



RESEARCH ARTICLE

Use of Fluralaner on 4 Dogs with Trombiculosis

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Abstract

Trombiculosis is a parasitic dermatosis. The objective was to report the treatment with fluralaner in four schnauzer dogs with trombiculosis. A single oral dose of fluralaner was administered at 25 mg/kg body weight. Evaluations of pruritus, lesions, and the presence of live mites were performed at 13, 28, and 60 days post-treatment. From day 13 after treatment, microscopic skin observations of all dogs were negative for the presence of mites, continuing until the end of the study (day 60). Significant decreases in itching were observed from day 13, progressively decreasing to 0 on day 60. The lesion score between day one and day 13 decreased significantly, while on the other days of evaluation, the improvement in lesions was only observed numerically in the score reaching 0. Fluralaner administered in a single dose showed efficacy in eliminating chigger mites at 13 days, thus significantly resolving clinical signs associated with trombiculosis.

Key words: Dogs, fluralaner, *Neotrombicula autumnalis*, mites, treatment, isoxazolines

Introduction

Trombiculids, also known as crop mites or chigger mites, are ectoparasites that cause a form of dermatosis known as trombiculosis. They are capable of feeding on virtually all species of domestic animals, birds, reptiles, and humans [1, 3]. *Neotrombicula autumnalis*, a small orange-red mite approximately 250-750 µm long, is considered the most common causative agent in Europe [1, 2]. Only the larval (six-legged) stages of these mites include parasitic behavior, the other octopod stages (nymphs and adults) are free-living. After the larva hatches from the egg in the environment, it will climb to any suitable warm-blooded host to feed on the blood and digested dermal tissues [3, 4]. Clinical signs in infested animals may include macular erythema, papules, vesicles, hives, scales, and scabs, usually accompanied by itching in areas such as the head, ears, ventral abdomen, perineum, and legs [5]. These are also potential vectors of infectious diseases [1]. The diagnosis can be made based on medical history, clinical signs, macroscopic, and microscopic observation of the larval mites [3]. Isoxazolines are insecticide-acaricide molecules that act on the insect receptor γ -aminobutyric (GABA) and glutamate receptors, that are highly effective against various ectoparasites [6]. In the evaluation of the insecticide and acaricide potency of fluralaner, fipronil, dieldrin, imidacloprid and deltamethrin with four insect species and three tick species, fluralaner proved to be more potent in most trials than

the other insecticides/acaricides [7]. Therefore, the objective of this work was to report the efficacy of fluralaner in dogs with trombiculosis.

Cases Presentation

From September to November 2019, four privately-owned schnauzer dogs, two females and two males, ranging in weight from 8 to 12 kg and with an average age of 5 years, were included with a clinical diagnosis of trombiculosis by superficial skin scrapings. The dogs lived in different houses, but within the same geographical area, none of the dogs had had previous topical or systemic treatment. During the treatment period, each dog remained in standard conditions in its home, consuming its regular diet. No prescription foods, medications, or supplements were allowed during the treatment period. All dogs were evaluated, for clinical signs of trombiculosis disease (erythema, papules, vesicles, hives, scales, and scabs) [4], focusing on areas such as the head, neck, ears, ventral abdomen, forelegs, and hind legs, perineum and tail. Previously reported analogous scales were used to assess the severity of lesions and itching [8, 9]. For each area

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and clinical sign, an unvalidated scoring system was used with values of 0 (none), 1 (light), 3 (moderate) or 6 (severe) assigned for seven different lesions sites (42 points maximum) in 14 body areas (maximum value of 588 points). The severity of the pruritus was evaluated using a previously validated scoring system, that combined features of the behavior and severity-based scales with the visual analogue scale [9].

The diagnosis was made by a superficial skin scraping, which consisted of taking samples by removing the hair from areas with lesions and placing mineral oil, on a slide for microscopic evaluation, the parasitic forms correspond to *Neotrombicula autumnalis* [2]. The dermatological lesion score, pruritus assessments and skin scrapings were repeated on 13, 28, and 60 days; the data were recorded as the presence or absence of live mites.

