CASE REPORT
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TREATMENT OF NATURALLY ACQUIRED *STRONGYLOIDES STERCORALIS* INFECTION IN A DOG WITH IVERMECTIN

M. Yang[*], E. B. Gebeyehu[*], S. J. Jung[**], O. D. Kwon[*] and D. Kwak[****]

[*]College of Veterinary Medicine, Kyungpook National University, Daegu, South Korea
[**]Eujin Animal Clinic, Daegu, South Korea
[***]Cardiovascular Research Institute, Kyungpook National University, Daegu, South Korea
Corresponding author: dmkwak@knu.ac.kr

ABSTRACT

A six month old male Pomeranian weighing 1.1 kg was presented to a local animal clinic with symptoms of diarrohea, depression and emaciation. Faecal examinations, including direct smear and Baermann method, revealed that the dog was severely infected by a parasitic nematode, *Strongyloides stercoralis*, with a count of 1,200 larvae per gram of faeces. After confirmation, ivermectin (0.05 cc, 1% w/v) was administered subcutaneously. On the second visit after nine days of the first, no larva was detected under microscopy and improvement of body condition was observed with normal stool consistency and body weight of 1.4 kg. The dog was treated again with the same dose of ivermectin and scheduled for another visit in a week. On the third visit, the dog was negative for larval shedding, with normal stool consistency and a slight increase in body weight to 1.8 kg. The dog was scheduled for a final visit in two months to check re-infection; during this visit there were no parasite eggs or larvae and the clinical examination also revealed normal body condition and normal stool consistency with body weight of 3.5 kg, which is within normal range. Thus, the result in the present case suggests that ivermectin is suitable for treatment of dogs naturally infected by *S. stercoralis*.

Key words: *Strongyloides stercoralis*; dog; treatment; ivermectin.

INTRODUCTION

Strongyloides stercoralis, which is also called threadworm, is a parasitic nematode that can parasitize dogs, cats, man and other primates (Dillard *et al*., 2007). It is endemic in tropical and subtropical regions and less prevalent in temperate areas (Overgaauw and van Knapen, 2000). Infection with *S. stercoralis* is a major problem to human health due to its zoonotic potential. In dogs, it is less common in adults than in puppies (Itoh *et al*., 2009). *S. stercoralis* infection is usually subclinical with few cases showing apparent clinical signs such as mild diarrohea, bronchopneumonia and weight loss (Robertson and Thompson, 2002). Puppies and immunocompromized animals with heavy burdens and disseminated infections may show acute diarrohea, weakness, emaciation and might also cause sudden death (Dillard *et al*., 2007).

The present study describes a successful treatment of *S. stercoralis* infection in a dog with ivermectin administered subcutaneously.

Case History: A six month old male Pomeranian weighing 1.1 kg was presented to a local animal clinic with symptoms of diarrohea, depression and emaciation. Faecal examinations, including direct faecal smear and Baermann method for larval count, revealed that the dog was severely infected by *S. stercoralis* with a count of 1,200 larvae per gram of faeces. Figure 1 shows the first stage larvae of *S. stercoralis* in fresh faeces using direct smear which have characteristics of a rhabditiform oesophagus with slight anterior and posterior swellings and sizes of 250–350 µm (Zajac and Conboy, 2006). After confirmation, ivermectin (0.05 cc, 1% w/v) was prescribed and administered subcutaneously and the owner was requested to revisit in nine days. On the second visit, no larva was detected under microscopy and improvement of body condition was observed with normal stool consistency and body weight of 1.4 kg. The dog was treated with the same dose of ivermectin and scheduled for the third visit in one week. On the third visit, the dog was negative for larval shedding, with normal stool consistency and a slight increase in body weight to 1.8 kg. After discussion with the owner, a final visit was scheduled in two months for checking re-infection. On the final visit, no parasite eggs or larvae were detected and the clinical examination also revealed normal body condition and normal stool consistency with body weight of 3.5 kg, which is within the normal range. The treatment and clinical follow-up are summarized in Table 1.

RESULTS AND DISCUSSION

The selection of ivermectin as a treatment of choice in the case presented was based on its excellent broad spectrum anti-parasitic activity though it has low safety margin (Hovda and Hooser, 2002; Itoh *et al*., 2009). In addition, it showed comparable and better rates

of larval clearance than thiabendazole and albendazole, respectively, and fewer and comparable side effects than thiabendazole and albendazole, respectively (Pacanowski *et al*., 2005). Ivermectin has been used successfully for the treatment of *S. stercoralis* infection in dogs, and excellent results obtained in cases given multiple treatments (Itoh *et al*., 2009).

Single subcutaneous dose of ivermectin (0.05 cc, 1% w/v) has been found to be effective in the current case with subsiding of symptoms and larvae disappearance on stool examination. This result was consistent with the previous study which reported 100% efficacy against L1, L2 and adults of *S. stercoralis* in dogs and comparable efficacy against L3 from the gastrointestinal tract, but it was not effective against tissue dwelling L3 (Mansfield and Schad, 1992). The same authors reported dogs with confirmed *S. stercoralis* infection treated with ivermectin or other drugs are not necessarily cleared of infection just because they cease to shed detectable numbers of larvae in the faeces. It could also be due to low sensitivity of Baermann technique. Hence, treatment was repeated to make sure that any remaining parasites were cleared and also to increase the effectiveness against tissue dwelling larvae (Dillard *et al*., 2007).

