

PREVALENCE OF MALASSEZIA PACHYDERMATIS AND OTHER ORGANISMS IN HEALTHY AND INFECTED DOGS EARS

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Abstract

A total of 99 healthy and 101 otitic ears was screened for the presence of *Malassezia pachydermatis* and other organisms on the basis of microscopic and cultural examination. In healthy ears *Malassezia pachydermatis* was found in 39.39 and 45.45 per cent samples by roll smear cytology and cultural examination, respectively, while in otitic ears, it was isolated from 82.18 per cent of the samples by both smear cytology and cultural examination. The associated flora from otitic ears included *Staphylococcus* spp followed by *Pseudomonas aeruginosa*, *Proteus* spp, *Candida* spp, *Aspergillus* spp and *Streptococcus* spp in decreasing order of prevalence while healthy ears revealed *Staphylococcus* spp (32), *Streptococcus* spp (2), *Candida* spp (9) and *Aspergillus* spp (7). The cases were recorded throughout the year however, the highest incidence of dogs with otitis externa was recorded in June indicating that weather may influence the occurrence of *Malassezia* in otitis externa. The highest percentage of dogs having *Malassezia* otitis externa were seen in the two to four years age group with German shepherd as the most frequently affected breed followed by Labrador retrievers. Dogs of either sex were found equally susceptible to infection.

Introduction

Otitis externa is not a life-threatening disease but can be frustrating for both patients and owners. In the last two decades, the opportunistic nature of *M. pachydermatis* has been clearly demonstrated (1). The clinical management of otitis externa is often frustrating because there are many predisposing factors and diseases that cause otitis and many different secondary pathogens that perpetuate the process of the disease. Canine otitis externa is very often complicated by combined bacterial and yeast infections.

More recently, interest in *M. pachydermatis* has increased with the recognition that the organism may be recovered from the ears of healthy as well as dogs having otitis externa (2). Skin colonization of this organism is common in pet carnivores, which may constitute a source of infection for susceptible humans (3). Therefore, the public health importance of this

organism should be considered. For this reason, the present study, which is the first study on *M. pachydermatis* associated with otitis externa in Indian dogs, was undertaken.

Materials and Methods

A total of 200 ear swabs were collected aseptically from 99 healthy and 101 otitic ears during October 1999 through September 2000. For cytological examination, ear swabs were rolled on a clean grease-free glass slide, fixed by gentle heating and then stained with new methylene blue. The samples were also inoculated on Sabouraud's dextrose and blood agar plates, which were incubated at 37°C for up to seven days. The colonies were characterised using standard microbiological procedures.

Results

Malassezia pachydermatis was found prevalent in 39.39 per cent and 45.45 per cent samples from healthy ears by roll smear cytology and cultural examination respectively, while in otitic ears, it was positive both cytologically and culturally in 82.18 per cent of the samples. The associated flora from otitic ears included primarily *Staphylococcus* spp followed by *Pseudomonas aeruginosa*, *Proteus* spp, *Candida* spp, *Aspergillus* spp and *Streptococcus* spp in decreasing order of prevalence/occurrence. The healthy ears yielded *Staphylococcus* spp in 32, *Streptococcus* spp in 2, *Candida* spp in 9 and *Aspergillus* spp in 7 samples. The cases were recorded throughout the year but the highest percentage was recorded in June indicating that weather may affect the occurrence of *Malassezia* otitis externa in dogs (Table 1). The highest percentage of dogs having *Malassezia* otitis externa was seen in the two to four years age group (Table 2). German shepherds were most frequently affected breed followed by Labrador retrievers (Table 3). Dogs of either sex were found equally susceptible to infection.

Table 1: Incidence and frequency of organisms isolated from clinical cases of otitis externa and month of year.

Month	No. of ears examined	No. of ears positive				
		Malassizia Pachydermatitis	Staphylococcus Spp.	Pseudomonas aeruginosa	Proteus Spp	others
January	8	6	6	-	-	4

February	4	3	3	-	-	1
March	5	4	2	-	1	1
April	7	5	4	1	2	2
May	10	4	4	5	4	5
June	13	13	11	2	-	3
July	9	6	6	2	3	3
August	11	9	8	3	2	2
September	9	9	7	5	-	2
October	7	7	4	5	-	-
November	8	8	6	2	-	2
December	10	9	9	2	1	4
Total	101	83	70	27	13	29

Others = Streptococcus spp. (7), Candida spp. (13) and Aspergillus spp. (9)

Table 2: Incidence of otitis externa in different age groups of dogs.

Age Group	No. of otitic ears examined	Culturally positive						
		Malasszia Pachydermatits	Staphylococcus Spp.	Pseudomonas aeroginosa	Proteus Spp	Malasszia Pachydermatits	Candida spp	Aspergillus spp.
Up to 2 yrs	20	15	11	6	2	3	-	7
2 to 4 yrs	44	37	35	16	8	2	6	2
4 to 6 yrs	27	22	17	4	1	-	6	-

6 to 8 yrs	7	6	6	-	2	2	-	-
8 to 10 yrs	1	1	-	-	-	-	1	-
>10 yrs	2	2	1	1	-	-	-	-
Total	101	83	70	27	13	7	13	9

Table 3: Organisms associated with otitis externa in different breeds of dogs.

