

Factors Related to the Frequency of Cat Ear Mites (*Otodectes cynotis*)

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Abstract

Otodectes cynotis is an important, highly prevalent ectoparasite responsible for approximately 50% to 84% of otitis externa infestations in cats. This study investigates the factors related to the frequency of infestations in cats in Alanya, Antalya. A total of 105 cats underwent physical examination including ear examination with otoscope. *Otodectes cynotis* infections were found in 28 cats (27.7%). Cats were categorized by sex, age (<1 years, 1-4 years, >4 years), lifestyle (indoors alone, indoors with other pets, outdoors), and clinical symptoms (pruritus, erythema, ulceration, ear discharge, pain) to reveal the association of risk factors with using chi-square tests. Statistically significant differences were between lifestyle and infestation ($P<0.05$).

Keywords: Cat, Ear mite, *Otodectes cynotis*, Risk factors, Turkey

Kedi Kulak Uyuzu (*Otodectes cynotis*) Sıklığı İle İlgili Faktörler

Özet

Otodectes cynotis; kedilerde görülen otitis externa etiyolojisi içerisinde önemli bir yeri olan ve prevalansı (%50-84) oldukça yüksek paraziter bir enfestasyondur. Bu çalışmada, Türkiye'deki kedilerde görülen Oc enfestasyonunun sıklığını etkileyen faktörler araştırılmıştır. Toplamda 105 kedinin her iki kulak kanalında fiziksel ve otoskopik muayeneleri yapılmış ve 28 kedide Oc enfestasyonu tespit edilmiştir (%27.7). Kediler cinsiyet, yaş (<1 yaş, 1-4 yaş, >4 yaş), yaşam tarzları (evde yalnız, evde diğer pet hayvanları ile, dışarıda) ve klinik semptomlar (kaşıntı, eritem, ülserasyon, kulak akıntısı, ağrı) yönünden kategorize edilmiş ve ki-kare testleri kullanılarak bu risk faktörlerinin enfestasyon ile ilişkisi ortaya konmuştur. Yaşam tarzı ve enfestasyon arasında istatistiksel olarak anlamlı bir fark bulunmuştur ($P<0.05$).

Anahtar sözcükler: Kedi, Kulak uyuzu, *Otodectes cynotis*, Risk faktörleri, Türkiye

INTRODUCTION

Otodectes cynotis is an important, highly prevalent ectoparasite, responsible for 50%-84% of otitis externa in cats worldwide. Named by Sweatman ^[1], *Otodectes cynotis* is highly contagious and which was reported to be with zoonotic character ^[2]. The mites live in the ear canals of cats, dogs, foxes, ferrets, and other carnivores and appear as small, white organisms within the ears or on swabs of material removed from ears. The mites feed on skin debris and tissue fluid from the epidermis. Transmission occurs by direct contact. The highest incidence has been noted in kittens. The life cycle, which is completed in the ear, includes larva, protonymph, and deutonymph stages over 18 to 28 days ^[3,4]. Despite these mites' importance as a cause of otitis externa in cats, information about their prevalence and the factors influencing their

survival is lacking ^[5]. This study attempts to identify the factors related to the frequency of infestations in cats in Alanya, Antalya.

MATERIAL and METHODS

The study was carried out at a private animal clinic in 2013 in Alanya, Antalya. A total of 105 cats underwent physical examination and examination of both ear canals were done with an otoscope. Data on cats sex, age, breed, erythema, ulceration, pruritus, pain, secretion amount and type, and the findings of parasitological examination were recorded during the examinations. In all, 28 of 105 cats were found to be infected with *Otodectes cynotis*.

Waxy material from the ear canal was collected by ear cotton swap. This material was examined under a



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microscope by dropping 1-2 ml of mineral oil onto a glass microscope slide to determine the presence or absence of alive mites and the total mite count. Mites were identified using the diagnostic Pictorial Key to Arthropods of Centers for Disease Control, United States Health Education Centers for Disease [6].

Statistical Analysis

Statistical analysis was conducted to create a dataset using the packed statistic program. Cats were categorized into four groups: Sex (female, male), age (<1 years, 1-4 years, >4 years), lifestyle (indoors alone, indoors with other pets, outdoors), and clinical symptoms (pruritus, erythema, ulceration, ear discharge, pain) to reveal the association of risk factors with using chi-square tests. Associations were considered significant at $P < 0.05$.

RESULTS

In this study of effective factors of *Otodectes cynotis* infestation, 28 (27.7%) of 105 cats (male: 49, female: 47, ages: <1->4) were found to be infected. Prevalence distributions by sex, age, and lifestyle are shown in [Table 1](#). All exposure variables were identified with $P < 0.05$. Significant difference was detected with lifestyle (indoor and outdoor) of cats ($P < 0.05$) while no significant difference was detected with living alone or with other pets of indoor cats and with sex or age ($P > 0.05$). Although no statistical differences were found for age, infestation prevalence tended to decrease with age (<1 years 31.3%; 1-4 years 28.2%; >4 years 11.1%) ([Table 1](#)). There was an association between clinic symptoms (pruritus, ear discharge) and infestation ($P < 0.001$) ([Table 2](#)).