The effectiveness of eradicating the parasite with small number of treatments makes ivermectin more preferable compared to other antiparasitic drugs which has to be given more than three times (Itoh *et al*., 2009). Small number of treatments is required with ivermectin which are easily manageable and less stressful as compared to drugs with multiple administrations. Moreover, no adverse effects of ivermectin treatment were detected and this finding is in agreement with other (Mansfield and Schad, 1992). In conclusion, the present case report indicates that ivermectin is effective in naturally acquired *S. stercoralis* infections in dogs.

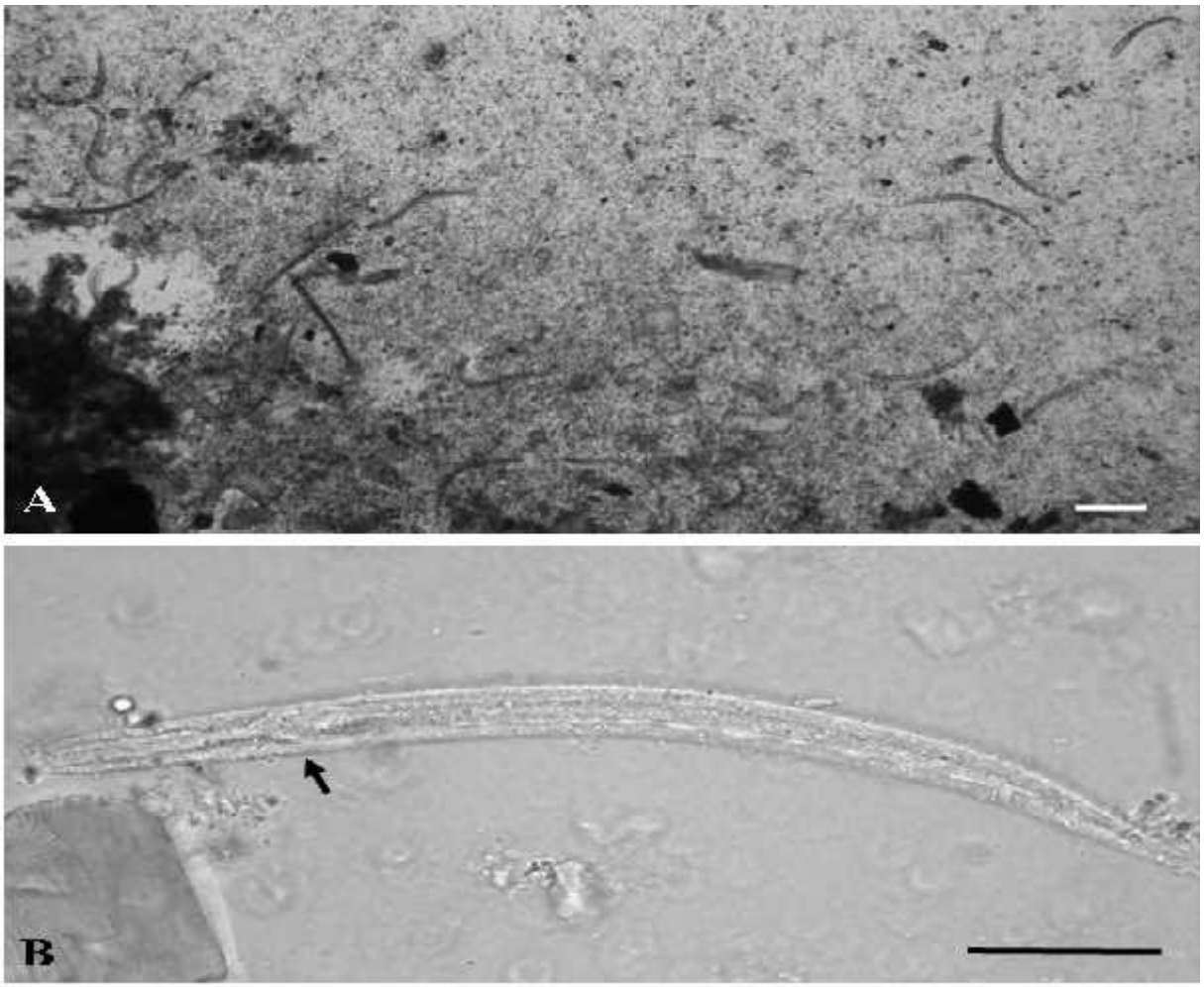

Fig. 1: Identification of the first stage larvae of *Strongyloides stercoralis* by faecal examinations of a six month old male Pomeranian dog. A, a low magnification (scale bar = 100 µm); B, a higher magnification of A (scale bar = 50 µm). The arrow indicates a rhabditiform oesophagus with slight anterior and posterior swellings.

Table 1: Treatment and clinical follow-up of a dog infected by *Strongyloides stercoralis*

Visit (Date)	1st (9/1)	2nd (9/10)	3rd (9/17)	4th (11/17)
Body weight (kg)	1.1	1.4	1.8	3.5
Clinical sign	diarrhea emaciation	normal stool underweight	normal stool underweight	normal stool normal body weight
LPG*	1,200	0	0	0
Treatment	Ivermectin**	Ivermectin**	No	No

*Larvae per gram of faeces
**Ivomec®, 0.05 cc S.C., 1% w/v (Merial Animal Health).

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