

A STUDY ON THE TREATMENT AND THE PREVENTION OF CAT EAR MITE *OTODECTES CYNOTIS* USING IMEDACLOPRIDE 10% AND MOXYDECTINE 1% SPOT ON DROPS

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Abstract. The aim of this study was to record the efficacy of a 10% imidacloprid plus 1.0% moxidectin spot-on combination in the treatment and the prevention of otoacariasis in naturally infested cats. The results have shown that the efficacy of a single treatment with the imidacloprid/moxidectin combination spot-on in cat was 99.02 % on day 14 and 98.86% two weeks later, on day 28 against *O. cynotis*.

INTRODUCTION

The ear mite *Otodectes cynotis* is one of the main primary causes of otitis externa in the cat who lives mainly the skin of the outer ear canal and inside the pinna. It is a mite of the family Psoroptidae and is estimated to be responsible for 50% of the canker cases worldwide (Sotiraki et al, 2001) and it has been estimated that over of 85% of cases of otitis externa in cats involve infestations with *Otodectes* (Wall et al, 2001).

Not all cats will display symptoms of ear mites but often they will scratch at their ears or shake their heads. Other symptoms may include reddish/brown discharge in the ear, bleeding from the ear, coffee-grounds like appearance in the ear, scratch marks, odour. There may be damage to the ear if the infection has been present for a length of time. Damage to the ear could include a thickening of the skin or infection which is caused by the cat damaging the skin by scratching, and bacteria entering these wounds. Ear mites are extremely contagious and are passed from cat to cat (Bowman et al, 2002).

MATERIALS AND METHODS

The aim of this study was to evaluate the efficacy of a 10% imidacloprid plus 1.0% moxidectin spot-on combination in the treatment and the prevention of otoacariasis in naturally infested cats.

Two groups of naturally infested 20 team living cats with *O. cynotis* were investigated. Group 1, consists randomly of 12 team living infested cats from a house that is located in a suburb of Thessaloniki, named Thermi. Group 2, consists of 8 team living naturally infested cats from the same house. Those naturally infested animals were from different breeds and age and kept indoors, where they have the ability of a close contact with each other. Most cats were neutered but others not. The owner mentioned that some cats had been restless, shaking their heads, scratching their ears several times a day.

The clinical examination and sampling from the ears were performed in all 20 infested cats. Bilateral otoscopic examination was performed to observe any motile ear mites and samples were taken with cotton-tipped swabs from both ears of each animal. The swabs were inserted deep into the external ear canal and a circular motion was used to collect samples.

The samples were checked immediately at the site for the presence of *O. cynotis* (adults, larvae, nymphs and eggs) under a dissecting microscope. The presence of even one mite, in any development stage, was deemed to have been a positive result.

Treatment with imidacloprid/moxidectin spot-on was performing according to the manufacture instructions in all 12 infected cats of the treatment group1. A brief description of the cats' sex, approximate age, was recorded. These animals had not received any systemic or aural ectoparasiticide for at least eight weeks prior to enrolment. Group2 of eight cats was the untreated control group.

The test product spot-on was administered as a single treatment according to the bodyweight of cats (provided minimum doses of 10 mg/kg body weight of imidacloprid and 1 mg/kg body weight of moxidectin, which is equivalent to 0.1 ml/kg of the spot-on solution for cats) on day 0 in all infested cats of group 1, and was applied to the base of the neck in front of the shoulder blades. In all infested cats consist group 2 none ectoparasiticide treatment was administrated. After the individual treatments, the cats were kept amongst the other cats. During the study, cats could not be treated with concurrent medications and ear cleaning was not allowed in any treated and untreated animal because of the potential to remove mites. Clinical inspections, including direct and otoscopic examination of the ear canals and sampling for checking the presence or absence of ear mites by microscopic examination of aural debris, were performed on days 14 and 28 on the treated cats. The untreated control animals were also evaluated with the same methods.

Data were compared by using T-student test, and differences were regarded significant when $P \leq 0.05$.

Table 1. Examined cats

Group 1	Group 2
12 cats	8 cats

RESULTS AND DISCUSSION

All examined cats were identified to be infected with *O. cynotis* on the day 0 of the study with mean number of ear mites 71.4 and 78.9 mites for group 1 and group 2 respectively.

Direct and otoscopic examination day 14 and 28, of both ears of treated animals (group 1) records mean number 0.7 and 0.9 respectively.(Table 2)

Direct and otoscopic examination day 14 and 28, of both ears of untreated animals (group 2) reveal higher mean number of ear mites 82.6 and 85.2, respectively.

The efficacy of a single treatment with the imidacloprid/moxidectin combination spot-on was 99.02 % on day 14 and 98.86% two weeks later, on day 28 against *O. cynotis*.(Table 2)

Table 2. Mean number of ear mites (*O.cynotis*) and efficacy of treatment of group 1

Day	0	14	28
Mean number of ear mites	71.4	0.7	0.9
Efficacy	-	99.02%	98.86%

This study has record that the efficacy of a single treatment with the imidacloprid/moxidectin combination spot-on was 99.02 % on day 14 and 98.86% two weeks

later, on day 28 against *O. cynotis* in cats. Farkas et al (2007) refer 100% efficacy the day 16 and 30 of their study. Fourie et al (2003) refer that A single treatment with the Imidacloprid / Moxidectin solution resulted in a treatment success rate (cure rate) of 80% 50 days after treatment. Two treatments with the Imidacloprid / Moxidectin solution, four weeks apart, cured all cats of *O. cynotis* infestation on assessment 22 days after the second treatment.

There are a number of approved medications for ear mites. Most of these products can be applied directly into the external ear canal once or twice daily for up to four weeks (Curtis 2004). This method is very tedious and demanding for the owner, plus it often causes pain and discomfort for the animal. Therefore, spot-on applied to the skin only monthly offer more practical control measures against *O. cynotis* without cleaning of the ears, treating the hair coat and the cat's environment and, in most cases, without the concurrent use of antimicrobial drugs (Six et al. 2000, Shanks et al. 2000).

These recorded results indicate that the acaricide efficacy persisted for about a month. It is related to the long elimination half-life of moxidectin, which is longer than other approved macrocyclic lactones.

Statistical analysis of this research has shown no significant difference in prevalence in young cats or older cat and between male and female cats. Sotiraki et al. (2001) also record that no connections were observed between infestation and age, or sexual activity of infested cats.

Moxidectin interacts with GABA and glutamate-gated chloride channels. This leads to opening of the chloride channels on the postsynaptic junction, the inflow of chloride ions and induction of an irreversible resting state. The result is flaccid paralysis of affected parasites, followed by their death and/or expulsion, also is active against many internal and external parasites such as fleas, lice, heartworm (*Dirofilaria immitis*), roundworm (*Toxocara cati*) and hookworm (*Ancylostoma tubaeforme*) (Reinemeyer and Charles 2003, Arther et al. 2005, European Medicines Agency 2005).

CONCLUSIONS

This study has record that the efficacy of a single treatment with the imidacloprid/moxidectin combination spot-on in cats, was 99.02 % on day 14 and 98.86% two weeks later, on day 28 against *O. cynotis*.

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