Study on the efficacy of the treatment protocol of 25 cases of pyodermodecosis, with Ivermectin, Amitraz, and Trimethoprim-sulfadiazine

A.M. LEFKADITIS

Veterinary Clinic Thessaloniki, Grecia

ABSTRACT. The combined therapy with Ivermectin, Amitraz, and Trimethoprim-sulfadiazine on 30 dogs with Pyodermodecosis was successful in the 29/30 dogs (percentage 96.67%).

Introduction

Demodicosis, or red mange, is a common skin disease of dogs caused by a microscopic mite called Demodex canis. These mites are part of the normal flora of the skin, and are present in small numbers, so the disease is not contagious. In predisposed individuals the mites increase in number causing clinical disease.

Secondary bacterial infection of the hair follicles often occurs, and rupture of the hair follicle wall may lead to the presence of free mites in the dermis, and a severe pyogenic infection.

The knowledge for the correct and no expensive treatment is very useful for the clinician in order to choose the protocol of treatment for the solution of the health problem of his clients.

Materials and methods

In this study of 30 cases of dogs with adult-onset pyodermodecosis are investigated. From the 30 dogs, the 18 were male and the 12 female. Most of them, particularly 24 were pure-breed and 6 mixed-breed. The age of the dogs ranged from 8 months to 11 years (mostly young adult dogs).

The diagnosis is made by demonstration of the mites by skin scraping. Occasional mites are found in normal skin, but the presence of several Demodex, and particularly the presence of young forms and eggs, enable confirmation of the diagnosis. The performance of the skin scraping as follow, some 3-5 sites are selected for skin scraping then the hair, if present, is clipped. The skin is gently squeezed between thumb and forefinger to force the mites more superficially in the hair follicle. The skin is moistened with liquid paraffin or mineral oil and some is also placed on the slide. The skin is then scraped using a blunted scalpel blade until capillary bleeding is observed and the material is then transferred to the slide. Finally the entire slide is scanned using the 10X objective and focus on suspicious areas using the 40X objective if necessary. The proportion of live and dead mites, of adult and young forms and of eggs should be recorded.

Staphylococcus intermedius, isolated by cytology culture using the Dip Quick Stain Kit

No clinical or laboratory findings in all 30 dogs for lymphoma, hyperadrenocorticism, or hypothyroidism were noted.

In those 30 dogs, ivermectin was given at the dose of 300µg/kg subcutaneous every two weeks for a total of four treatments.

Trimethoprim-sulfadiazine 30mg/kg bid for two months was given in all 30 dogs.

Also Amitraz (Taktic) was given with application topically of the 0.05% solution weekly for 6 weeks.
Results and discussion

From the 30 dogs, the 29 (percentage 96.67%) were totally cured and one dog cured only for demodecosis but is not cured for bacterial infection of *Staphylococcus intermedius*.

Ivermectin's mechanism of action is that of all the macrocyclic lactones (Shoop et al, 1995). It causes the opening of chloride channels by binding the glutamate-gated channels. GABA-gated sites may be also potentiated. Chloride ions cause a slight hyperpolarization of the resting potential postsynaptic cells. Ivermectin enhances the release of GABA at presynaptic neurons. GABA acts as an inhibitory neurotransmitter and blocks the post-synaptic stimulation of the adjacent neuron in nematodes or the muscle fiber of the arthropods. By stimulating the release of GABA, ivermectin causes paralysis of the parasite and its eventual death (Bennet, 1986; Campel, 1989).

In dogs, ivermectin is used as a microfilariocide, ectoparasiticide and as a preventative for heartworm (Shoop et al, 1995). The target parasites are *Toxocara canis*, *Toxascaris leonina*, *Ancylostoma caninum*, *Uncinaria stenocephala*, *Trichuris vulpis*, Carillaria aerophila, Filaroides osleri, *Strongyloides stercoralis*, *Dirofilaria immitis* larvae, and arthropods.

Experimental studies indicate that when the drug is used at high doses it has a wider spectrum of activity. Both fourth-stage larvae and adult parasites are eliminated by single SC doses of 0,05mg/kg (*Ancylostoma caninum*, *Uncinaria stenocephala*), 0,1 mg/kg (*Trichuris vulpis*), or 0,2mg/kg (*Toxocara canis*). Following SC administration at a dose of 0,2mg/kg the efficacy of the drug against *Toxascaris leonina* is only 69%, while oral administration at the same dose improves the efficacy to above 95%. Oral or SC administration of ivermectin at 0,2mg/kg twice, 2 weeks apart, is reported to be 95-100% effective against intestinal stages (but not third–stage parenteral larvae) of *Strongyloides stercoralis* (Paul, 1989). Ivermectin is effective against *Spirocerca lupi* (Lefkaditis, 2002).