Breeds	No. of otitic ears examined	No. of positive ears				
		Malassizia Pachydermatits	Staphylococcus Spp.	Pseudomonas aeruginosa	Proteus Spp	Other s
Labrador retriever	10	10	10	2	-	-
German shepherd	61	52	35	14	6	18
Cocker spaniel	4	2	4	2	2	2
Dobermann	9	9	6	7	-	3
Dalmatian	4	4	2	-	-	2
Dachshund	2	-	2	-	2	-
Pointer	2	2	2	-	-	-
Boxer	2	-	2	-	-	2

Gaddi	3	3	3	-	-	2
Spitz	3	1	3	1	2	-
Non descript	1	-	1	1	1	-
Total	101	83	70	27	13	29

Others = Streptococcus spp. (7), Candida spp. (13) and Aspergillus spp. (9).

Discussion

In the present study, the prevalence of *M. pachydermatis* in healthy ears was 39.39 per cent and 45.45 percent on roll smear cytology and cultural examination, respectively. Our studies on prevalence of *M. pachydermatis* were in close agreement with the findings of others (4,5,6,7,8) who found a high prevalence on cultural examination. However, Nobre *et al.*, (2) reported 16.7 per cent incidence from healthy ears for *M. pachydermatis* on direct microscopic examination while cultural examination revealed an incidence of 25.0 per cent for this yeast. Similarly, Gustafson (9), Gedek *et al.* (10) and Wallmann (11) reported low prevalence rates of *M. pachydermatis* as 5.0, 17.0 and 7.5 per cent, respectively from normal ears by cultural examination.

The prevalence rate of *M. pachydermatis* associated with clinical cases of otitis externa reported here (82.18 per cent) is almost similar to those reported by Gustafson (9), Fraser (12), Nobre *et al.* (2), Wallmann (11) and Kiss *et al.* (13), as more than 70 percent. Further, Baxter (5), Gedek *et al.* (10), Bornand (14) and Kiss and Szigeti (15) reported 56, 57, 56 and 50.90 per cent respectively. Other microorganisms isolated from otitic ears in this study were *Staphylococcus* spp (69.31%), *Pseudomonas aeruginosa* (26.73%), *Proteus* spp (12.87%), *Candida* spp (12.87%), *Aspergillus* spp (8.91%) and *Streptococcus* spp (6.93%). Similar results were found in another report from India in which Kumar and Rao (16) found Staphylococci in 75 % and *Pseudomonas* spp in 17.5 %. In the United States Sharma and Rhodes (4) examined 115 otitic dogs and found *Staphylococcus* spp in 24.5%, *Pseudomonas aeruginosa* in 18.1%, *Proteus mirabilis* in 3.9%, *Candida* in 0.7%, *Aspergillus* in 0.7% and *Streptococcus* spp in 5.2% while Gedek *et al.* (10) reported 20.8%, 12.6%, 0.6%, 3.1%, 0.0% and 6.8% respectively. Bornand (14) reported similar findings in relation to *Staphylococcus* spp, *Pseudomonas* spp, *Proteus* spp and *Streptococci* spp. The findings of Kiss *et al.* (13) for Staphylococci and *Pseudomonas* spp were 39.22 % and 12.62 % respectively. In the present study, it was learned that pet owners were not performing ear cleaning regularly. The high isolation rates of these organisms can also be explained by the reason that the northern part of

India, where this study was undertaken, is hot and humid for almost six months in a year and the incidence of otitis is said to be more prevalent in hot humid climates (17).

Monthwise distribution of otitis externa revealed that 15.17 per cent cases were recorded during June followed by 10.84 per cent each in August, September and December. It was further observed that 73.49 per cent of the cases associated with *M. pachydermatis* were reported during June through December indicating that weather influences the occurrence of *Malassezia* otitis externa in dogs. However, Sharma and Rhodes (4) in the United States reported no significant relationship in the occurrence of otitis externa by month, relative humidity and temperature. But they reported that the percentage of dogs admitted with otitis externa was highest in summer (July and August) and was greatest in dogs with pendulous ears with long hair on the ears. Grono (18) reported a similar finding that a pendulous ear allows a somewhat higher relative humidity within the ear canal along with stasis of ceruminous discharges that becomes infected secondarily and predisposes the ears to *Malassezia* organisms replication in both health and disease. In the present investigation, the highest percentage (62.65%) of *Malassezia* otitis externa was recorded in German shepherds but the percentage (83.33%) of dogs with long pendulous ears and otitis externa was similar to that 81.54% of dogs with erect ears and medium hair on the ears. In contrast, Sharma and Rhoades (2) reported that the highest percentage (5.2%) of dogs admitted had pendulous ears with long hair on their ears, while the lowest percentage (2.14%) had short erect ears without much hair. The fact that the temperature and relative humidity is very high during the season of June through October in northern India and the increased incidence of bathing dogs with unplugged ear canals leading to excessive accumulation of moisture might make them more prone to otitis externa. McKeever and Globus (19) have reported that excessive moisture and high relative humidity in the ear canal predispose dogs to otitis externa.

The occurrence of *Malassezia* otitis was found highest (44.58%) in dogs aged two to four years, which is very similar to the findings of Fraser *et al.* (17) who reported the peak incidence of otitis externa in four year old dogs, a lower incidence in animals less than one year old and in those over 13 years. Sharma and Rhoades (4) also reported that 35.63 % of the dogs with otitis externa were between one and four years. It was interesting to note that 39 cases of otitis externa also had atopic dermatitis; of these 19 dogs were 2-4 years old and by 12 dogs between 4-6 years of age.

Gender had no influence on the occurrence of *Malassezia* otitis externa in the dog: in 83 cases of *Malassezia* otitis, 44 (53.01%) were male and 39 (46.99%) were female. Sharma and Rhoades (4) have also documented similar findings.

[LINKS TO OTHER ARTICLES IN THIS ISSUE](#)

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