

Assessment of Imidacloprid/Moxidectin Treatment in Heartworm-Infected Dogs

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In the literature

Savadelis MD, Coleman AE, Rapoport GS, et al. Clinical assessment of heartworm-infected beagles treated with a combination of imidacloprid/moxidectin and doxycycline, or untreated. *J Vet Intern Med.* 2020;34(5):1734-1745.

FROM THE PAGE ...

Dirofilaria immitis, an etiologic agent of heartworm disease, contains an endosymbiotic bacterium of the genus *Wolbachia*, which produces a host inflammatory response when released on the death of the adult parasite. Treatment with doxycycline prior to heartworm adulticidal therapy eliminates *Wolbachia* spp from worms, diminishing associated inflammation and resulting pulmonary pathology. Coadministration of doxycycline with long-term macrocyclic lactone administration has been shown to be effective in slowly killing adult heartworms and eliminating microfilariae. Efficacy rates vary widely with the specific macrocyclic lactone, likely due to relative dosage rates.¹

In this study,* researchers surgically transplanted adult heartworms into 16 beagles; dogs were randomly assigned to treatment ($n = 8$) and nontreatment ($n = 8$) control groups. Four weeks after transplantation, the treatment group received topical 10% imidacloprid + 2.5% moxidectin at the standard dose, along with doxycycline (10 mg/kg PO every 12 hours). Doxycycline was given for 30 days, and imidacloprid/moxidectin was continued every 4 weeks for a total of 10 treatments. The control group received no treatment or placebo. Clinical data consisting of CBC, serum chemistry profile, radiography, and echocardiography were collected for all dogs ≈ 1 week before and 3 weeks after surgical transplantation of adult worms, as well as every 4 weeks for the duration of the treatment period.

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Serum ALT and ALP were significantly higher in treated dogs on day 28 as compared with untreated dogs; few other differences were found between the groups. Aside from significantly fewer treated dogs having echocardiographic evidence of adult heartworms at all time points, any differences were considered of minimal or indeterminate clinical relevance. On necropsy, dogs in the treatment group had significantly higher pulmonary arterial thrombus scores than the control group; however, pulmonary thromboembolism is an inevitable consequence of successful adulticide therapy. Authors concluded that this treatment protocol was well-tolerated with no clinically relevant adverse effects.

Pulmonary thromboembolism is an inevitable consequence of successful adulticide therapy.

... TO YOUR PATIENTS

Key pearls to put into practice:

- 1** The adulticidal efficacy of doxycycline and monthly imidacloprid/moxidectin therapy is 95.9%, which is comparable to the recommended standard adulticide therapy that consists of pretreatment with doxycycline and a select macrocyclic lactone followed by a 3-dose regimen of melarsomine.¹ Doxycycline and monthly imidacloprid/moxidectin therapy also successfully eliminated microfilariae within 3 weeks.
- 2** Results of this study suggest the risk for clinically relevant complications in dogs treated with doxycycline and monthly imidacloprid/moxidectin is comparable to that in nontreated dogs. Both groups had moderate exercise restrictions throughout the study; exercise restriction remains a vital component of adulticidal therapy regardless of protocol.
- 3** As compared with standard therapy, the slower time to effect of imidacloprid/moxidectin adulticide therapy causes a longer period of continued cardiopulmonary damage; thus, slow-kill adulticide methods are not recommended by the American Heartworm Society.² However, this protocol may be an acceptable alternative when melarsomine is not an option.

References

1. Savadelis MD, Ohmes CM, Hostetler JA, et al. Assessment of parasitological findings in heartworm-infected beagles treated with Advantage Multi for dogs (10% imidacloprid + 2.5% moxidectin) and doxycycline. *Parasit Vectors*. 2017;10:245.
2. American Heartworm Society. Prevention, diagnosis, and management of heartworm infection in Dogs. AHS website. <https://heartwormsociety.org/veterinary-resources/american-heartworm-society-guidelines>. Updated 2020. Accessed October 2020.

Suggested Reading

Companion Animal Parasite Council. CAPC guidelines for heartworm. CAPC website. <https://capcvet.org/guidelines/heartworm>. Updated July 2020. Accessed October 2020.