

**HEPATIC AND RENAL
FUNCTION OF MARES
SUBMITTED TO
BOTHROPS ANTIGEN
INOCULATION FOR
PRODUCTION OF
ANTIOPHIDIAN SERUM**

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Abstract: Snakebites have been a medical and veterinary challenge. The only treatment available and recommended by the World Health Organization and the Ministry of Health is serum therapy. The objective of the study was to evaluate the liver and kidney function of horses submitted to the basic immunization protocol currently used by Instituto Vital Brazil for the production of antiotherapeutic serum. 05 horses were evaluated with bothrops venom inoculation during the period of three immunization cycles. Blood samples were collected for biochemical examination and liver and kidney evaluation, which is essential to increase knowledge about these poison inoculation protocols to cause liver damage. The ALT, albumin and creatinine parameters had no effect ($p>0.05$) of time. The variables AST, GGT, total proteins and globulin showed higher values ($p<0.05$) in T3 compared to T1 and T2. Urea showed a higher value at T1. There was a trend ($p=0.07$) of AF elevation at T3. The results obtained suggest that over the period of baseline immunization, liver changes may occur, but not kidneys.

Keyword: Equines, antiophidian serum, liver, kidney, Bothrops.

INTRODUCTION

Snakebites have been a medical and veterinary challenge. The only treatment available and recommended by the World Health Organization and the Ministry of Health is serum therapy. The production of serum involves the subcutaneous injection of crotalide venoms in horses, although these injections cause, in a small percentage of animals, local alterations such as edema and abscess, systemic alterations have not yet been demonstrated. The metabolism of the inoculated venom in the horse is hepatic and its elimination is renal. There are few studies on the evaluation of liver and kidney changes in animals used in the production

of antivenoms, especially studies integrating different approaches to evaluate these effects. The evaluation of the preservation of these organs is carried out mainly by physical examination, ultrasound and laboratory examination (blood count, liver and kidney profile).

OBJECTIVO

The objective of the study was to evaluate the liver and kidney function of horses submitted to the basic immunization protocol currently used by Instituto Vital Brazil-IVB for the production of antiotherapeutic serum.

MATERIAL AND METHODS

Five mares between 5 and 15 years of age, which had not been previously inoculated and housed in the IVB under semi-intensive management, were used. The baseline immunization consists of eight inoculations of the antigen solution, with an interval of one week between them. Blood samples from the mares were collected in tubes without anticoagulant, by puncturing the jugular vein, in three moments during the baseline immunization process, the first sample being collected prior to the start of immunization (T1); second collection in the fourth week (T2) and the third at the end of immunization (T3). After collection, the blood was stored and transported refrigerated to the Laboratory of Clinical and Molecular Research Marcilio D. Nascimento, Faculty of Veterinary Medicine, "Federal Universidade Federal Fluminense". The hepatic profile was evaluated by the enzymes Transaminase Aspartate Aminotransferase (AST), Alanine Transaminase (ALT), GammaglutamylTransferase (GGT), Alkaline Phosphatase and total proteins, albumin and globulins (calculated by the subtraction of albumin in the protein). The renal profile was assessed by measuring urea and creatinine.

Spectrophotometry or kinetics methodology was adopted, according to the manufacturer's standards, in an automated device (Labmax 4000®, LabTest, São Paulo, Brazil).

RESULTS AND DISCUSSION

The statistical program Bioestat 5.0 was used for the analysis of biochemical indices. Initially, data normality was verified using the Lilliefors test. Next, the effect of time (T1, T2, T3) on the variables was verified by analysis of variance for repeated measures and comparison of means by Tukey's test at 5% significance.

The parameters of ALT (11.1 ± 4.0 U/L), albumin (2.3 ± 0.3 g/dL) and creatinine (4.0 ± 0.2 mg/dL) had no effect ($p > 0.05$) of time. As for the variables AST (140 ± 18.4 vs $246.2 \pm 41.7 = 301.6 \pm 29.7$ U/L), GGT (4.6 ± 1.9 vs $3.6 \pm 3.9 = 13.2 \pm 4.2$ U/L), total protein (7.8 ± 0.5 vs $7.33 \pm 0.4 = 9.2 \pm 0.4$ g/dL) and globulin (5.3

± 0.5 vs $4.89 \pm 0.3 = 7.1 \pm 0.3$ g/dL) showed higher values ($p < 0.05$) in T3 compared to T1 and T2. Urea showed a higher value at T1 (34 ± 3.4 vs $22 \pm 3.1 = 26.2 \pm 3.3$ mg/dL). There was a trend ($p = 0.07$) of AF elevation at T3. The increase in AST may corroborate damage to hepatocytes or muscles, due to the action of the inoculated antigen. The increase in GGT indicates damage to the bile canaliculi and reduced flow in the bile ducts, probably due to intrahepatic causes due to antigen inoculation during immunization. Total protein, on the other hand, had a high value due to the increase in globulin synthesis resulting from the immunization process.

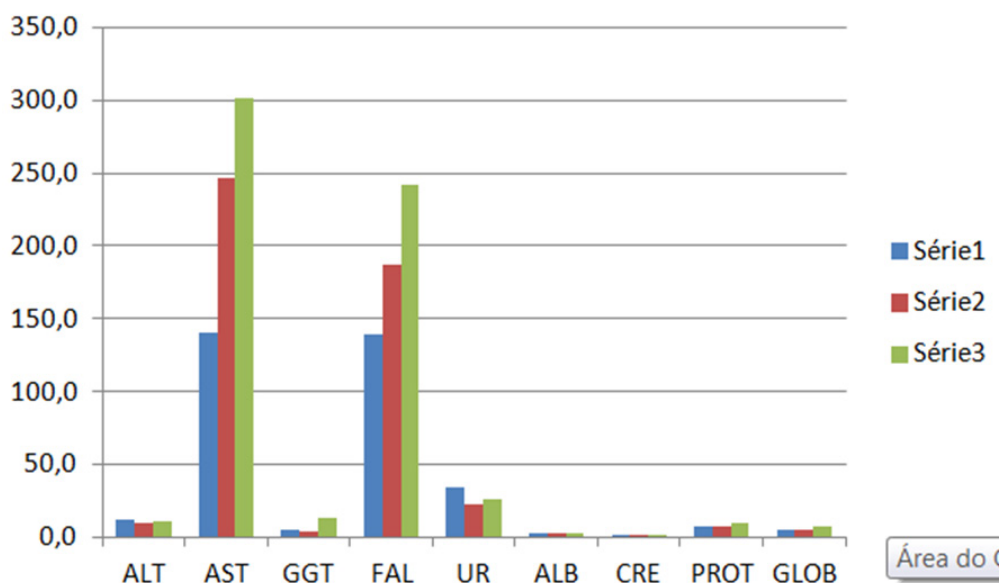
CONCLUSION

The results obtained suggest that over the period of baseline immunization, liver alterations may occur, but not kidney alterations (on the proposed methodology).

REFERENCES

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Graphic 1. quantification of the studied enzymes in the three different times.