Relationship between hair elements and severity of atrioventricular block in horses

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Abstract

The aim of this study was to investigate the relationships between the mean concentrations of trace elements and the severity of second-degree atrioventricular (AV) block in mane hair of horses. Electrocardiographs (ECG) of horses were continually recorded for 6 hrs using a holter cardiac monitor to determine dropped ventricular beats (DVBs) which can be used as an indicator of the severity of AV block. Mane hair Ca, Cu, Mg and Zn concentrations were measured by the particle induced X-ray emission method. The Zn/Cu ratio and Ca concentration in mane hair were significantly and positively correlated with the hourly DVBs in horse with second-degree AV block ($p<0.01$, $r^2=0.485$, and $p<0.05$, $r^2=0.351$, respectively). Proposed diagnostic cutoff points for hair Ca concentration and Zn/Cu ratio based on ROC curves analysis in detecting second-degree AV block were set at 1536 µg/g and 26.0, respectively. Those results with horse hair suggest that the evaluation of the Ca, Cu, Mg and Zn status in mane hair by this method is strongly related to the severity of second-degree AV block and might predict the susceptibility of an individual much before the development of the symptom.