



THURSDAY, SEPTEMBER 4 • SESSION 2 DOXYCYCLINE AND WOLBACHIA

Efficacy of reduced doxycycline dosage on inflammatory and stress responses in dogs with heartworm disease

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Thursday | 10:30–10:45 AM

International heartworm guidelines recommend doxycycline at 10 mg/kg BID for 28–30 days to eliminate *Wolbachia pipientis*, a bacterium with a key pro-inflammatory role in heartworm disease. However, evidence suggests that lower doses may be sufficient. This study evaluated the efficacy of different doxycycline doses in 78 heartworm-infected dogs, divided into two groups: Group A (n=43) received 10 mg/kg BID, while Group B (n=35) received 5 mg/kg BID for 28–30 days. All dogs also received ivermectin (6–12 µg/kg) on day 1. Blood samples were collected at baseline (day 0) and after treatment (day 30) to measure C-reactive protein (CRP) and basal cortisol. Anti-rWSP antibodies were also analyzed using a non-commercial ELISA. At day 0, 59% of dogs had pathological cortisol levels (3.55 ± 3.24 µg/dL), and 51.3% had elevated CRP (41.66 ± 42.81 mg/L). By day 30, 52.6% still showed high cortisol (3.39 ± 2.22 µg/dL), while 21.8% had persistently elevated CRP (26.78 ± 32.65 mg/L). CRP and cortisol significantly decreased in both groups ($p < 0.05$), with no differences between treatments. There were no statistically significant differences in anti-rWSP antibody response between days 0 and 30 in either group. High baseline CRP confirmed the strong inflammatory response in heartworm infection, while elevated cortisol suggested stress, consistent with previous reports in animals and humans infected by other parasites. The reduction in CRP aligned with prior findings, likely reflecting *W. pipientis* elimination and its associated inflammatory response. Similar CRP decreases in both groups suggested that 5 mg/kg BID may be as ef-

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fective as 10 mg/kg BID in reducing *W. pipientis*. On day 30, cortisol levels decreased in both groups, likely due to the significant reduction of *W. pipientis*. However, a high percentage of dogs still exhibited elevated cortisol levels, which may be attributed to the persistence of vascular damage caused by adult parasites. Additionally, external factors such as handling stress and shelter conditions should also be considered. In conclusion, the studied biomarkers decreased in both groups, with no significant differences between doxycycline doses, suggesting that both regimens may have similar efficacy in reducing the *W. pipientis* population.

Effect of doxycycline on *Wolbachia* levels in *Dirofilaria immitis* worms from five canine heartworm cases: Immunohistochemical staining analysis

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Thursday | 10:45–11:00 AM

Doxycycline is an essential component of the adulticidal treatment for canine heartworm, as it targets the elimination of *Wolbachia pipientis*, an endosymbiotic bacterium whose release triggers a proinflammatory innate immune response in the host. Therefore, the effective eradication of *Wolbachia* is crucial before proceeding with adulticidal therapy. This study aimed to evaluate the effects of doxycycline administered at two different doses (10 mg/kg BID and 5 mg/kg BID) on *Wolbachia* levels in *Dirofilaria immitis* worms harvested from dogs undergoing surgical parasite removal. The study involved five infected dogs, all of which had a high parasite load or vena cava syndrome. Two dogs did not receive any antibiotic treatment prior to surgery, two received doxycycline at 5 mg/kg BID, and