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Letter to the Editor

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Dear Editor,

We thank Dr. Visser and colleagues for the article, "Diagnostic Value of Right Pulmonary Artery Distensibility Index in Dogs with Pulmonary Hypertension: Comparison with Doppler Echocardiographic Estimates of Pulmonary Arterial Pressure" [Visser et al. JVIM. 2016 Mar; 30(2):543]. We found the report to be enlightening, but have a single concern with regard to terminology. The clinical value of measuring right pulmonary artery (RPA) properties in dogs with pulmonary hypertension is emerging as a useful tool in veterinary medicine and it is important to define terminology accurately and consistently.

Dr. Visser and colleagues define the RPA distensibility index (DI) as a shortening fraction of the RPA in systole and diastole, using the formula: RPA DI = $([RPA_S - RPA_D]/RPA_S) \times 100$. Dr. Visser's manuscript references Venco et al. in Veterinary Parasitology from 2014 in reporting the RPA DI.[1] However, in the preclinical, nonveterinary and human literature on pulmonary artery (PA) changes with pulmonary hypertension, distensibility is defined differently and importantly is dependent on pulmonary artery pressure. Indeed, the current literature includes a variety of calculations to describe PA properties, including distensibility, compliance, stiffness, and relative area change (RAC).[2,3]

Distensibility, compliance, stiffness, and RAC require an area or diameter measurement, which in humans[4,5] and in an animal models of pulmonary hypertension[6] are measured by the gold standard of MRI. Only the first three require an invasive pressure measurement, which is typically obtained by right heart catheterization.[4,5] The definitions of these variables are: 1. Distensibility = ([max PA area − min PA area)/min PA area × 100]/pulse pressure) (%/mmHg); 2. Compliance = (max PA area − min PA area)/pulse pressure (mm^2/mmHg); 3. Stiffness = ln(pulse pressure)/[(max PA area − min PA area)/min PA area] (dimensionless); and 4. Relative Area Change = (max PA area − min PA area)/min PA area × 100 (%).[4,5,7]

We believe RPA measurement by echocardiography is of clinical value in dogs with pulmonary hypertension, and that use of consistent and accurate terminology in studies of PA properties would be advantageous. As it does not require an invasive pressure measurement, the RPA RAC could be particularly useful. In human clinical studies, RAC correlates with stiffness and predicts death in pulmonary hypertension.[4] Also, this measurement is comparable between MRI and echocardiography in dogs with pulmonary hypertension.[6] The use of the term "RPA RAC" rather than "RPA DI" will accomplish the goal of describing the measurement that Visser et al. provided in their article, will promote accurate comparisons to previous measurements of RAC in human clinical studies, and will stimulate critical comparisons of echo-obtained RPA RAC measurements to the gold standard of MRI in the future.

The Vesser et al. article contains exciting and important information regarding echocardiographic measurements in pulmonary hypertension. Our aim is to begin a conversation among veterinary cardiologists interested in scientific information regarding pulmonary hypertension with the goal of developing an accurate and consistent vocabulary with which the field can be advanced.

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