On day 1, the dogs were treated orally with a single dose of fluralaner chewable tablets (Bravecto, MSD Animal Health Merck & Co. Inc). The dose was based on individual weight to achieve a minimum dose of 25 mg/kg body weight. The tablets were administered directly into the oral cavity 20 minutes after feeding. A paired means comparison test was applied to compare the post-treatment week assessments of patient lesion scores and itching scales using JMP 8.0 statistical software.

Results

The comparison in the itching scale at the beginning of the study was an average of 8.5, and the second evaluation decreased to 2.5 presenting a significant difference ($p=0.005$). A comparison between the beginning and the third evaluation (day 28) demonstrated a decrease in the itching scale to “1,” showing a significant difference ($p=0.0006$). The comparison between the initial and final evaluation (day 60) also presented a significant difference ($p=0.0004$), reaching a score of “0” showed a sustained effect of the treatment. The lesion score between the beginning and the second evaluation decreased significantly ($p=0.03$). The comparisons of the beginning and days 28 and 60 did not present a significant difference. However, numerically the lesion score decreased showing a trend ($p=0.06$) and reaching 0 at the end of the study. From day 13 post treatment, the proportion of infected dogs for *Neotrombicula autumnalis* decreased to 0. The percentage reduction was 100%, remaining so throughout the study, showing a sustained effect of the treatment.

Discussion

It has been mentioned that due to the life cycle of the parasite, control and prevention can be difficult [1]. In the present study, antiparasitic efficacy from day 13 (100%) was accompanied by a significant improvement in the scale of itching on days 13 (2.5), 28 (1), and 60 (0). Similarly, the severity of the lesions decreased, showing a sustained effect of the treatment. Fipronil has been used topically as a spot-on in a dog and cat with infestations by *Neotrombicula autumnalis* larvae, obtaining the resolution of the skin lesions after two weeks,

however, no further information is provided on the efficacy of this product [5]. In contrast, its use in spray has also shown efficacy and has been recommended monthly, and in some cases, additional local treatments every 14 days [10]. Fipronil has also been used in combination with permethrin in a spot-on formulation applied twice at an interval of two weeks. However, an acaricidal efficacy (97%) similar to this study was obtained up to day 28 [1, 11]. Small et al. (2004) also obtained an efficacy of 98.8% up to 3 weeks after two applications of permethrin-pyriproxyfen spray or line-on. While a single oral administration of chewable fluralaner tablets was sufficient to eliminate the infestation, which in addition to benefiting the patient, could be more comfortable for the owner by administering fewer treatments.

Although initial treatment may be uncertainly easy, reinfestation is a problem. Fluralaner treatment can be an effective measure to prevent reinfestation. Since during the study time no environmental restriction was practiced and the dogs were presumably exposed to reinfestation by *Neotrombicula autumnalis*. In cats, several treatments have been used, such as ivermectin 1%, thiabendazole 4%, fipronil spray 0.25%, and selamectin spot-on, or moxidectin combined with imidacloprid. However, when re-evaluating some of the cats after treatment with one of these drugs, orange-colored granules were found to appear in the body [3]. Fluralaner was administered as a last resort after several treatments on two cats, eliminating the infestation four months after the initial treatment [4]. Even with this; studies are required to confirm that fluralaner can do the same with chigger mites, considering that this parasite can have a variety of clinical digestive, systemic as well as neurological signs that are usually severe [12]. Although the authors were unable to include an untreated control group in this study, treatment was necessary in these dogs to eliminate the infestation and thus the potential irritation caused and to prevent possible transmission of pathogens. Further studies are required to fully assess the potential benefit provided by the use of isoxazolines (fluralaner) in trombiculid infestations.

Conclusion

Fluralaner showed 100% efficacy in eliminating trombiculid infestations (*Neotrombicula autumnalis*) in dogs, thus obtaining a significant improvement in lesions and itching within 60 days evaluated.

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