

Diagnosis and Management of *Malassezia* Otitis Externa in Dogs

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Abstract

Canine otitis externa is inflammation of external ear canal, causing discomfort to the patients. In the present study, dogs displaying symptoms of otitis externa associated with *Malassezia* spp. were studied. Twenty-eight dogs were included based on the cytological investigations, out of which 13 being mono-infections of *Malassezia* spp. and 15 being mixed infections involving both *Malassezia* spp. and bacteria. Cytological grading was conducted in all the cases. Animals were categorized into two groups for treatment. Group I (n=15) was given oral Ketoconazole, while Group II (n=13) received Itraconazole. The therapeutic efficacy was assessed on days 7th and 14th post-treatment.

Keywords: Canine, Itraconazole, Ketoconazole, *Malassezia*

Otitis externa is the inflammation of the external ear canal including the ear pinnae and is a complex condition with various underlying causes. Otitis externa develops as a result of predisposing, primary, secondary, and perpetuating factors, while secondary infections (bacterial and fungal overgrowth) are usually a reason dogs are presented to a veterinarian (Forsythe, 2016). The condition is characterized by erythema, pruritis, head shaking, ear exudates of different colors with or without any foul odor, head tilt, ear drooping, etc.

Malassezia spp. yeast for a long time has been identified as a commensal yeast in dogs'

ear and may be associated with otitis externa (Guillot and Bond, 1999). Changes in the micro-environment and defective host immunity seem to be associated with *Malassezia* overgrowth (Bond *et al.*, 2020). *Malassezia* spp., due to its commensal nature, acts as a source of infection to susceptible humans (patients with immunodepression), as a result it has public health importance. Therefore, the present study is conducted to study the clinical signs, diagnosis, and managerial aspects of *Malassezia* associated otitis externa in canines.

Materials and Methods

The present research was conducted at the Department of Veterinary Medicine, COVAS, Palampur spanned from June 2022 to July 2023. Patients were primarily examined for evident clinical manifestations. Subsequently, laboratory investigations were conducted, which included ear swab cytology and microbiological examinations. Cytological evaluations comprised the collection of exudates from each ear, followed by staining with Himedia Giemsa Stain and cytological grading was done where grade 0 was given when no organism was observed on cytosmear, grade I when 1-5 organisms were present, grade II when 6-10 organisms were present, grade III when 11-30 organisms were present and grade IV when more than 30 organisms were observed per field in cytosmear (Zur *et al.* 2011). For microbiological examinations, ear swabs were inoculated onto Seaboard's dextrose agar (SDA) under sterile conditions and were then placed in an incubator at 25°C for 5-7 days. The macroscopic and microscopic characteristics of the microorganisms were observed and recorded. Comprehen-

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sive data, encompassing clinical observations, otoscopic findings, cytological analyses, microbiological cultures, and therapeutic approaches, were meticulously documented for all cases. Post-therapeutic evaluation was based on a semi-quantitative analysis of cytological smears which was performed by comparing the average number of organisms per field (OPF) (Ginel *et al.* 2002).

Results and Discussions

A total of 81 dogs were presented with various ear affections to the Department of Veterinary Medicine, DGCN, COVAS, Palampur from June 2022 to July 2023. Out of these 81 canine patients presented with ear affections, 28 revealed *Malassezia* spp. infection with 13 being mono-infection and 15 being poly-infections involving both *Malassezia* spp. and bacteria. Notably, 71.42% of males and 28.57% of females were affected, suggesting a potential male overrepresentation. Dogs with pendulous ears (67.85%) were more susceptible, likely due to hindered drying and increased internal moisture. Common clinical signs included aural exudates (100%), pruritic (84.61%), malodor (69.23%), head shaking (61.53%), and ear pinna swelling (61.53%). While exudate in the pinnae (38.46%), erythematous pinnae (30.76%), hyper pigmentation (7.69%), and crusted ear pinnae (7.69%) were also seen in some cases. Otoscopic examination showed a dark, brown-colored exudate in 89.28% of cases and a pale, white-colored exudate in 10.71% of cases. Similar clinical observations were documented by Mhatre (2005) regarding *Malassezia* spp. causing otitis in dogs.

