

Serum amyloid A (SAA) is a so-called acute phase protein. Acute phase proteins are produced in the liver in response to all harmful stimuli leading to tissue injury and subsequently released to the blood stream¹. Increased blood concentrations of SAA and other acute phase proteins are thus found when the horse suffers from aseptic and septic (bacterial and viral) infections, inflammatory disease, from neoplasia, or when the horse has been exposed to endo- and exotoxins, trauma or surgery.

SAA is a major acute phase protein in the horse². This means that the basal values are very low (in most healthy horses SAA concentrations are immeasurable) and that levels increase quickly (within few hours) to very high values (often more than 100 or even 1000 mg/L) in response to infection and inflammation. The plasma clearance of SAA is very quick³, and levels will thus decrease soon after inflammation has subsided. These characteristics make SAA particularly suited for real-time monitoring of inflammatory activity, and measured SAA blood levels thus give a good indication of the current disease status of the horse. Blood concentrations are high when inflammation is active, but levels will decrease soon after inflammation has subsided (as occurs in response to successful treatment of the inflammatory condition). Relapse or exacerbation of the inflammatory disease will be accompanied by new increases in serum SAA levels. Repeated measurements may thus be indicated to monitor recovery in a patient and to assess when the horse has recovered completely and can return to work.

SAA may be used for diagnosing the presence of inflammatory disease². Moreover, levels reflect degree or severity of inflammation and thus give an indication of the prognosis of the patient. Inflammatory conditions in the airways⁴, the gastrointestinal tract^{5,6}, the reproductive organs^{6,7}, and in the musculoskeletal system^{6,8,9} have been shown to be accompanied by increased blood levels of SAA.

Foals often display quite unspecific signs of disease, and it may be difficult to differentiate infectious from non-infectious disease in the neonate. Studies in foals have shown that 1) SAA may aid in differentiating between infectious and non-infectious disease (and hence help determine whether the foal needs treatment with antibiotics or not), 2) SAA can help predicting the prognosis or outcome for the patient, and 3) repeated measurements of SAA reflect effect of treatment¹⁰⁻¹². After surgery the SAA response displays a rise-and-fall pattern if the horse is recovering uneventfully¹³. Sustained increases in serum SAA levels postoperatively may indicate that infectious complications have occurred¹⁴. Monitoring SAA levels after surgery may aid in early detection of postoperative infection and thereby to early instigation of appropriate therapy, which reduces postoperative discomfort and facilitates recovery.

SAA can be produced by several cell types other than hepatocytes. Cells in the joint¹⁵ and in the mammary gland¹⁶ also secrete SAA in response to inflammation. Levels of SAA will be elevated in synovial fluid during inflammatory joint disease^{9,15}, which may be used for diagnostic and prognostic purposes as well as for monitoring effect of treatment. Mastitis causes increases in SAA levels in milk.

SAA is a valuable adjunct to the panel of inflammation markers already available in equine medicine. Studies have suggested that SAA is even more sensitive than classical inflammation markers such as white blood cell counts and fibrinogen^{11,14}.

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