Studies on *Malassezia* Infection in Otitis External of Dogs

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ABSTRACT

The present study was aimed to investigate the prevalence of *Malassezia* in common ear affections of dogs. A total of 115 dogs with ear affections were evaluated between March 2014 and May 2015. Otoscopic examination and microbiological isolation was done for diagnosis. Case prevalence of *Malassezia* infection in otitis externa was 19.1%. Relatively higher proportion of *Malassezia* was found in males 68.2% (n=15) as compared to females 31.8% (n =7). The yeast was more prevalent in adult dogs (1-3 years old). Labrador, Beagle and Cocker Spanial were breeds more commonly predisposed to otitis externa. The prevalence was relatively higher in rainy season (July-August) 63.6% (n=14) followed by summer (April-June) 18.2% (n=4), winter (December-March) 13.6% (n=3) and autumn (September-November) 4.6% (n=1). Head shaking, frequent itching and malodour were the common presenting signs. It can be concluded that *Malassezia* infection is quite common in otitis externa, and can be diagnosed using otoscopy and microbiological isolation.

Keywords: Cytology, *Malassezia*, otoscopy, treatment

Otitis externa is defined as inflammation of the skin and adnexal structures of the ear canal. This condition is one of the most common and frustrating problems encountered in small animal practice. The diagnosis of otitis media in dogs can be quite difficult due to long, bent, funnel-shaped conformation of the dog’s ear canal making visibility of tympanic membrane (TM) difficult. However, most canine patients with otitis media also have chronic otitis externa with pathologic changes in the ear canal.

Among yeast, *Malassezia* is one of the most common causes to external otitis in dog (Crespo et al., 2002). *Malassezia* is considered as perpetuating factor of otitis externa that exacerbate the inflammatory process and can maintain the disease after the primary factor has been eliminated. They can induce permanent pathologic changes to the ear canal and are the main reasons of treatment failure in otitis externa. Predisposing factors for development of *Malassezia* infection include excessive production of sebum and/or decreased quality of sebum (seborrhoea), accumulation of moisture, damage of epidermis, concurrent dermatoses, atopy, and bacterial skin infections (Patterson et al., 2002). *Malassezia* infections could be secondary to other primary diseases like endocrinopathies (hypothyroidism, hyperadrenocorticism, and diabetes mellitus), keratinisation disorders, immunologic dysfunctions and skin neoplasias (Mauldin, 2002).

An important clinical symptom of *Malassezia* infection is intensive pruritus and strong odour of decomposing fat. Clinical signs in early stages of infection include alopecia, localized or generalized erythema, erythematous papules and macules, crusts and scaly skin on the facial area, the trunk, perianal and interdigital areas and in skin folds. In chronic cases hyperpigmentation and other secondary lesions due to scratching and licking have been reported (Dorogi, 2002).

Malasseziosis has been reported in dogs of various breeds at different ages and in both sexes (Bond et al., 1996). Though numerous studies have been conducted on *Malassezia* infections in dogs, yet a scarce literature is available regarding epidemiological features associated with *Malassezia* infections in otitis externa cases.
MATERIALS AND METHODS
The presence of Malassezia was explored in the ear canal of 115 otitis dogs without any reference for age, sex and breed. A total of 15 healthy dogs were taken as control. All dogs were evaluated before sampling and were categorized as otitis according to their history, clinical signs and otoscopic examination. Otoscopic examination was carried out for each case to confirm the presence of otitis externa, changes in external ear canal epithelium and presence of abnormal secretions in ears canal. The sterile swab samples from the anterior ear canal were examined by direct examination of the slide smear. Slides were stained by methylene blue for cytological examination under microscope. The samples were also inoculated on Sabouraud dextrose agar for isolation and identification of Malassezia. The overall study was aimed to study the prevalence of Malassezia in the ear of dog by otoscopy, cytology and microbiological isolation.

RESULTS AND DISCUSSION
Malassezia was observed in 22 dogs out of a total of 115 dogs examined on the basis of clinical signs, cytology, isolation and identification, and the case prevalence of Malassezia infection in otitis externa was observed to be 19.1%. 17 of the 22 dogs (77.3 %) had pendulous ears and in contrast the prevalence was 22.7% in dogs with erect ears. Numerous studies have been conducted worldwide on Malassezia infections in dogs regarding etiology, diagnosis and management (Cafarchia et al., 2012; Koike et al., 2013; Yurayart et al., 2013; Nardoni et al., 2014; Oldenhoff et al., 2014; Watanabe et al., 2014; Czyzewska et al., 2016). Otitis externa represents one of the most common reasons for which dogs are presented to veterinary attention. More importantly, presence of the yeast in the external ear canal of dogs is more frequent than other parts of the body.

