www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2021; SP-10(11): 956-959

www.thepharmajournal.com
Received: 27-09-2021
Accepted: 30-10-2021

Sunil Punia
Department of Veterinary Medicine, College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary & Animal Sciences, Hisar, Haryana, India

Tarun Kumar
Veterinary Clinical Complex, College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary & Animal Sciences, Hisar, Haryana, India

Maneesh Sharma
Veterinary Clinical Complex, College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary & Animal Sciences, Hisar, Haryana, India

Divya Agnihotri
Veterinary Clinical Complex, College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary & Animal Sciences, Hisar, Haryana, India

Corresponding Author
Sunil Punia
Department of Veterinary Medicine, College of Veterinary Sciences, Lala Lajpat Rai University of Veterinary & Animal Sciences, Hisar, Haryana, India

Ear mite (*Otodectes cynotis*) induced otitis externa complicated by secondary bacterial infection in Persian cats

Sunil Punia, Tarun Kumar, Maneesh Sharma and Divya Agnihotri

Abstract
Ear mite infestation is a common cause of otitis in cats. Ear mite induced otitis externa complicated with *Staphylococci* spp. and *E.Coli* was diagnosed in two Persian cats which were housed in same premises. For treatment, two doses of ivermectin @ 0.2 mg / Kg body weight were given subcutaneously at 15 days interval along with 0.3% gentamicin and 0.3% moxifloxacin otic drops (as per culture sensitivity reports of individual case) for five days after cleaning ear with 2% Salicylic acid ear drops. After three days of treatment, clinical symptoms disappeared. No agents of *Otodectes cynotis* were identified by microscopic examination on seventh and fourteenth day post treatment.

Keywords: Otitis, *Otodectis cyanotis*, secondary bacterial infection, otic drops

Introduction
Otitis is defined as inflammation of the ear. Otitis externa is a term used when only the external canal, outside of the tympanic membrane, is involved. Ear mites are the most common cause of ear infections and health care problems in cats (Akucewich *et al.*, 2002) [2]. Feline otitis is a multifactorial and challenging clinical problem. Predisposing factors includes high-humidity environments and frequently bathing. Cats, especially Persians and Siamese cats, have excessively ceruminous ears and hence are more at risk. *Otodectes cynotis* is thought to be responsible for 50% or more of feline otitis externa cases (Griffin, 1993) [11]. Clinical signs include erythema, increased discharges or desquamation of the epithelium and pain or pruritus. Cats with infested ears show pruritus in 41.5% of cases and abnormal auricular secretions in 85.4% of cases (Sotiraki *et al.*, 2001) [25]. In cats ear mite infection is commonly caused by *Otodectes cynotis* (picker of the ear), *Cheyletiella blakei* (walking dandruff) and *Notoedres cati* (face mange) (Dryden and Payne, 2005) [7]. *Otodectes cynotis* commonly known as ear mite is non– burrowing, white and very active parasite belongs to the member of *Psorptidae* family and the most common cause of ear infection in cats while it is less common in dogs (Maazi *et al.*, 2010) [17]. They are highly contagious and can infest several species of animals (Scott *et al.*, 2001). The host's range of this highly contagious mite is wide enough and includes cats, dogs, foxes, ferrets and infrequently in humans (Wiwanitkit, 2011) [27]. The cat plays a vital role in transmission of ear mite in adult dogs, rabbit and ferret (Sasikala *et al.*, 2011) [22]. The mechanical irritation caused by the presence of the mites inside the ears may lead to a higher activity of ceruminal glands and, consequently, the establishment of a favorable environment for secondary infections by bacteria or fungi (August, 1988) [3]. The infestation is named otodectic mange (Sweatman, 1958) [26]. Secondary bacterial (mainly *Staphylococci* spp.) and fungal (*Malassezia* spp.) infections are also very common in cats affected by the ear mite as being most frequently isolated microorganisms in such cases (Roy *et al.*, 2011) [19]. All cats infested with ear mites will not display symptoms of ear mites but often they will scratch at their ears or shake their heads (Wiwanitkit, 2012) [28]. Diagnosis is mainly done by physical examination of the ear and microscopic examination of ear discharge. The present study describes the clinicopathological diagnosis and successful therapeutic management of ear mite in cats.

