

DIAGNOSTIC VALUE OF PROTEIN ELECTROPHORESIS IN LARGE PSITTACINES – A REVIEW OF 30 CASES

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ABSTRACT

Alterations of prealbumin levels in association with hypo- or hyperglobulinemia were found indicative of acute inflammatory disease or chronic hepatopathia, respectively. Generally, prealbumin and globulin levels moved into opposite directions.

1 INTRODUCTION

Serum protein electrophoresis has become a common diagnostic tool in avian medicine. We have tested its diagnostic value on 30 psittacines with various diseases¹.

2 MATERIAL AND METHODS

30 large psittacines (African grey parrots, Amazons, Cockatoos, Macaws) from different private owners, exhibiting symptoms of disease were submitted to clinical examination, haematology, clinical chemistries, microbiology and endoscopy. For every bird, diagnoses were formulated and categorized as acute or chronic diseases. 11 birds suffered from more than one disease. The serum of every bird was examined for albumin und globulin fractions by capillary electrophoresis. Assessment of the fractions was done using published reference values. The results of electrophoresis were linked up to the diagnoses and assessed for their diagnostic value.

3 RESULTS

3.1 Respiratory diseases

Acute aerosacculitis and pneumonia was diagnosed in 2 birds. In one bird, extreme β - and γ -globulinemia was seen. In the second bird, all globulins were slightly elevated and prealbumin was low, persisting for at least 4 weeks.

In 12 birds with chronic aerosacculitis and pneumonia, alterations in globulins comprised predominantly elevations in α -, β - and γ -globulins in an irregular pattern, i. e. in most cases only one fraction was elevated. Decreases of β - and γ -gammaglobulins were irregular, too.

Elevations of α - and decreases of β -globulins and albumin were the predominant findings in chronic rhinitis/sinusitis in 3 birds.

3.2 Hepatopathia

In 1 bird, acute hepatitis caused by septicaemia from infection with gram-negative bacteria caused a clear decrease of albumin and prealbumin levels as well as β -hyperglobulinemia. Four weeks later, γ -globulins were high, β -globulins low, albumin, prealbumin and α -globulins had achieved normal ranges.

Chronic hepatopathia occurred in 15 birds.

In 9 of these birds, hepatopathia was the only diagnosis. In 7 of these birds, β - and γ -globulins were decreased or low normal. In 2 birds, α - and γ -globulin elevations were combined with elevated bile acids and decreased prealbumin in one case. In 3 birds (amazons), a relation was seen: swollen or fatty liver, heavy lipemia, increasing levels of prealbumin in connection with decreasing albumin, β - and γ -globulins. The same was seen in another amazon with prealbumin in normal range.

3.3 Other diseases

Hypogammaglobulinemia due to stress was seen in a juvenile macaw. Marked elevation of all globulin fractions was seen with severe cardiovascular disease in an Blue-and-gold Macaw and with gastrointestinal dilatation in an African grey positive for Bornavirus-antibodies.

4 DISCUSSION

In acute diseases in peafowl, α - and β -globulins increase within 16 hours². γ -globulins increase later, as production of specific antibodies takes more than 10 days¹. In human medicine, prealbumin is a negative acute-phase-protein: when α - and β -globulins rise, prealbumin decreases. Those alterations could be clearly demonstrated in 3 acute cases, with follow-ups after 4 weeks in 2 cases.

The decrease of prealbumin associated with α -hyperglobulinemia clearly indicated an early stage of acute disease. Electrophoresis was a valuable diagnostic tool in acute cases.

Chronic respiratory disease in 15 birds showed an irregular pattern of elevations and reductions in globulins. 11 birds suffered from concomitant diseases. In all cases, electrophoresis was of limited diagnostic value.

In patients with chronic hepatopathia, low normal or decreased beta- and gammaglobulins were found in all cases indicating chronic inflammation and immunosuppression.

In 3 amazons, severe hyperprealbuminemia associated with lipemia and alterations of the liver was seen. The increase of prealbumin in these cases roughly went along with the degree of β - and γ -hypoglobulinemia. In 2 patients, elevation of bile acids and hypoprealbuminemia in one case indicated an acute onset of liver disease.

The significance of prealbumin in birds has not been evaluated yet. Increases in laying hens have been reported. In human medicine, increases in prealbumin are found in chronic persistent hepatitis. When chronic persistent hepatitis becomes active, prealbumin levels drop.

As no liver biopsies were taken in this study, it remains unproven whether the 3 cases of severe hyperprealbuminemia represent chronic persistent hepatitis, and the 2 acute cases represent chronic active hepatitis. Nevertheless, high levels of prealbumin in association with β - and γ -hypoglobulinemia are suggestive of liver disease.

5 CITATION INDEX

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