Fall Panicum (Panicum dichotomiflorum) Hepatotoxicosis in Horses and Sheep


Background: Fourteen horses at a boarding stable in Virginia were diagnosed with hepatic disease and locally grown hay was implicated as the cause.

Hypothesis: Panicum dichotomiflorum, the predominant grass species in the hay, is hepatotoxic to horses.

Animals: Naturally occurring cases were adult horses of various breeds. Two healthy adult horses and 2 healthy adult sheep were used in feeding trials.

Methods: Blood and liver specimens collected from affected animals during the outbreak were analyzed. Some of the affected animals were treated supportively; the main intervention was hay withdrawal. Feeding trials were not blinded and no treatments were provided. Blood and liver specimens were collected and analyzed throughout the trials.

Results: Five affected animals were euthanized, whereas the others recovered. One research horse was euthanized for postmortem examination, and the other research animals recovered after hay withdrawal. All affected animals had evidence of hepatic disease with abnormally high aspartate aminotransferase (AST), sorbitol dehydrogenase (SDH), gamma glutamyl transferase (GGT), and alkaline phosphatase (ALP) activity. Evaluation of liver biopsy specimens disclosed mild lymphocytic and histiocytic inflammation, mild vacuolar change (hydropic degeneration), prominently clumped chromatin, and necrosis of individual hepatocytes.

Conclusions and Clinical Importance: Severe hepatotoxicosis developed rapidly after Panicum hay exposure. Patchy hepatocyte necrosis was observed, implicating apoptosis as the mechanism of hepatotoxicosis. Absence of fibrosis in the research animals indicates that immediate withdrawal of Panicum hay should allow all but severely affected animals to recover from acute exposure.

Key words: Apoptosis, Hepatocyte necrosis, Liver, Steroidal saponins

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