In dogs up to 95% of ivermectin administered orally is absorbed (Paul, 1989).

While there is a greater bioavailability after SC administration, absorption after oral dosing is more rapid than that seen after use of the SC route.

Ivermectin is well distributed to most tissues, but does not readily penetrate into the CNS, thereby minimizing its toxicity. As previously mentioned, Collie breeds apparently allow more ivermectin into CNS than other breeds/species.

In dogs, the drug’s terminal half-life is as long as 2 days. It is metabolized in the liver via oxidative pathways and is primarily excreted in feces. Less than 5% of ivermectin is excreted in the urine as a parent compound or metabolites.

In dogs, symptoms of toxicity rarely occur at a single dosage of 2mg/kg or less. At a dose of 2,5mg/kg mydriasis occurs, and a dose of 5mg/kg causes tremors. At doses of 10mg/kg, severe tremors and ataxia are seen. Deaths occurred when dosages exceeded 40mg/kg, but the LD50 is 80mg/kg. Dogs receiving 0,5mg/kg PO for 14 weeks developed no signs of toxicity, but at 1-2mg/kg for the same time period, developed mydriasis and showed some weight loss. Half of the dogs receiving 2mg/kg/day for 14 weeks developed symptoms of depression, tremors, ataxia, anorexia and dehydration (Paul, 1989). There was no teratogenesis when ivermectin was administered to pregnant animals at four times the recommended dose (Paul, 1989).

The Collie breed appears to be more sensitive to the toxic effects of ivermectin than the other canine breeds (Upson, 1989). This may be due to a more permeable blood-brain barrier to the drug or drug accumulation in the CNS of this breed. For this reason, ivermectin should not be used in this breed, nor should it be used in mixed-breed dogs that appear to be part Collie.

Pyoderma is one of the most common causes and the most persistent of canine skin diseases worldwide (Ihrke 1987; Hill and Moriello 1994). Lesions may be quite superficial and affect only the epidermis or may involve deeper structures in the dermis or subcutaneous tissue. The primary pathogen of superficial pyoderma cases involve *Staphylococcus intermedius*, a member of the normal flora in most dogs (Noble and Kent 1992; Hill and Moriello 1994; Scott et al. 1994; Ihrke 1996; Scott et al. 1998). Also In therapy of canine pyoderma, the selected antibiotic should have good skin penetration and be active against *Staphylococcus* spp. (especially, *S. intermedius*).
In addition, the antibiotic selected depends on the type of infection, efficacy, and safety profile or recurrent or resistant superficial pyoderma (Bergan 1981; Ackerman 1987; Frank 1990).

In an attempt to increase the clinical efficacy of amitraz, unlicensed protocols have been developed involving more concentrated solutions of the drug applied more frequently. One study reported that improved success rates (78% vs 22%) were achieved by doubling the frequency of treatment to once weekly. In Europe, weekly applications of amitraz at concentrations of 500 to 1000 ppm were reported to be effective and safe in the treatment of CGD. Although results suggest that better cure rates may be achieved when twice the recommended frequency of application is used, it is not known if weekly treatment decreases the time needed for a cure. A cost-effective approach is to start with the licensed biweekly 250-ppm amitraz applications and switch to weekly treatment if mite counts do not decrease over the following 4 to 8 weeks. The most common side effects attributed to amitraz treatment in dogs are sedation, pruritus, and hypothermia. Other less common side effects, including anorexia, polyuria, polydipsia, bradycardia, hypotension, hyperglycemia, seizures, ataxia, and, rarely, death, have also been reported. Severe reactions or intoxication can be reversed with alpha₂ agonist inhibitors such as yohimbine or atipazole.

Conclusions

The treatment protocol with Ivermectin at the dose of 300µg/kg SQ every two weeks, Trimethoprim-sulfadiazine at the dose 30 mg/kg bid, Amitraz topically at the dose % solution weekly is effective on the Pyodemodecosis of the dog in a percentage 96.67%.

References