

RIGHT PULMONARY VEIN TO PULMONARY ARTERY RATIO: A NEW ECHOCARDIOGRAPHIC INDEX OF PULMONARY HYPERTENSION IN WEST HIGHLAND WHITE TERRIERS WITH IDIOPATHIC PULMONARY FIBROSIS

E. Roels¹, A.C. Merveille¹, E. Krafft¹, F. Farnir¹, S. Gomart², C. Clercx¹, K. Mc Entee²

¹ULG, Liege, Belgium

²ULB, Brussels, Belgium

Canine idiopathic pulmonary fibrosis (CIPF) is a progressive interstitial lung disease mainly affecting West Highland white terriers (WHWT). Pulmonary hypertension (PH) may develop secondary to hypoxic vasoconstriction and/or pulmonary parenchymal infiltration. In the absence of measurable tricuspid regurgitation (TR), this co-morbid condition may be difficult to diagnose non-invasively. The degree of cardio-pulmonary impairment in CIPF dogs can be evaluated through blood gas analysis (BGA) and 6 minute walking test (6MWT). A new echocardiographic index, the right pulmonary vein to pulmonary artery ratio (PV/PA) has been described for the detection of pulmonary venous hypertension. The aim of this study was to investigate PV/PA in CIPF in order to determine its utility in the detection of PH and in the assessment of cardio-pulmonary disease severity. This prospective clinical cohort study included 10 WHWT with CIPF (Group A), 9 healthy WHWT (Group B) and 25 healthy dogs from other breeds (Group C). Diameters of right PV and PA were measured, in bi-dimensional (BD) and M-modes (MM), in a parasternal right long axis view, at the end of the T wave. Other echocardiographic parameters for evaluation of PH were also measured: speed of TR, acceleration time to ejection time ratio of the pulmonary flow (AT:ET) and pulmonary artery to aorta ratio (PA/Ao). BGA was performed in 14 dogs (9, 1 and 4 in groups A, B and C) and 6MWT in 17 dogs (8, 6 and 3). Values are given as mean±SD. In BD and MM mode, the PV/PA ratio was lower in group A (MM: 0.62±0.25, BD: 0.51±0.20) compared to group B (MM: 0.98±0.17, BD: 0.93±0.12, $P\leq 0.01$) and group C (MM: 1.03±0.13, BD: 1.00±0.10, $P\leq 0.0001$). The changes in PV/PA were both due to an increase of PA ($P\leq 0.01$) and a decrease of PV ($P\leq 0.05$). TR was found in 60% of dogs with CIPF; mean pressure gradient was 34.03±16.90 mmHg. AT:ET was lower in group A (0.42±0.08) compared to group C (0.50±0.04, $P=0.002$) and tended to be lower compared to group B (0.48±0.07, $P=0.09$). PA/Ao was not statistically different between groups. PV/PA was correlated with arterial pO₂ values (B mode: $r = 0.870$, $P=0.0001$) and results of the 6MWT (B mode: $r = 0.791$, $P=0.0003$). PV/PA was also correlated with AT:ET and the speed of TR, but not with PA/Ao. In conclusion, in WHWT affected by CIPF, PV/PA is a useful indicator of PH and could serve in the assessment of disease severity.

Conflicts of interest: No conflicts of interest reported