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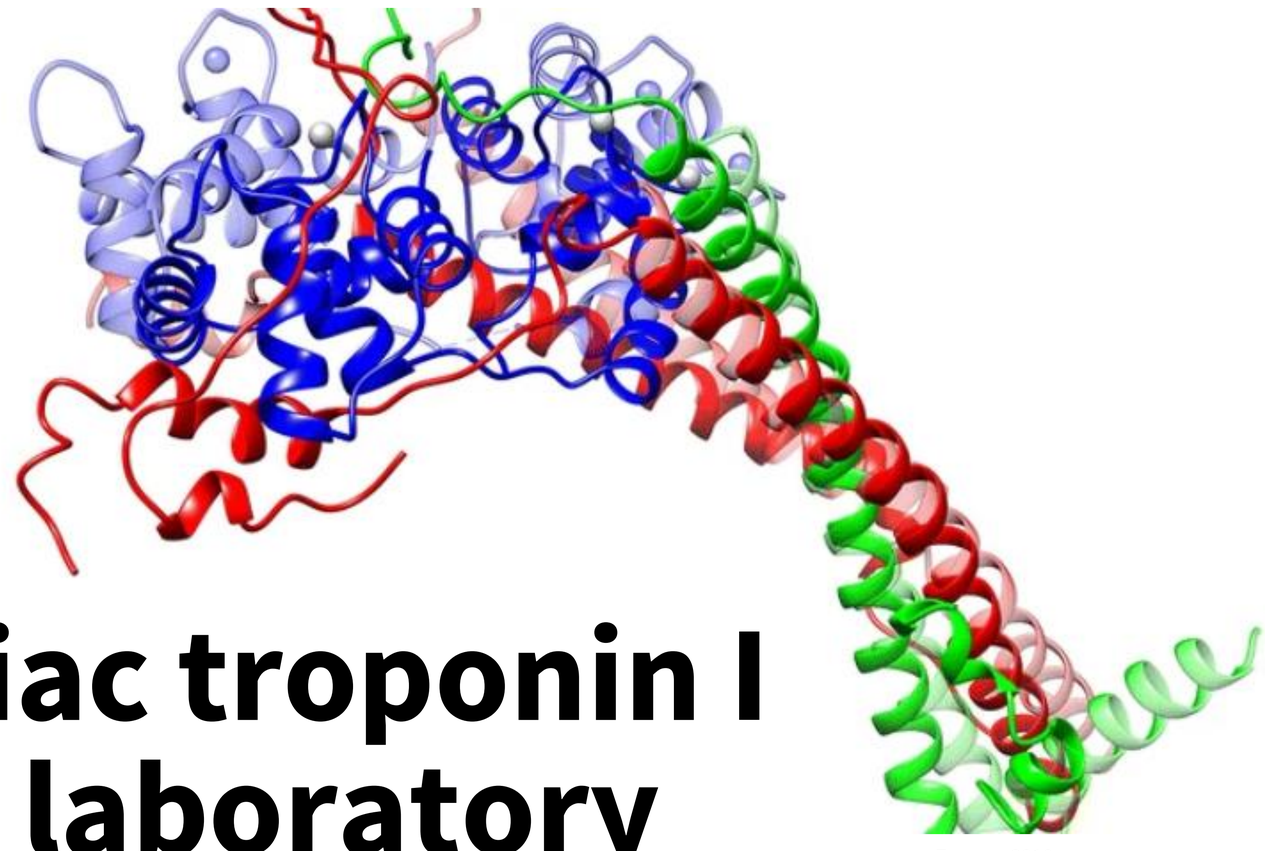

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Association of cardiac troponin I concentration with laboratory values, arrhythmia, and outcome

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Cardiac troponin I (cTnI) is a sensitive biomarker for detecting myocardial injury caused by cardiac and non-cardiac diseases[1,2]. This study examines the association between cTnI concentrations and:

- **Other laboratory values**
- **Occurrence of tachycardia and/or arrhythmia**
- **Outcome**

Material and Methods

Retrospective study
- Horses of different breeds, age > 1 year
- cTnI and blood work measured within 12 hours

Data Collection
Horse data, laboratory values, occurrence of tachycardia (> 48 bpm) and/or arrhythmia, type of arrhythmia, diagnosis, and outcome

Statistical analyses
Spearman rank correlation: Association between cTnI and creatine kinase (CK), aspartate aminotransferase (AST), and lactate dehydrogenase (LDH) activities; sodium (Na), potassium (K), chloride (Cl), calcium (Ca), magnesium (Mg), serum amyloid A (SAA), and fibrinogen concentrations; and leukocyte and neutrophil counts.

Kruskal-Wallis test: Association between cTnI and occurrence of arrhythmia, and type of arrhythmia.

Mann-Whitney U test: Associations between cTnI and occurrence of tachycardia, and clinical outcome.

The level of significance was set at $p < 0.05$.

