



P-16. USEFULNESS OF THORACIC RADIOLOGICAL SIGNS FOR THE DIAGNOSIS AND STAGING OF SEVERITY IN DOGS WITH HEARTWORM

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Dirofilaria immitis is a nematode that causes heartworm disease, which is a severe pathology that causes cardiopulmonary alterations in dogs. Although radiography is used routinely in the study of dogs with heartworm, there are hardly any studies that determine its objective usefulness to detect alterations caused by parasites and establish the severity of the disease. Therefore, the aim was to determine whether specific thoracic radiography findings in dogs with heartworm are associated with some clinical variables, which were: presence/severity of pulmonary hypertension (PH), parasitic burden or presence of microfilariae, as well as epidemiological variables (age and sex). Dorso-ventral and right lateral thoracic radiography projections were made in 49 heartworm-infected dogs, and the vertebral heart score (VHS), the right cranial pulmonary artery at the level of the fourth rib (PA:4R) ratio, and the diameter of the right caudal pulmonary artery at the level of the ninth rib (PA:9R) ratio were calculated. All the animals were subjected to an echocardiography examination to estimate the parasite burden and the presence of PH based on a right pulmonary artery distensibility index (RPADi). Additionally, blood samples were collected to assess the presence of microfilariae. The results showed that there were 85.7% of dogs with radiographic lung alterations (mainly vascular pattern, interstitial or bronco-interstitial pattern) and 67.3% presented anomalies of the cardiac silhouette (mainly cardiomegaly, enlargement of the right chambers and dilatation of the pulmonary trunk). The VHS was increased in 42.9% of dogs and PA:4R and PA:9R ratios were enlarged in 31.3% and 19.5%, respectively. The VHS was not useful to evaluate any of the studied epidemiological and clinical parameters but the PA:4R and PA:9R ratios were significantly increased in dogs with PH. Moreover, Pearson's correlation analysis showed a negative relation between the PA:4R and PA:9R ratios, and the RPADi. Moreover, the PA:4R and PA:9R ratios were significantly increased in dogs with high parasite burden. Similarly, older dogs presented significantly higher PA:4R and PA:9R ratios. Results showed that thoracic radiography could be a useful and complementary important tool to assess cardiopulmonary alterations in canine heartworm disease.

Clinical/epidemiological variable	Groups by variable	PA:4R ratio	PA:9R ratio
Pulmonary Hypertension (RPADi <29%) *	Presence of PH	1.16 ± 0.32	1.31 ± 0.30
	Absence of PH	0.92 ± 0.19	1.07 ± 0.19
Parasite burden *	High burden	1.13 ± 0.28	1.23 ± 0.29
	Low burden	0.88 ± 0.22	1.09 ± 0.21
Microfilariae	Presence of MF	1.04 ± 0.29	1.18 ± 0.28
	Absence of MF	0.92 ± 0.21	1.08 ± 0.16
Age *	Older dogs (6-15 years)	1.13 ± 0.22	1.24 ± 0.31
	Younger dogs (1-5 years)	0.95 ± 0.35	1.12 ± 0.21
Sex	Females	1.04 ± 0.27	1.20 ± 0.25
	Males	0.99 ± 0.30	1.11 ± 0.30

Table 1. Results of PA:4R and PA:9R ratios. (*): statistically significant differences between groups in both ratios.

References

1. Buchanan JW, Bücheler J. (1995). Vertebral scale system to measure canine heart size in radiographs. J Am Vet Med Assoc. 206:194-199.
2. Falcón-Cordón Y, Montoya-Alonso JA, Caro-Vadillo A, Matos-Rivero JI, Carretón E (2019). Persistence of pulmonary endarteritis in canine heartworm infection 10 months after the eradication of adult parasites of *Dirofilaria immitis*. Vet Parasitol. 273:1-4.
3. Kim, S., Park, H., Lee, J., Lee, Y., Choi, H. (2019). Comparison of Radiographic and Echocardiographic Features between Small and Large dogs with Heartworm Disease. J Vet Clinics. 36: 207-211.
4. Oui, H., Oh, J., Keh, S., Lee, G., Jeon, S., Kim, H., Yoon, J., Choi, J. (2015). Measurements of the pulmonary vasculature on thoracic radiographs in healthy dogs compared to dogs with mitral regurgitation. Vet Radiol Ultrasound. 56: 251-256.





5. Venco, L., Genchi, C., Colson, P.V., Kramer, L. (2003). Relative Utility of Echocardiography, Radiography, Serologic Testing and Microfilariae Counts to Predict Adult Worm Burden in Dogs Naturally Infected with Heartworms. In: Seward RL, Knight DH, editors. Recent Advances in Heartworm Disease, Symposium'01. Batavia, IL: American Heartworm Society; pp. 111–124.