Occurrence of Malassezia was significantly more prevalent in Labrador (45.5%) and Beagle (18.1%) breeds. The high isolation rates of these organisms could be explained by factors as humidity, breed, age, pendulous ears, season, intercurrent diseases (Kumar et al., 2003). Similar to our findings, other studies have reported more involvement of breeds with pendular ears (Kiss et al., 1997), which is probably due to the fact that these dogs are prone to poor ventilation and increased accumulation of moisture in the ear canal. German Shepherd dogs have prick ears but are external otitis prone due to the apocrine glands. The prevalence of Malassezia in males (68.2 %) was significantly higher as compared to females (31.8%). Similarly some researchers reported higher predisposition of male dogs to otitis associated with Malassezia infection as compared to female dogs (Chaudhary and Mirakhur, 2002). Malassezia infection was more prevalent in dogs of 1-3 years age (n=16) followed by below <1 years (n=4) and >3 years (n=2). Season wise, Malassezia infection was highest during the rainy season (July-August) 63.6% followed by summer months (April-June) 18.2%, winter (December-March) 13.6% and autumn (September-November) 4.6%. Otitis prevalence was the highest during the rainy season followed by summer, winter and autumn, though in some studies, prevalence was relatively higher in the autumn (Čonková et al., 2011).

Most Common presenting lesions (Fig. 1) included head shaking, frequent itching, and malodour in both ears (Table 1). In some cases, erythematous-ceruminous (n=19) and blackish waxy (n=5) ear discharge was present with increased amount of cerumen since 20-25 days. The other important features of affected animals included unilateral drooping pinna (n=5) and head tilt (n=3). In some cases (n=6) there was history of water lodgment in the ears while having bath. Alopecia with pruritis was common finding in all the cases as described previously (Charach, 1997). Cerumen was severely increased in all cases of otitis externa, and Malassezia was more likely to be cultured from ears with increased cerumen.

![Fig. 1: Erythematos lesions and lichenification on pinna due to Malassezia](image-url)
Malassezia in dogs

Table 1: Clinical signs of Malassezia associated with otitis externa in dogs

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Clinical Signs</th>
<th>Number of Dogs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pruritis/itching</td>
<td>22</td>
</tr>
<tr>
<td>2</td>
<td>Head Shaking</td>
<td>22</td>
</tr>
<tr>
<td>3</td>
<td>Head Tilting</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Rub against wall</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>Blackish waxy discharge</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Erythematous ceruminous</td>
<td>19</td>
</tr>
<tr>
<td>7</td>
<td>Erythematous lesion</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>Malodorous</td>
<td>22</td>
</tr>
<tr>
<td>9</td>
<td>Water lodgement history</td>
<td>6</td>
</tr>
<tr>
<td>10</td>
<td>Unilateral ear drooping</td>
<td>5</td>
</tr>
</tbody>
</table>

Otoscopic examination was considered adequate in otitic ears of 22 Malassezia cases. In 19 cases, prior to otoscopy, otic flushing was done to remove wax and debris for visualisation of ear canal. Excess hairs, ear wax and debris adhering to the external tympanic membrane were removed (Usui et al., 2011). Otoscopic examination revealed bilateral erythematous, hyperaemia, and ceruminous in horizontal and vertical ear canal but tympanic membrane was visible in 40.9% (9/22) cases. No growth and foreign body was seen in horizontal or vertical ear canal in all the cases (n=22).

In present study, cytology revealed presence of significant increase in yeast count (Fig. 2) 48.75±5.79/40x; Normal range of Malassezia is <5/40x, 5-10/40x is intermediate, while ≥ 10/40x at high power field is considered abnormal (Bahador et al., 2014).

Cytological examination revealed desquamated keratinocytes containing pigments granules, which appeared ovoid or round structures, yellow to brown in colour. Most of the affected dogs had chronic otitis and many of them showed hyperkeratinization and lichenification of the ear epithelium.

Treatment of the affected dogs was done by cleansing the ear of debris and lipid substrates, administration of antifungal agent like clotrimazole topically along with ketoconazole @ 10mg/kg per oral once a day for 10-15 days. Ketoconazole has been reported to be quite effective in the previous studies (Jacobson, 2002; Peano et al., 2008).

REFERENCES


Kamaljyoti et al.