Material and Methods
A three month old white Persian female cat and a two and half month old black Persian male cat were presented to the Department of Veterinary Clinical Complex of the University at one month interval, with a history of head shaking and ear scratching.

Clinical examination revealed bilateral excessive dark brown ceruminous exudates loosely attached to the inner surface of pinnae and almost completely clogging the ear canal. History revealed that both the pets were housed in same premises. A very offensive odor was present in the ear. The ear discharge was collected by sterile cotton swabs and smears were made for microscopic examination. Bacteriological culture and culture sensitivity was also done.

Results and Discussion

The present study describes the clinical findings, diagnosis and therapeutic management of *Otodectes cynotis* in cats. Microscopically, ear exudate revealed adult parasites of *Otodectes* spp. along with their ova. Bacteriological culture was done to find out causative agent for secondary bacterial infection and culture sensitivity test was done. Thus, on the basis of history, clinical manifestations and evidence of parasites in ear exudate, both the cats were diagnosed to be having ear mite infection. Ear wax, collected by sterile cotton swab when examined under microscope (40X) revealed 3-4 adults mites per field along with 2-3 eggs per field. Bacterial culture yielded *Staphylococcus* spp. infection in both ears of one cat while other cat was suffering from infection with *E.coli* in left ear and *Staphylococcus* spp. in right ear. Culture sensitivity reports are shown in Table 1. Staphylococci were the bacteria isolated from both the cats ears infested with *O. cynotis;* which is consistent with previous reports on cats suffering from otitis externa (Hariharan *et al*., 2006) [13]. Both the cats presented were young and aged between 2.5 months to 3 months age. Lefkaditis *et al*. (2009) [15] described more susceptibility in kitten between 3-6 months of age.

Table 1: Cultural reports of Ear swabs collected from both the cats

Parameter	Cat A	Cat B
Age	3 months	2.5 months
Sex	Female	Male
Breed	White Persian	Black Persian
Secondary bacterial infection	Right ear - *Staphylococcus* spp. Left ear – *E. coli*	Right and left ear - *Staphylococcus* spp.
Bacterial isolate sensitivity	Tobramycin, Gentamcin	Cephalexin, Moxifloxacin, Ampicillin, Amikacin, Cloxacillin, Cefoperazone
Bacterial isolate resistance	Cephalexin, Moxifloxacin, Ampicillin, Amikacin, Cloxacillin, Cefoperazone, Enrofloxacin, Penicillin G, Carbenicillin, Streptomycin, Amoxycillin, Ciprofloxacin, Norfloxacin, Cloramphenicol, Kanamycin, Ceftriaxone, Levofloxacin, Cefotaxime, Neomycin	Enrofloxacin, Penicillin G, Carbenicillin, Streptomycin, Amoxycillin, Ciprofloxacin, Norfloxacin, Cloramphenicol, Kanamycin, Ceftriaxone, Levofloxacin, Cefotaxime, Neomycin, Tobramycin, Gentamcin

The cats were treated with two injections of ivermectin (200 µg/kg b.m. s/c) at a 15 day interval. Ears were cleaned with 2% Salicylic acid and then otic drops containing 0.3% Gentamicin and 0.3% Moxifloxacin, was instilled three times a day for five days in Cats A and B respectively. Clinical signs disappeared three days after treatment. Following seven and fourteen days post therapy cat ear became normal without exudation and irritation. No parasite was identified on re–examination of ear swabs. Moxidectin was used for treatment of ear mites by Fourie *et al.* (2003) [9], Lefkaditis and Koukeri (2007) [16], Farkas *et al.* (2007) [8], Davis *et al.* (2007) [6] and Ahn *et al.* (2013) [1] and reported efficacy varing from 80% to 100%. Selamectin was reported to be 96% to 100 % successful in treatment of ear mites by Six *et al.* (2000) [24], Shanks *et al.* (2000) [23], Blot *et al.* (2003) [5], Beck (2010) [4], Roy *et al.* (2012) [20] and Ozkan *et al.* (2013) [18]. Doramectin was found to be 90% efficacious in treating ear mites by Salib and Baraka (2011) [21]. Ivermectin by S/C route was found to be 75% to 100% successful in treating ear mites by Gram *et al.* (1994) [10], Kavitha *et al.* (2013) [14] and Hamed *et al.* (2015) [12].