Cytological examination revealed mono-infection of *Malassezia* spp. in 13 cases (Fig 1) while poly-infection of *Malassezia* along with bacteria in 15 cases (Fig 2). In 28 cases a total of 30 cytosmears were examined and graded into four grades (I to IV). In two cases, the left and right ear canals revealed different microflora upon cytological examinations. Most of the slides were with grade III infection (19/30) followed by grade IV (9/30) and grade II (2/30), while none of the slides with grade I infection. Also, *Malassezia* alone was observed in 13/30 cytosmears, and *Malassezia* along with bacteria (cocci or rods) seven and along with neutrophils were observed in 10/30 cytosmears. No *Malassezia* spp. alone with neutrophils were noted in any case (Table I).

Upon isolation, where *Malassezia* spp. was isolated only in 13 cases (Fig 2.) while bacterial isolates were identified, with *Staphylococcus* spp. being the most prevalent (40%), followed by *Klebsiella* spp. (20%), *Pseudomonas* spp. (13.33%), and *E. coli* (6.66%) in mixed infections. Similar findings were noted by Lyskova *et al.* (2007).

Affected animals were divided into two treatment groups. Group I was administered oral ketoconazole @ 10mg/kg body weight once daily along with oral amoxyclav @ 25mg/ Kg body weight twice daily, while Group II received oral itraconazole @ 5 mg/kg body weight once daily along with oral cefpodoxime @ 10mg/ Kg body weight once daily, both for at least 14 days. Additionally, topical treatment involved cleaning the ears with a 2% Salicylic acid ear cleanser once daily for 7-10 days, followed by

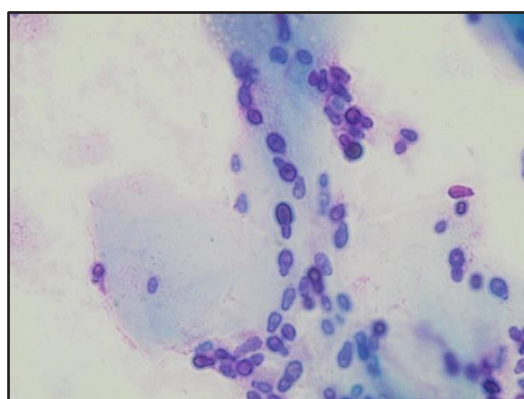


Fig 1. Mono-infection of *Malassezia* spp. in otitis externa (Grade IV)

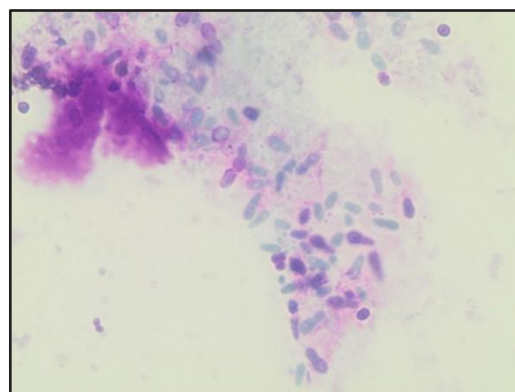


Fig 2. *Malassezia* infection associated with cocci-shaped bacteria (Grade IV)

Table I : Cytological analysis of ear exudate along with cytosmear grading

Type of microorganism	Grade I	Grade II	Grade III	Grade IV	Total
<i>Malassezia</i> spp.	-	1	9	3	13
Cocci + <i>Malassezia</i> spp.	-	1	4	0	5
Cocci + Rods + <i>Malassezia</i> spp.	-	-	-	2	2
Bacteria+ <i>Malassezia</i> +Neutrophil	-	-	6	4	10
Total	-	2	19	9	30



