

# Utility of Cardiovascular Point-of-Care Ultrasound to Detect Pre-Capillary Pulmonary Hypertension

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Early recognition of pre-capillary pulmonary hypertension (PCPH) could benefit affected dogs, especially moderately to severely affected dogs should receive rapid treatment. Unfortunately, diagnosis of PH remains challenging in practice. Doppler-echocardiography, the non-invasive gold-standard to diagnose PCPH, requires specialized equipment and skills. Thoracic radiographs, largely available to practitioners, lack sensitivity to detect even severe PCPH. Cardiovascular point-of-care ultrasound (CV-POCUS) is a reproducible, time- and cost-effective technique, well accepted to assess left heart chamber size and function. A recent study assessing the caudal vena cava diameter to detect moderate to severe canine PCPH failed to demonstrate diagnostic benefit. We hypothesized a 10-point CV-POCUS pulmonary hypertension score (PHS), differentiates dogs with various degrees of PCPH, and might have good accuracy to identify patients with moderate to severe PCPH.

Client-owned dogs were prospectively included between September 2017 and February 2020. A board-certified cardiologist performed a complete echocardiography and classified dogs based on right heart remodeling and/or tricuspid/pulmonic regurgitation gradients into 4 categories (C1 to C4, being no, mild, moderate, and severe PCPH, respectively). No and mild PCPH and moderate and severe were regrouped as G1 and G2 respectively.

Four standard CV-POCUS views were assessed by a blinded non-cardiologist, who had received a 2-hour theoretical PHS-training. A score of 0 to 2 was assigned for 1) right atrial (RA) and/or ventricular (RV) enlargement; 2) RV hypertrophy; 3) interventricular septum (IVS) flattening; 4) pulmonary trunk enlargement; and 5) right-sided congestive signs, resulting in a global score between 0 and 10. Global scores were compared between C1 to C4 and G1 and G2 using non-parametric tests. A receiver-operating characteristic curve was established to determine the ideal cutoff value to differentiate G1 from G2. Data are expressed as median and range.

Fifty dogs, (C1=15, C2=5, C3=10, and C4=20) were included, resulting in G1=20 and G2=30 dogs, respectively. Global score was significantly higher for C4 (9;7–10) than C1 (0;0–4) ( $p<0.001$ ), C2 (4;1–5) ( $p=0.008$ ) and C3 (4.5;2–8) ( $p=0.023$ ). Global score for C3 was significantly higher than C1 ( $p=0.023$ ), but not C2. Global scores of G2 (8;2–10) G2 were significantly higher than G1 (0.5;0–5) ( $p<0.001$ ). Area under the receiver-operating characteristic curve for PHS indicated a cut-off value of 5 discriminated G2 from G1 with a sensitivity of 77% and a specificity of 100% (AUC: 0.944;  $p<0.001$ ).

Moderate to severe PCPH can be detected with good accuracy by non-cardiologists using a 10-point CV-POCUS PHS score.

Disclosures

No disclosures to report.

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