Fig 1: Excessive dark brown cerucminous exudates in ears

Fig 2: Adult otodectis cyanotis under microscope

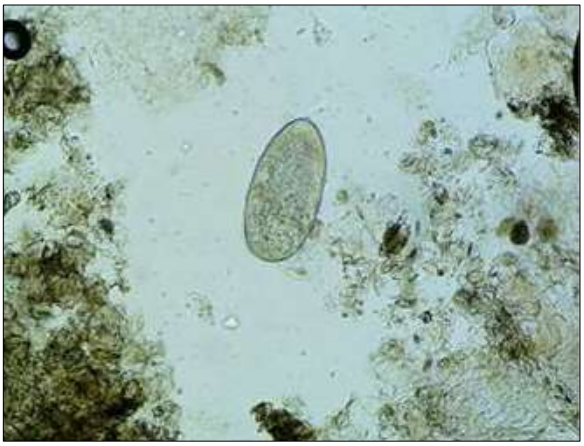

Fig 3: Egg of otodectes mite

Fig 4: Cat after recovery having clear ear

From the present study, it may be concluded that *Otodectes* can be transmitted from one cat to another cat, if they are kept in close premises. Cats of younger age are more affected than adult one with ivermectin still the effective drug in controlling ear mite without any detrimental effect.

References

1. Ahn AJ, Oh DS, Ahn KS, Shin SS. First feline case of otodectosis in the Republic of Korea and successful treatment with imidacloprid/moxidectin topical solution. Korean J. Parasitol 2013;51:125-128.
2. Akucewich LH, Kendra P, Clark A, Gillespie J, Kunkle G, Nicklin CF, *et al*. Prevalence of ectoparasites in a population of feral cats from north central Florida during the summer. Vet. Parasitol 2002;109(1-2):129-139.
3. August JR. Otitis externa, a disease of multifactorial etiology. Vet. Clin. Nort. Am. Small Anim. Pract 1988;18:731-742.
4. Beck W. Field study on the treatment of the feline ear canker caused by *Otodectes cynotis* with selamectin (Stronghold) [In German]. Wien Klin Wochenschr 2010;122:76-80.
5. Blot C, Kodjo A, Reynaud MC, Bourdoiseau G. Efficacy of selamectin administered topically in the treatment of feline otoacariosis. Vet Parasitol 2003;112:241-247.
6. Davis WL, Arther RG, Settje TS. Clinical evaluation of the efficacy and safety of topically applied imidacloprid plus moxidectin against ear mites (*Otodectes cynotis*) in client-owned cats. Parasitol Res 2007;101:S19-S24.
7. Dryden MW, Payne PA. Preventing Parasites in Cats. Vet. Ther 2005;6(3):260-267.
8. Farkas R, Germann T, Szeidemann Z. Assessment of the ear mite (*Otodectes cynotis*) infestation and the efficacy of an imidacloprid plus moxidectin combination in the treatment of otoacariosis in a Hungarian cat shelter. Parasitol Res 2007;101:S35-S44.
9. Fourie LJ, Kok DJ, Heine J. Evaluation of the efficacy of an imidacloprid 10%/moxidectin 1% spot-on against *Otodectes cynotis* in cats. Parasitol Res 2003;90:S112-S113.
10. Gram D, Payton AJ, Gerig TM, Bevier DE. Treating ear mites in cats: a comparison of subcutaneous and topical ivermectin. Vet Med 1994;89:1122-1125.
11. Griffin CE. Otitis externa and otitis media. In: Griffin C.E., Kwochka K.W., MacDonald J.M., editors. Current Veterinary Dermatology: The Science and Art of Therapy. St. Louis, Missouri: Mosby Year Book 1993, 245-262.
12. Hamed MI, Sayed RK, Waly NE. Evaluation of the clinical efficacy of three medications used for treatment of earmite-induced otitis externa in cats: a preliminary study. Assiut Vet Med J 2015;61:1-9.
13. Hariharan H, Coles M, Poole D, Lund L, Page R. Update on antimicrobial susceptibilities of bacterial isolates from canine and feline otitis externa. Can Vet J.2006;47:253-255.
14. Kavitha S, Venkatesan M, Nagarajan B, Thirunavukkarasu PS, Nambi AP. Clinical management of feline otodectosis: A study of 11 patients. Intas Polivet 2013;14:331-332.
15. Lefkaditis MA, Koukeri SE, Mihalca AD. Prevalence and intensity of Otodectes cynotis in kittens from Thessaloniki area, Greece. Vet. Parasitol 2009;163:374-375
16. Lefkaditis MA, Koukeri SE. A study on the treatment and the prevention of cat ear mite Otodectes cynotis using imedaclopride 10% and moxydectine 1% spot on drops. Bull Univ Agric Sci Vet Med Cluj-Napoca Hortic 2007;64:464–467.
17. Maazi N, Jamshidi SH, Hadadzadeh HR. Ear Mite Infestation in Four Imported Dogs from Thailand; a Case Report. Iran J. Arthropod–Borne Dis 2010;4(2):68-71.
18. Ozkan C, Karaca M, Ozdal N. Topical selamectin treatment of Otodectes cynotis in Van cats. [In Turkish]. Turkiye Parazitol Derg 2013;37:269-272.
19. Roy J, Bedard C, Moreau M, Sauve F. Treatment of feline otitis externa due to Otodectes cynotis and

