Plasma ionized magnesium in horses with Systemic Inflammatory Response Syndrome (SIRS)

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Introduction

• The association of magnesium disorders with Systemic Inflammatory Response Syndrome (SIRS) in horses is less well established compared to human critical care medicine.
• The purpose of this study was to (1) determine plasma ionized magnesium concentrations [iMg] in horses with and without SIRS upon admission to a referral hospital, (2) identify differences in plasma [iMg] and diagnostic categories or outcome, and (3) identify if there is an association between hypomagnesemia and hypocalcemia.

Methods

• Observational prospective study.
• Sixty-seven horses (n=57 adults and n=10 neonatal foals) admitted to a referral veterinary hospital from May 2019 to January 2020 were included.
• Diagnostic categories were inflammatory colic (n=6), ischemic colic (n=7), obstructive colic (n=11), respiratory diseases (n=7), ophthalmologic diseases (n=3), sick neonatal foals (n=9), other diseases (n=14) and healthy controls (n=10).

Results

• Twenty-one (31.3%) horses on admission fulfilled SIRS criteria.
• Plasma [iMg] from SIRS horses on admission was 0.47 ± 0.09 mmol/L (mean ± SD), 19% of them had hypomagnesemia (<0.4 mmol/L).
• Horses with ischemic colic presented the lowest [iMg] (0.37±0.09 mmol/L).
• Plasma [iCa] from SIRS horses on admission was 1.48 ± 0.12 mmol/L (mean ± SD), 28.5% had hypocalcemia (<1.4 mmol/L).

• All the groups had mean [iCa] within the reference range (1.4-1.6 mmol/L).
• Only 9.5% of SIRS horses presented both hypomagnesemia and hypocalcemia on admission.
• Mean [iMg] and [iCa] ± SD from non survivors was 0.48 ± 0.08 mmol/L and 1.43 ± 0.19 mmol/L, respectively.

Conclusions

• Horses with severe colic presented hypomagnesemia and hypocalcemia.
• Altered plasma ionized calcium and magnesium concentrations on admission were not apparently associated with SIRS.
• Overall, ionized calcium and magnesium concentrations were not subjectively associated with outcome.