Clinico-Microbiological Study of the Normal and Otitic External Ear Canals in Dogs and Cats

Yoshiko UCHIDA, Tetsuya NAKADE, and Kaoru KITAZAWA

Department of Veterinary Surgery II, School of Veterinary Medicine, Rakuno Gakuen University, Ebetsu, Hokkaido 069, Japan

(Received 27 December 1988/Accepted 21 November 1989)

— *Jpn. J. Vet. Sci.* 52(2): 415–417, 1990

KEY WORDS: cat, dog, otitis externa.

Otitis externa is one of the most common diseases in dogs and cats. There have been lots of studies about the etiology of otitis externa [1, 4, 7, 8, 10, 12, 13]. And many authors reported on the microorganisms of both normal and otitic ears of dogs [1–3, 6–9, 11, 13, 15].

We made a clinico-microbiological investigation into external ear canals of dogs and cats inhabiting in the suburbs of Sapporo, Hokkaido. The study was performed both on 50 dogs (100 canals) and 50 cats (100 canals) with normal ear, and on 22 dogs (37 canals) and 3 cats (5 canals) with otitis externa before treatment. They were anesthetized with ketamine (5 mg/kg i.v.) immediately prior to sampling and otoscopic examination. Samples were obtained from the juncture of the vertical and horizontal part of the ear canal by the sterile technique of Dickson and Love [6]. They were inoculated on blood agar plates and MacConkey agar plates and were incubated at 37°C for 24 hr for bacterial growth. For proliferation of yeasts, Sabouraud dextrose agar plates were incubated at 25°C for 14 days.

After the sampling, ear canals were examined otoscopically. The volume and color of cerumen, the presence of hyperemia, ulceration and hyperplasia of the ear canals were recorded. The color, transparency and the presence of perforations of the tympanic membrane were also checked and noted.

The results of otoscopic examinations of clinically normal animals revealed that the colors of cerumen in dogs were yellow to dark brown and in cats white to milk white. Obviously, cats had a smaller quantity of cerumen compared to dogs. But both animals had no hyperemia, ulceration or hyperplasia in their ear canals. The tympanic membranes were also normal.

In otoscopic examinations of animals with otitis externa, slight to obvious erythema were seen at auricles and ear canals of all. Ulcerations and hyperplasia of canals and perforation of tympanic membranes in some cases were also

observed. We had only 5 canals of otitic cats, one of which was diagnosed histopathologically as a ceruminoma and another as a granulomatous inflammation.

From clinically normal animals, a total of 186 isolates were obtained. No organisms were isolated from either canal of 8 dogs or 19 cats. Of the remaining 42 dogs, 133 isolates were obtained from 71 canals. Among them, 117 isolates belonged to gram-positive cocci, 11 to gram-positive rods, 1 to gram-negative rods and 4 to yeasts. And of the remaining 31 cats, 53 isolates were obtained from 43 canals. Forty isolated belonged to gram-positive cocci, 9 to gram-positive rods and 4 to gram-negative rods. The identification of 117 cocci from dogs was as follows: 78 isolates belonged to staphylococci, 33 to micrococci and 6 to streptococci. In cats, of 40 cocci, 35 belonged to staphylococci and 5 to micrococci. Staphylococci species are shown in Table 1. Identification was performed according to the method of Sneath [16]. *Staphylococcus hyicus subsp. chromogenes* was identified more often than any other species.

Microorganisms isolated from animals with otitis externa are shown in Table 2. A total of 54 isolates were obtained: 25 isolates belonged to cocci, 6 to rods and 23 to yeasts. Drug sensitivity tests were performed on staphylococci isolated from otitic canals using the disc-diffusion method (Table 3).

We obtained a large number of isolates not only from otitic canals but also from normal canals in this study. In normal ear canals, more isolates were obtained from dogs than cats. And dogs and cats showed differences in cerumen, such as color and volume. This is a very interesting fact when we consider the differences in incidence of otitis externa in dogs and cats.