complicated by secondary bacterial and fungal infections with Oridermyl® auricular ointment. Can. Vet. J 2011;52:277-282.
20. Roy J, Bedard C, Moreau M. Comparative short-term efficacy of Oridermyl auricular ointment and Revolution selamectin spot-on against feline Otodectes cynotis and its associated secondary otitis externa. Can Vet J 2012;53:762-766.
21. Salib FA, Baraka TA. Epidemiology, genetic divergence and acaricides of Otodectes cynotis in cats and dogs. Vet World 2011;4:109-112.
22. Sasikala V, Saravanan M, Ranjithkumar M, Sarma K, and Vijayakaran K. Management of ear mites in cats. Indian Pet J. 2011;11:5-9.
23. Shanks DJ, McTier TL, Rowan TG, Watson P, Thomas CA, Bowman DD, *et al*. The efficacy of selamectin in the treatment of naturally acquired aural infestations of Otodectes cynotis on dogs and cats. Vet Parasitol 2000;91:283-290.
24. Six R, Clemence R, Thomas C, Behan S. Efficacy and safety of selamectin against *Sarcoptes scabiei* on dogs and *Otodectes cynotis* on dogs and cats presented as veterinary patients. Vet Parasitol 2000;91:291-309.
25. Sotiraki ST, Koutinas AF, Leontides LS, Adamama-Moraitou KK, Himonas CA. Factors affecting the frequency of ear canal and face infestation by *Otodectes cynotis* in the cat. Vet Parasitol 2001;96:309-315.
26. Sweatman GK. Biology of *Otodectes cynotis*, the ear canker mite of carnivores. Can. J. Zool 1958;36:849-862.
27. Wiwanitkit V. Dog ear mite infestation: a possible problem in public health system. Iran J. Arthropod–Borne Dis 2011;5(2):1.
28. Wiwanitkit V. Role of Molecular Diagnosis for Dog Ear Mite Infestation. Int. J. Mol. Vet. Res 2012;2(2):6-7.