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Comparison of blood aminotransferase methods for assessment of myopathy and hepatopathy in Florida manatees (Trichechus manatus latirostris).

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Source

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Abstract

Muscle injury is common in Florida manatees (Trichechus manatus latirostris). Plasma aspartate aminotransferase (AST) is frequently used to assess muscular damage in capture myopathy and traumatic injury. Therefore, accurate measurement of AST and alanine aminotransferase (ALT) is important in managed, free-ranging animals, as well as in those rehabilitating from injury. Activities of these enzymes, however, are usually not increased in manatees with either acute or chronic muscle damage, despite marked increases in plasma creatine kinase activity. It is hypothesized that this absence of response is due to apoenzymes in the blood not detected by commonly used veterinary assays. Addition of coenzyme pyridoxal-5-phosphate (P5P or vitamin B6) should, therefore, result in higher measured enzyme activities. The objective of this study was to determine the most accurate, precise, and diagnostically useful method for aminotransferase measurement in manatees that can be used in veterinary practices and diagnostic laboratories. Additionally, appropriate collection and storage techniques were assessed. The use of an optimized commercial wet chemical assay with 100 micromol P5P resulted in a positive bias of measured enzyme activities in a healthy population of animals. However, AST and ALT were still much lower than that typically observed in domestic animals and should not be used alone in the assessment of capture myopathy and muscular trauma. Additionally, the dry chemistry analyzer, typically used in clinics, reported significantly higher and less precise AST and ALT activities with poor correlation to those measured with wet chemical methods found in diagnostic laboratories. Therefore, these results cannot be clinically compared. Overall, the optimized wet chemical method was the most precise and diagnostically useful measurement of aminotransferase in samples. Additionally, there was a statistically significant difference between paired serum and plasma measurement, indicating that separate reference intervals should be established for serum and plasma. Finally, storage of these enzymes at -70 degrees C for 1 mo resulted in up to a 25% decrease in enzymatic activity in manatee plasma.

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