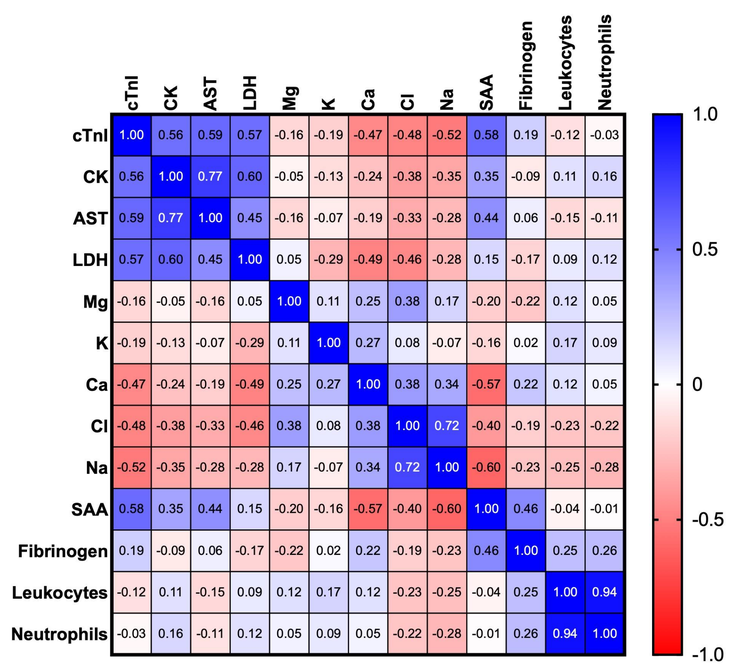

Fig.1: Spearman rank correlation matrix.
Correlations coefficients (r_s) are displayed, ranging from -1.0 to +1.0.

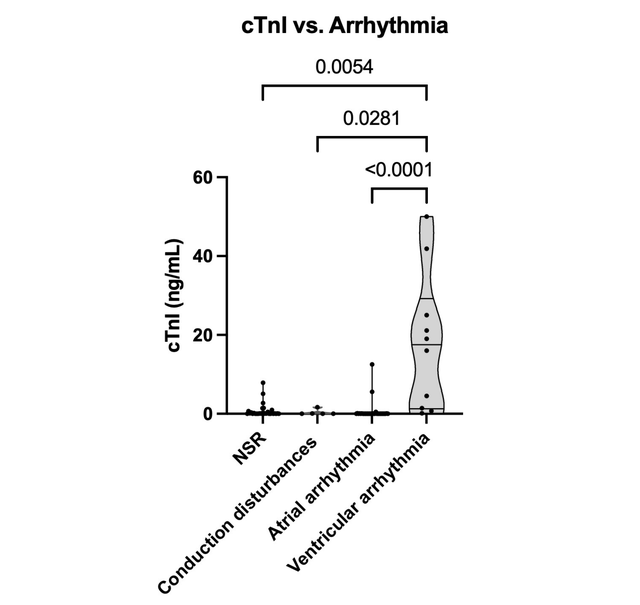

Fig.2: cTnI versus arrhythmia type.

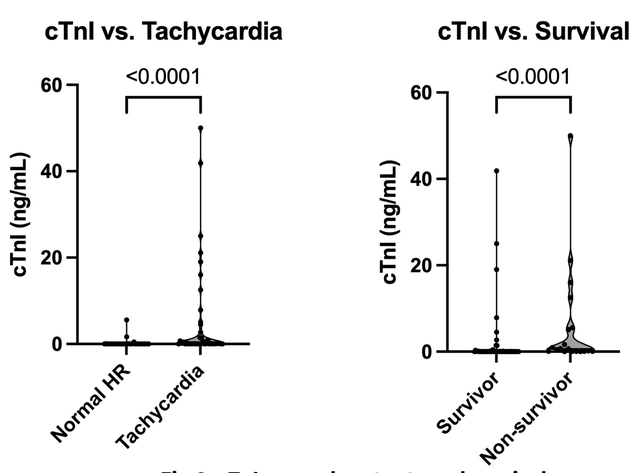

Fig.3: cTnI versus heart rate and survival.

Results

Cases
- Seventy-one horses
  (14±7y; 549±82kg; 22 mares, 46 geldings, 3 stallions)
- cTnI concentration between 0.00-50 ng/mL

Correlations of laboratory values (Fig. 1)
- Positive correlation: cTnI with CK, AST, LDH and SAA
- Negative correlation: cTnI with Na, Cl and Ca

cTnI vs. arrhythmia, heart rate, and outcome (Fig. 2-3)
cTnI is significantly higher
- In horses with ventricular arrhythmias
- In horses with tachycardia (> 48 bpm)
- In non-survivors

Discussion and Conclusion

- cTnI correlates with specific and nonspecific muscle enzymes in horses.
- If elevated muscle enzyme activities cannot be explained, cTnI should be measured to exclude myocardial damage.
- SAA, but no other inflammatory markers, correlate with cTnI, possibly because of its high sensitivity and tissue inflammation during myocardial damage.
- cTnI is increased in some horses with tachycardia, with arrhythmias (particularly those of ventricular origin), and in non-survivors, indicating that primary or secondary myocardial damage may play a role in the disease process.
- These findings aid to improve the understanding of cTnI's diagnostic and prognostic value in equine myocardial injury.

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References

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2. Lippi, G. and F. Sanchis-Gomar, *Cardiac troponins in diagnostics of equine myocardial injury.* Journal of Laboratory and Precision Medicine, 2020. 5.