

THE ACUTE PHASE RESPONSE TO SURGERY IN CLINICALLY NORMAL AND DISEASED HORSES

Pollock PJ, Prendergast, M, Bellenger CR

Department of Veterinary Surgery, University College Dublin, Dublin, Ireland

Introduction

A variety of inflammatory markers, coupled with changes in a number of haematological and biochemical parameters have classically been used to diagnose, monitor and prognosticate disease in horses. Unfortunately these traditional markers respond fairly slowly to the presence of disease and inflammation and have wide normal ranges (Allen and Cold 1988; Pepys et al 1989). Serum amyloid A (SAA) is an acute phase protein common to human beings, cattle, sheep, mice, and several other species, including the horse. In several of these species, plasma concentration of SAA has been shown to increase 1000-fold following tissue injury, cellular necrosis, inflammation, and infection and decline rapidly in the recovery phase.

Materials and Methods

In this study, the serum concentration of serum amyloid A (SAA), haptoglobin and fibrinogen was measured in a group of 26 horses before, and at intervals after, elective (n=19) and non-elective surgery (n=8). A second group of normal horses was sampled to establish normal values. Plasma SAA concentration was measured using an ELISA and compared with a number of other parameters, including routine haematological and biochemical parameters, fibrinogen, and haptoglobin.

Results

There was a significant, rapid, and repeatable increase in SAA concentration in response to surgical trauma in both elective and non-elective horses. The control horses demonstrated a range of serum concentrations in agreement with the normal range expected in the horse, 0- 0.2µg/mL. Following surgery a peak mean concentration of 16.41µg/mL for elective horses and 27.29µg/mL for non-elective horses was noted 24 hours after the end of the surgical procedure.

In contrast, the serum concentration of haptoglobin and fibrinogen demonstrated a more gradual rise following surgery and failed to decline by the end of the sampling period, 72 hours after surgery.

Conclusion

In conclusion, this study demonstrated that serum amyloid A, when compared to traditional measured parameters of inflammation in horses, has a tight normal range and increases rapidly in response to surgical stimuli and infection. Furthermore, SAA concentrations return to normal rapidly in the recovery phase, and consequently measurement of SAA is useful in the diagnosis and monitoring of surgical disease in horses.

The ELISA method for SAA measurement was simple to perform and gave useful results quickly. The measurement of SAA in normal and diseased horses should be useful in monitoring the recovery of horses with surgical disease and may be of use in determining prognosis.