Insulin dysregulation in horses with systemic inflammatory response syndrome.

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Introduction
Systemic inflammation is a cause of insulin dysregulation in many species but the insulin and glucose dynamics in adult horses diagnosed with systemic inflammatory response syndrome (SIRS) are poorly documented. We hypothesised that in horses with SIRS, insulin and glucose dynamics would be altered and associated with survival.

Materials and Methods
Prospective study enrolling adult horses diagnosed with SIRS admitted to a referral hospital in which serum insulin and glucose concentrations were measured. Horses were grouped by outcome (survival, hyperinsulinemia and hyperglycemia) and compared with p < 0.05 considered significant.

Results
Fifty-eight horses were included in the study and 36 (62%) survived. At admission, 21 horses (36%) were hyperinsulinemic and 44 horses (88%) were hyperglycemic, with survivors having significantly higher serum insulin and a significantly lower serum glucose concentration.

Horses diagnosed with hyperinsulinemia at any time during hospitalization were 4 times more likely to survive whereas horses that were hyperglycemic at any time during hospitalization were 5 times less likely to survive. Serum glucose concentration and presence of hyperglycemia were both associated with severity of disease. Insulin/glucose ratio, reflecting insulin secretion, was significantly higher in survivors whereas glucose/insulin ratio, reflecting peripheral tissue insulin resistance, was significantly lower in non-survivors. Only in survivors was there a significant correlation between serum insulin and glucose concentrations.

Relevance to Clinical Equine Practice
Hyperinsulinemia and hyperglycemia are common features of SIRS in horses but those presenting with relative hypoinsulinemia and corresponding hyperglycemia suggestive of endocrine pancreatic dysfunction have a worse prognosis.