staphylococcus* spp., *Pseudomonas aeruginosa, S. pyogenes, E. coli* and *Candida* spp. However, remaining 12.5% *ears* were microbiologically negative for any bacteria or fungi. The most common bacterium isolated from normal ear was *Staphylococcus* spp. (37.5%) followed by *S. pyogenes* (25.0%), *P. aeruginosa* (12.5%) and *E. coli* (12.5%). The fungus *Candida* spp was isolated from 37.5% normal ears. In non-otitic ears *Candida* spp was always present along with some bacterial pathogen like *Staphylococcus* (25%) and *Pseudomonas* (12.5%).

All the eight ears with otitis were found positive for bacteria or bacteria along with fungal infection. Bacteria isolated from otitic ears included *S. intermedius, Pseudomonas aeruginosa, S. pyogenes, K. pneumoniae* and *Proteus morganii.* Among the bacterial isolates, *S. intermedius* (37.5%) was the most common followed by *Pseudomonas aeruginosa* (25.00%). Bacteria *S. pyogenes, K. pneumonae* and *Proteus morganii* were present in 12.5% cases each. The yeast isolated from otitic ears were *Candida* spp. (62.5% of cases) and *Trichosporon* spp. (12.5% cases). No yeast was found in remaining 25.00% otitic ears. The yeast were always present in association with bacteria in otitic cases. *Candida* spp coexisted in otitic ear with bacteria in all the three cases of *S.intermedius and* two cases of *Pseudomonas aeruginosa. Trichosporon* spp. was found in association with *S. pyogenes* spp. in one of the two otitic ears having *S. pyogenes* infection.

The otitic ears were cleaned daily with normal saline solution and with 1% H2O2. The antibiotic selected on the basis of sensitivity was chloramphenicol. The otic drops 'Pyrimon' having chloramphenicol were used as 5-6 drops TID. Systemic antibiotic inj. enrofloxacin 2.5 mg/kg body weight OD, I/M and Tab. Nuforce (having ketoconazale) @5-10 mg/kg body weight once was also given in few cases where the presence of *Candida* fungi was recorded in culture examaination.

After initiation of the treatment the bacterial isolation started to decrease and on day 15 only two samples were positive for bacteria namely *P.aeruginosa* in one case and of *Staphylococcus* spp. in another case. However, the ears in all the 6 dog were dry without any discharge, swelling or oedema in or around the ear. All the six dogs made satisfactory recovery.

The normal auditory canal of dog is not sterile, it contains a number of different microorganisms, which are in equilibrium with the host and with each other (Kiss *et al.*, 1997). The micro-organisms isolated from normal ear canal in the present study have been reported in earlier studies by Chengappa *et al.* (1983) and Scott *et al.* (2001).

The microorganisms frequently isolated from the cultures of otitic ear in the present study was *Candida* spp and

Staphylococcus intermedius. Kiss *et al.*(1997) also reported isolation of yeast *M.pachydermatis* alone in 43.30% cases and alongwith *Staphylococcus intermedius* in 23.30% cases. They also reported isolation of *Candida albicans* from the otitic ears. The 2nd most common isolated bacteria from otitic ear in present study was *Pseudomonas aeruginosa.* Kiss *et al.* (1997) also reported a high occurrence (12.62%) of *P. aeruginosa* in cases of otitis externa in dogs.

It was concluded that polymicrobial infection was common in cases of otitis. Infection with fungi *Candida spp* in association with bacterial organisms namely *Streptococcus* and *Pseudomonas aeruginosa was the common cause of otitis in dogs.* The drug for treatment of such cases should contain an antifungal ingredient, an antibacterial component active against *Streptococcus* and *P. aeruginosa,* antipruritic and antiinflammatory component as well as a suitable vehicle which can dissolve and penetrate the cerumen.

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