Repeatability and reproducibility of right ventricular Tei index valves derived from three echocardiographic methods for evaluation of cardiac function in dogs

ABSTRACT

Objective: To evaluate repeatability and reproducibility of right ventricular Tei index (RTX) values derived from dual pulsed-wave Doppler, conventional pulsed-wave Doppler, and tissue Doppler echocardiography and to investigate relationships and repeatability among the 3 methods in healthy dogs.

Animals: 6 healthy adult Beagles.

Procedure: Echocardiography was performed on each dog on different days for 2 weeks (3 times/d) by 2 echocardiographers. Intraobserver within- and between-day and interobserver coefficients of variation (CVs) and intraclass correlation coefficients (ICCs) for RTXs derived from dual pulse-waved Doppler (RTX_{DPD}), conventional pulsed-wave Doppler (RTX_{PD}), and tissue Doppler (RTX_{TD}) methods were determined. Degrees of agreement among RTX values derived from the 3 methods were assessed by modified Bland-Altman analysis.

Results: Least squares mean (95% confidence interval) RTX_{td} was 0.50 (0.46 to 0.54), which was significantly higher than that for RTX_{DPD} (0.27 [0.23 to 0.31]) and RTX_{PD} (0.25 [0.21 to 0.29]). Agreement between RTX_{DPD} and RTX_{PD} was good (bias [mean difference], 0.04 [95% confidence interval, −0.03 to 0.10]). The RTX_{dpd} had high within-day (CV, 6.1; ICC, 0.77) and interobserver (CV, 3.5; ICC, 0.83) repeatability, but between-day repeatability was not high. The RTX_{td} had high within-day repeatability (CV, 6.0; ICC, 0.80), but between-day and interobserver repeatability were not high. Within-day, between-day, and interobserver repeatability of RTX_{PD} were not high.

Conclusions and clinical relevance: RTX_{dpd} measurement was a repeatable and reproducible method of cardiac evaluation in healthy dogs. The RTX_{TD} values were significantly higher than the RTX_{DPD} and RTX_{PD} values; therefore, RTX values derived from different echocardiographic methods should be interpreted with caution.

Keyword: Echocardiographic methods; Cardiac function; Dogs