

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 etiyolojisinde 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, yaşı (<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.

REFERENCES

1. Sweatman GK: Biology of *Otodectes cynotis*, the ear canker mite of carnivores. *Can J Zool*, 36, 849-862, 1958. DOI: 10.1139/z58-072
2. Kato T, Ito Y, Nakao H, Kadosaka T: Tinnitus caused by tiny mites suspected cases of erratic migration of *Otodectes cynotis* and a case of *Aleuroglyphus ovatus* infestation. *Med Entomol Zool*, 62, 199-204, 2011.
3. Bowman DD, Hendrix CM, Lindsay DS, Barr SC: Feline Clinical Parasitology. 375-400, Wiley-Blackwell, Hoboken, 2002.
4. Zajac AM, Conboy GA: Veterinary Clinical Parasitology. 8th ed., 217-230, Wiley-Blackwell, UK, 2012.
5. Souza CP, Ramadinha RR, Scott FB, Pereira MJS: Factors associated with the prevalence of *Otodectes cynotis* in an ambulatory population of dogs. *Pesq Vet Bras*, 28, 375-378, 2008. DOI: 10.1590/S0100-736X2008000800005
6. Anonymous: Pictorial Key to Arthropods, Reptiles, Birds and Mammals of Public Health Significance. Centers for Disease Control, United States Health Education and Welfare, 1-192, 1966.
7. Scott DW, Miller WH, Griffin CE: Muller and Kirk's Small Animal Dermatology. 6th ed., 450-452, WB Saunders, Philadelphia, 2001.
8. Beresford-Jones W: Observations on the incidence of *Otodectes cynotis* (Hering) on dogs and cats in the London area. *Vet Rec*, 67, 716-717, 1955.
9. Sotiraki ST, Koutinas AF, Leontides LS, Adamama-Moraitou KK, Himonas CA: Factors affecting frequency of ear canal and face infestation by *Otodectes Cynotis* in cat. *Vet Parasitol*, 96, 309-315, 2001. DOI: 10.1016/S0304-4017(01)00383-1
10. Akuczewich LH, Philman K, Clark A, Gillespie J, Kunkle G, Nicklin CF, Greiner EC: Prevalence of ectoparasites in a population of feral cats from north central Florida during the summer. *Vet Parasitol*, 109, 129-139, 2002. DOI: 10.1016/S0304-4017(02)00205-4
11. Harwey RG, McKeever PJ: Skin Diseases of The Dog and Cat. 2nd ed., 83, Manson Publishing Limited, London, 2009.
12. Salib FA, Baraka TA: Epidemiology, genetic divergence and acaricides of *Otodectes cynotis* in cats and dogs. *Vet World*, 4, 109-112, 2011.
13. Lefkaditis MA, Koukeri SE, Mihalca AD: Prevalence and intensity of *Otodectes cynotis* in kittens from Thessaloniki area, Greece. *Vet Parasitol*, 163, 374-375, 2009. DOI: 10.1016/j.vetpar.2009.04.027
14. Mosallanejad B, Alborzi AR, Katvandi N: Prevalence and intensity of *Otodectes cynotis* in client-owned cats in Ahvaz, Iran. *Asian J Anim Vet Adv*, 6, 642-647, 2011. DOI: 10.3923/ajava.2011.642.647
15. Degi J, Cristina RT, Codreanu M: Researches regarding the incidence of infestation with *Otodectes cynotis* in cats. *Vet Med*, 56, 84-92, 2010.
16. Tonn RJ: Studies on the ear mite *Otodectes cynotis*, including life cycle. *Ann Entomol Soc Am*, 54, 416-421, 1961. DOI: 10.1093/aesa/54.3.416
17. Saridomichelakis MN, Koutinas AF, Gioulekas D, Leonidas L, Polyzopoulou Z: Sensitization to dust mites in cats with *Otodectes cynotis* infestation. *Vet Dermatol*, 10, 89-94, 1999. DOI: 10.1046/j.1365-3164.1999.00135.x
18. Rodriguez-vivas RI, Ortega-pacheco A, Rosado-aguilar JA, Bolio GME: Factors affecting the prevalence of mange-mite infestations in stray dog of Yucatan, Mexico. *Vet Parasitol*, 115, 61-65, 2003. DOI: 10.1016/S0304-4017(03)00189-4
19. Roy J, Bédard C, Moreau M: Treatment of feline otitis externa due to *Otodectes cynotis* and complicated by secondary bacterial and fungal

infections with Oridermyl auricular ointment. *Can Vet J*, 52, 277-282, 2011.

20. Roy J, Bédard C, Moreau M, Sauvé F: Comparative short-term efficacy of Oridermyl® auricular ointment and Revolution® Selamectin spot-on against feline *O. cynotis* and its associated secondary otitis externa. *Can Vet J*, 53, 762-766, 2012.

21. Akucewich LH, Philman K, Clark A, Gillespie J, Kunkle G, Nicklin

CF, Greiner EC: Prevalence of ectoparasites in a population of feral cats from north central Florida during the summer. *Vet Parasitol*, 109, 129-139, 2002. DOI: 10.1016/S0304-4017(02)00205-4

22. Knaus M, Rapti D, Shukullari E, Kusi I, Postoli R, Xhaxhiu D, Silaghi C, Hamel D, Visser M, Winter R, Rehbein S: Characterisation of ecto- and endoparasites in domestic cats from Tirana, Albania. *Parasitol Res*, 113, 3361-71, 2014. DOI: 10.1007/s00436-014-3999-1