Table 1. Factors affecting *Otodectes cynotis* infestation

Tablo 1. *Otodectes cynotis* enfestasyonunu etkileyen faktörler

| Factors | | Otodectes cynotis Infestation | | | | | | |
|------------|-----------|-------------------------------|----------|----------------|----------|----------------|---------|-------|
| | | N | Positive | Prevalence (%) | Negative | Prevalence (%) | P Value | |
| Sex | Male | 49 | 12 | 24.5 | 37 | 75.5 | 0.637 | |
| | Female | 56 | 16 | 28.6 | 40 | 71.4 | | |
| Age | <1 years | 48 | 15 | 31.3 | 33 | 68.8 | 0.248 | |
| | 1-4 years | 39 | 11 | 28.2 | 28 | 71.8 | | |
| | >4years | 18 | 2 | 11.1 | 16 | 88.9 | | |
| Life style | Indoor | Alone | 63 | 11 | 17.5 | 52 | 82.5 | 0.310 |
| | | With other pets | 27 | 8 | 29.6 | 19 | 70.4 | |
| | | Total | 90 | 19 | 21.1 | 71 | 78.9 | |
| | Outdoor | 15 | 9 | 60.0 | 6 | 40.0 | 0.003 | |

Table 2. Association between clinic symptoms with infestation

Tablo 2. Enfestasyon ile klinik semptomlar arasındaki ilişki

| Clinical Symptoms | | Otodectes cynotis Infestation | | | | | |
|-------------------|-----|-------------------------------|----------|----------------|----------|----------------|---------|
| | | N | Positive | Prevalence (%) | Negative | Prevalence (%) | P Value |
| Pruritus | Yes | 51 | 28 | 54.9 | 23 | 45.1 | 0.000 |
| | No | 54 | 0 | 0 | 54 | 100 | |
| Erythema | Yes | 62 | 16 | 25.8 | 46 | 74.12 | 0.811 |
| | No | 43 | 12 | 27.9 | 31 | 72.1 | |
| Ulceration | Yes | 64 | 12 | 18.8 | 52 | 81.3 | 0.022 |
| | No | 41 | 16 | 39.0 | 25 | 61.0 | |
| Ear discharge | Yes | 41 | 28 | 68.3 | 13 | 31.7 | 0.000 |
| | No | 64 | 0 | 0 | 64 | 100 | |
| Pain | Yes | 80 | 25 | 31.3 | 55 | 68.8 | 0.057 |
| | No | 25 | 3 | 12.0 | 22 | 88.0 | |

DISCUSSION

Otodectes cynotis is an extremely important external parasite that causes infestations in cats [3,7]. The prevalence of *Otodectes cynotis* in cats has been reported at 25.5%-29% in Greece and London and 22.5%-37% of feral cats in the United States [8-10]. In the present study, the prevalence of *Otodectes cynotis* infestation was 27.7%, similar to previous findings.

Although the parasite can affect all age groups of cats, it is seen more frequently in the kittens (<1 year old) due to transmission from infested mothers [7,11,12]. However, the present study found no association between age and the presence of mite infestation, though statistical analysis showed that infestation prevalence decreased with age. Some studies have shown that both male and female cats are susceptible [5,9,13,14]. Accordingly, no significant difference was found in the prevalence of *Otodectes cynotis* in male (24.5%) and female cats (28.6%).

There was an association between lifestyle and infestation, with a higher prevalence in outdoor cats (60%). Many authors have suggested that infestations are more common among animals living in poor environmental conditions and among street animals [5,14]. Degi et al. [15] have reported that outdoor cats (84%) are more affected than indoor cats (16%). However, these results do not agree with the claim of Sotiraki et al. [9] that lifestyle has not been proven to have a significant effect on risk of infestation.

The parasite is easily transmitted through contact with infected animals, whether of the same or a different species [9,11,16]. The present study found a significant difference associated with cats lifestyle. However the prevalence among cats which lived indoors alone (17.5%) was lower than that among indoor cats living with other pets (29.6%) there was no statistically significant difference. Also Degi et al. [15] have reported no infested cat observed that contact with other animals.

Otodectes cynotis might cause otitis externa in up to half 50% of cases worldwide, while 84% of cats with ear discharge have been diagnosed with the agent [9,17,18]. Clinical symptoms (pruritus, erythema, ulceration, ear discharge, pain) have been observed in infected animals depending on the level of parasitism [12,19,20]. This finding is in agreement with the results of the present study. Some researchers have observed otic pruritus in non-parasitized cats (9.2%) [7]. The infestation had a characteristic appearance like outer ear canal was filled with various amounts of a dry, dark, red-brown substance [9,11]. Approximately 85.4% of infested cats have been observed to have abnormal ear secretion, and 41.5% suffer from mechanical irritation caused by the parasite [9,11,21]. We found an association with symptoms (pruritus, ear discharge) and infestation, however rarely some cases can be asymptomatic [9,21,22].

In conclusion, we found that *Otodectes cynotis* is a highly common ectoparasite in cats. The potential risk of infestation varies by age and sex. Additionally, lifestyle influenced infestation prevalence. Clinical signs of ear mites were not always apparent, but higher rates of *Otodectes cynotis* infestation were found among cats with pruritus, erythema, ulceration, ear discharge, and pain.

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