

Società Italiana delle Scienze Veterinarie



relazione: Two-dimensional echocardiographic estimates of left Titolo volumes obtained from two different views in dogs similar but not interchangeable

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# Two-dimensional echocardiographic estimates of left atrial volumes obtained from two different views in dogs are similar but not interchangeable

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# BACKGROUND

## Echocardiographic LA volume estimates can help clinicians to quantify LA dimension and function in dogs

## Monoplane Simpson's Method of Discs (SMOD) is commonly used



and RPLA views...













### To examine agreement between the two methods in a population of healthy dogs and dogs with left-sided cardiac chambers diseases

## To compare LA volumes (SMOD) with cube or sphere volume from LA diameter from RPLA view (mathematical formulas)



#### Retrospective study

- Echocardiographic examinations in which RPLA and LA4C views were adequately obtained in dogs
- $\succ$  Healthy dogs (n=32) and dogs with left-sided cardiac chambers diseases (n=98)  $\geq$  2 dogs with PDA, 2 dogs had MD, 2 dogs SAS and 92 dogs with MMVD
- > LA volume by a monoplane SMOD, in systole and diastole, from both views



## MATERIALS AND METHODS







#### Estimates of LA volume based on the RPLA-derived LA diameters (cube or sphere volume), minimum and maximum



Cube volume= d<sup>3</sup>

Sphera volume=  $4/3\pi r^3$ 

> Limits of Agreement analysis to determine agreement between the two SMOD methods, and cube/sphere methods

Shapiro-Wilk Test

Intra-observer measurement variability (% difference <12%; CV <10%)</p>

# MATERIALS AND METHODS







#### Two SMOD methods for both systolic and diastolic volumes are SIMILAR but NOT INTERCHANGEABLE

DIASTOLE



# RESULTS





## RESULTS

#### Normalized differences for LA average volumes between the two methods exceeded 25% in 17% of dogs (Diastolic volumes)



Normalized differences between the two methods exceeded 30% in 20% of dogs (Systolic volumes)





# RESULTS

#### LA4C method slightly underestimate (small LA sizes) and overestimate (large LA sizes) LA volume compared to RPLA method

Normal LA







## RESULTS

#### LA4C method slightly underestimate (small LA sizes) and overestimate (large LA sizes) LA volume compared to RPLA method









#### Cube method overestimated volumes compared to SMOD methods

#### LA4C



# RESULTS





#### Sphere method agrees with both SMOD methods similar to that obtained when comparing the two SMOD estimates

LA4C



# RESULTS



# DISCUSSION

#### **Bland-Altman analysis**

are not interchangeable

and systole

Cube vs sphere volume estimate

Heteroscedasticity

### LV volumes from RPLA or LA4C view in both diastole and systole

### Absolute differences were mostly <10ml for both views in diastole





# CONCLUSION

are similar but not interchangeable The same method should be used for monitoring individual cases

- SMOD estimates of the LA volume from the two echocardiographic views
- The sphere volume formula provides a "crude" estimate of the LA volume





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## **GRAZIE PER L'ATTENZIONE** sisvet2021@safood.it | segreteria@aimseventi.it