Staphylococci are more common skin bacteria in human and other mammals. Kloos and Schleifer reported species of staphylococci from human skin [12, 14]. The similar report of staphylococci from cats has also been published [5]. In this study staphylococci amounted to approximately

Table 1. Species of Staphylococci isolated from clinically normal dogs and cats

Species	No. of strains isolated	
	Dogs	Cats
<i>S. hyicus subsp. chromogenes</i>	22	26
<i>S. epidermidis</i>	15	4
<i>S. saccharolyticus</i>	6	1
<i>S. intermedius</i>	5	—
<i>S. simulans</i>	5	—
<i>S. warneri</i>	5	—
<i>S. saprophyticus</i>	1	1
total	78	35

Table 2. Microorganisms isolated from dogs and cats with otitis externa

Species	No. of isolates	
	Dogs	Cats
<i>Staphylococcus intermedius</i>	8	3
<i>Staphylococcus aureus</i>	1	1
<i>Staphylococcus hyicus subsp. chromogenes</i>	6	1
<i>Staphylococcus haemolyticus</i>	5	—
<i>Pseudomonas spp.</i>	2	—
<i>Bacillus spp.</i>	2	—
<i>Corynebacterium spp.</i>	1	1
<i>Malassezia spp.</i>	20	2
<i>Candida sp.</i>	1	—
total	45	8

Table 3. Drug sensitivity of 25 Staphylococci isolates from dogs and cats with otitis externa

Drug	sensitivity	moderate sensitivity	moderate resistance	resistance
Cez	21	4	—	—
C	18	7	—	—
G M	16	9	—	—
F	8	7	7	3
P b	—	15	4	6

Cez: Cefazolin C: Chloramphenicol GM: Gentamycin
F: Fradiomycin Pb: Ampicillin.

60% of isolates from normal canals. *S. hyicus subsp. chromogenes* was identified more often than any other species from both normal dogs and cats.

Most microorganisms from normal canals and otitic canals are the same organisms. Only *Staphylococcus aureus* and *Candida spp.* were isolated only from otitic canals alone. According to drug sensitivity of staphylococci from otitic canals, cefazolin, chloramphenicol and gentamycin were good for treatment of otitis externa when staphylococci were isolated.

ACKNOWLEDGEMENTS. We are indebted to Prof. Dr. T. Hiramune, and Dr. N. Kikuchi, Department of Epizootiology of our university, for encouragements and valuable suggestions.

REFERENCES

1. Baba, E., Fukata, T., and Saito, M. 1981. *Vet. Rec.* 108: 393-395.
2. Baxter, M. 1976. *J. Small Anim. Pract.* 15: 231-234.
3. Blue, J. L. and Wooley, R. E. 1977. *J. Am. Vet. Med. Assoc.* 171: 362-363.
4. Chamberlain, K. M. 1978. *J. Small Anim. Pract.* 19: 493-505.
5. Devrises, L. A., Nzuambe, D., and Godard, C. 1984. *Vet. Microbiol.* 9: 279-285.
6. Dickson, D. B. and Love, D. N. 1983. *Small Anim. Pract.* 24: 413-421.
7. Fraser, G. 1961. *Vet. Rec.* 73: 55-58.
8. Fraser, G. 1965. *J. Small Anim. Pract.* 6: 445-452.
9. Fukuyama, M., et al. 1979. *Bull. Azabu Vet. Coll.* 219-224 (in Japanese with English summary).
10. Grono, L. R. 1969. *Vet. Rec.* 5: 6-8.
11. Grono, L. R. 1969. *Aust. Vet. J.* 49: 420-422.
12. Kloos, W. E. and Schleifer, K. H. 1975. *Int. J. Syst. Bacteriol.* 25: 62-79.
13. Pugh, K. E., Evans, J. M., and Hendy, P. G. 1974. *Small Anim. Pract.* 15: 387-400.
14. Schleifer, K. H. and Kolls, W. E. 1975. *Int. J. Syst. Bacteriol.* 25: 50-61.
15. Sharma, V. D. and Rhoades, H. E. 1975. *J. Small Anim. Pract.* 16: 241-247.
16. Sneath, Peter, H. A. 1986. pp. 1003-1035. In: *Bergey's Manual of Systematic Bacteriology*. Vol. 2., Williams & Wilkins, Baltimore.

要 約

イヌとネコにおける外耳道の臨床微生物学的観察(短報): 内田佳子・中出哲也・北澤 馨(酪農学園大学家畜外科学第二教室)——イヌとネコの札幌近郊における外耳炎の基礎的研究として、正常なイヌとネコ各50頭と外耳炎のイヌ22頭ネコ3頭の臨床微生物学的調査を行った。正常動物では186株の微生物が分離され、特に *S. hyicus subsp. chromogenes* が高率に分離された。外耳炎動物では全耳道に発赤がみられ潰瘍や鼓膜窄孔も観察された。分離された微生物は合計54株で、外耳炎材料からのみ分離されたのは *S. aureus* と *Candida sp.* であった。