



I-8. NEW BIOMARKERS IN HEARTWORM DISEASE

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Cardiorespiratory function in dogs infected with *Dirofilaria immitis* is routinely evaluated through tests such as radiography, echocardiography, and electrocardiography. However, serological biomarkers show that they can be a very useful tool in most cases, providing additional information to the clinical veterinarian. The most widely used biomarkers in small animals' cardiology are cardiac Troponin I (cTnI) and the N-terminal pro-B-type natriuretic peptide (NT-proBNP), which have also shown a great utility in the evaluation of heartworm disease. Numerous studies indicate that troponin I is significantly elevated in chronic infections when compared to dogs with recent infections, so its use has proven to be useful when evaluating chronicity, response to treatment, and myocardial damage caused by this infection. Similarly, it has been seen that NT-proBNP values increase in the most severe stages, and a relationship has been observed between the presence of pulmonary hypertension and pathological increases in NT-proBNP, so this biomarker could be useful to evaluate this condition, which is so frequent in canine heartworm. Similarly, it has been observed that endothelin-1 (ET-1) acts as a good marker to assess the presence and severity of pulmonary hypertension in dogs with *Dirofilaria immitis*. Moreover, in a recent study, it has been observed that this biomarker remains increased in dogs in which pulmonary hypertension persists several months after completion of adulticide treatment. Undoubtedly, D-dimer is another very useful biomarker in canine heartworm, since it helps in the detection of pulmonary thromboembolism, a very frequent phenomenon in this pathology. Several studies support its use, especially during adulticide treatment, when adult parasites are dying and the risk of severe thromboembolism is greater. Given the important inflammatory component of this disease, it is not surprising that acute phase proteins (APP) have also shown utility in diagnosing and establishing severity. Among the different APP available, the study of C-reactive protein stands out, which has been shown to be useful in the diagnosis of pulmonary hypertension in various studies. Furthermore, studies in this field continue, with the evaluation of biomarkers such as cortisol, oxidative stress markers or interleukins, to give a few examples. All biomarkers have limited utility and should not be used as a sole diagnostic method, but rather in combination with other diagnostic techniques. However, their simplicity when it comes to obtaining and interpreting make them great allies in the veterinary clinic. To consolidate their use, it is necessary to establish standardized reference values as well as the creation of protocols for use based on the different stages of the disease.

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