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INVESTIGATIONS ON THE CLINICAL SIGNS OF HYPER D-LACTATEMIA IN CALVES

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Introduction: The similarities between the clinical picture of the D-lactic acidosis in humans (incoordination, ataxia, loss of memory, disorientation, disturbance of consciousness up to coma) which occurs following resection of large portions of the small intestines when undigested carbohydrates are transported into the large intestine, and that reported for calves with metabolic acidosis due to neonatal diarrhea led to the idea that clinical signs in acidotic calves are due to hyper D-lactatemia rather than to acidosis per se. Therefore it was the objective of the study reported here to investigate whether clinical signs can be induced by hyper-D-lactatemia in the absence of acidosis.

Material and methods: Ten calves, up to 2 weeks old, were randomly assigned to either the D-lactate or the control group. "Test calves" received an injection of 25 g sodium-D-lactate (223.07 mmol) in 100 ml Aqua ad inj., control calves were given the same volume of 0.9 % sodium chloride, both solutions were warmed, and injected intravenously within one minute. Clinical examinations were performed by two clinical examiners that were blinded to the status (test or control) of the calves, prior to injection in order to ensure that calves involved in the study were in good health, and in short intervals up to four hours following injection.

Results: Between 8 to 40 minutes from the start of the experiment each calf that had received sodium-D-lactate could be distinguished with certainty from the control calf on the basis of clinical signs. All experimental calves showed impaired palpebral reflex, that is eyes were closed with a delay and as if in slow motion. Three calves were somnolent, the remaining two appeared quiet and withdrawn. All calves showed a staggering, "drunken" gait. In four calves long periods of motionless or slightly waving or tottering standing with lowered head and drooping ears could be observed. By contrast, no impairment of the sucking reflex was recorded in any of the calves.

Discussion: In various attempts that have been made in the past to estimate the degree of acidosis in calves with neonatal diarrhea on the basis of clinical signs authors list alterations in posture and/or behavior as signs of metabolic acidosis. The results of this study demonstrate that with the exception of impairment of sucking reflex, all signs that have been attributed to metabolic acidosis in calves can be reproduced by inducing hyper-D-lactatemia without acidosis.