Bovine Plasma Thromboplastin Antecedent (Factor XI) Deficiency

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This Holstein female was the result of a mating between a Holstein cow in a university herd and a bull in an A.1. stud.

The bull had been eliminated from use prior to this incident for a variety of reasons, notably because dairymen did not like his daughters since they frequently developed large joints, particularly knees, hocks and stifles. It was also noted by the veterinarian in charge of the health of the bull that he was very severely affected with spastic syndrome.

This cow's early life was uneventful. She had her first calf at 26 months of age. During her first lactation she was treated on several occasions for tarsitis and carpitis. She had her second calf at 38 months of age. Delivery was uneventful. On the day following parturition the cow was unable to stand. She remained recumbent for eight days. On the first day she was down, the only abnormality found was enlarged knees and hocks. The cow remained alert and ate during the time she was down. Laboratory tests for serum Ca, P, K, Mg, Na, C1 and GOT were normal, as was the hemogram. The clotting time was observed to be prolonged.

Following this observation the total protein and A-G ratio were found to be normal. A BSP test was conducted and was normal. Platelet numbers were within normal range. The Lee and White clotting time was 45 minutes.

On the seventh day of recumbency the cow would stand on her rear legs but would fall when attempting to support weight on her front legs. At this point she was treated extensively with analgesics and anti-inflammatory drugs. The next morning she could stand.

Other therapy during the course of the recumbency was supportive and empirical.

Radiographic interpretation of the knees and joints was hemarthrosis. Joint taps were consistent with this finding.

Subsequent coagulation studies revealed that the prolonged clotting time was due to a deficiency of Plasma Thromboplastin Antecedent.

This animal died at 43 months of age. Postmortem diagnosis was multicentric lymphocytic leukemia with intraperitoneal hemorrhage.

Approximately 40 paternal half-sisters of the cow discussed were surveyed. Almost all were found to be partially deficient in Factor XI and one was found to be totally deficient in Factor XI. The totally deficient animal is affected with hemarthrosis.

The animal that is totally deficient in Factor XI was bred with frozen semen from her sire. The resulting calf is totally deficient. Studies are continuing.

This is the first reported case of Factor XI deficiency in animals other than man.

Laboratory tests were conducted in the laboratories of men listed in the reference.

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References

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