Fig 3. *Malassezia* spp. on SDA

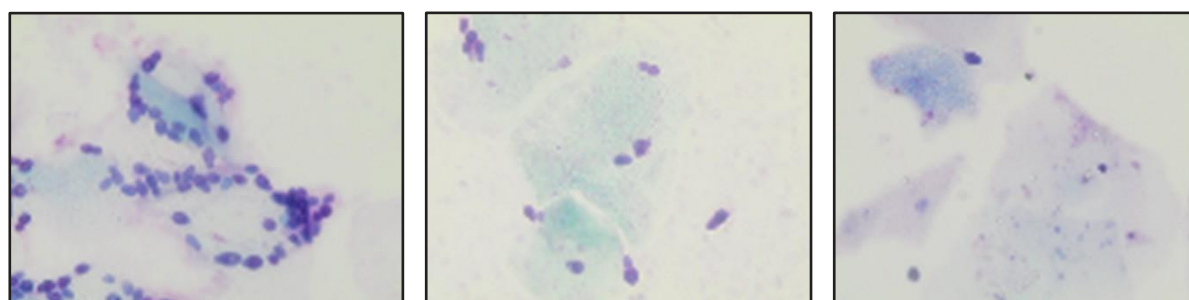
The effectiveness of both treatment protocols was assessed through cytological examination on Day 7 and Day 14, as well as a reduction in observable clinical symptoms. Data on the cytological investigation pre and post-treatment are presented in Table II given below.

Before treatment on day 0, the average number of organisms per field (OPF) in Group I was 18.28 ± 2.90 . Following treatment on day 7, the OPF significantly decreased to a mean value of 2.85 ± 1.01 . By day 14 post-treatment, the mean OPF in Group I was 0.71 ± 0.35 . In Group II, the average number of OPF before treatment on day 0 was 23.83 ± 2.94 , which significantly dropped to 0.83 ± 0.54 on day 7 post-treatment. Remarkably, on day 14 post-treatment, no organisms were observed in the cytosmear examination of Group II (Fig 4.). Clinical signs including pruritis, aural-exudate, mal-odour, head shaking, and pain were reduced on day 7 after treatment in Group II while in Group I clinical recovery was noted on day 14 after treatment. The results of

applying Neomycin sulphate (0.5%), Beclomethasone dipropionate (0.025%), Clotrimazole (1.0%) drops in group I while Ofloxacin (0.3%), Clotrimazole (1.0%), Betamethasone dipropionate (0.025%), Lignocaine HCl (2.0%) drops in group II @ 1 ml in the affected ear once daily for 7-10 days. Hydroxyzine was given @ 2 mg/kg body weight for 7 days to reduce itching.

Table II: Post-therapeutic cytological examination in *Malassezia*-associated otitis externa

	Day 0	Day 7	Day 14
Group I(n=15)	18.28 ± 2.90^a	2.85 ± 1.01^{bc}	0.71 ± 0.35^c
Group II(n=13)	23.83 ± 2.94^a	0.83 ± 0.54^{bc}	0^c



Day 1

Day 7

Day 14

Fig 4. Post-therapeutic cytology in the group treated with oral Itraconazole

the treatment showed that Group II experienced a faster recovery within 14 days compared to Group I. This observation corresponds with the findings presented by Boone (2021), who reported positive outcomes with the use of oral itraconazole at a dose of 5mg/kg body weight for cases of *Malassezia*-associated otitis externa. Dogs treated with oral itraconazole displayed quicker improvement due to its higher potency, low toxicity, and broad-spectrum activity (Vishkautsan, 2021).

Summary

From the study, it can be concluded that ear cytology proves to be the most reliable, informative, and rapid diagnostic test in otitis externa and monitoring therapy response. Dogs treated with oral itraconazole showed faster recovery.

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