Disseminated Intravascular Coagulation in Cattle with Abomasal Displacement

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ABSTRACT

The purpose of the study was to evaluate haemostatic function in cattle with abomasal displacement (AD) and to reflect the occurrence of disseminated intravascular coagulation (DIC). Ten adult cattle with left displacement of abomasum (LDA) (group I), 10 adult cattle with right displacement of abomasum with volvulus (RDA) (group II) and 10 clinically healthy adult cattle (control group) were used as material. Numbers of platelets (PLT) and coagulation tests (activated partial thromboplastin time (APTT), prothrombin time (PT), thrombin time (TT), serum fibrin/fibrinogen degradation products (FDPs), fibrinogen) were measured before the surgical treatment of cattle with LDA and RDA. APTT was prolonged only in group II compared with the control and group I (p<0.05). However, when the individual values of coagulation profiles of each cow were evaluated, two cattle in group I and three cattle in group II had at least three abnormal coagulation profiles, which reflect the occurrence of DIC. These cattle died after surgical treatment. The two cattle with LDA had abnormal APTT, FDPs and PLT values; three cattle with RDA had abnormal APTT, PT, TT, FDPs and PLT values. APTT (5 cases), FDPs (5 cases) and thrombocytopenia (5 cases) were the three most common abnormal tests on coagulation profile in the cattle with LDA and RDA. The results of the study indicate that cattle with AD had a spectrum of haemostatic dysfunction and that DIC was a significant risk factor for mortality.

Keywords: abomasal displacement, cattle, coagulation profile

INTRODUCTION

Abomasal displacement (AD) occurs most frequently in high-yielding cows during early lactation (Breukink, 1991; Hund and Nelson, 1995; Turgut and Ok, 1997). While left abomasal displacement (LDA), in which the abomasum is trapped between the rumen and the left abdominal wall, is more commonly diagnosed, right abomasal displacement (RDA) is usually accompanied by a degree of volvulus, in which rotation of the proximal duodenum, abomasum and omasum occurs, and is therefore a more serious problem (Wallace, 1989; Jean et al., 1989; Constable, 1991).
Many papers have described the diagnosis and treatment of AD as well as the theory of causation, pathophysiology, and prognosis (Yamahato, 1982a,b; Muyle et al., 1990; Breukink, 1991). However, there is no report evaluating the coagulation profiles in cattle with abomasal displacement. There is only one study in which APTT and PT have been evaluated in cows with LDA, and no difference was found (Ogurtan et al., 2003).

Disseminated intravascular coagulation (DIC) is a continuously progressing process that can be subdivided into three phases: phase I, compensated activation of the haemostatic system; phase II, decompensated activation of the haemostatic system; phase III, full-blown DIC (Muller-Berghaus et al., 1999). The pathological process is characterized by widespread fibrin deposition in the microcirculation with subsequent ischaemic damage and by the development of a haemorrhagic diathesis caused by the consumption of procoagulants and hyperactivity of fibrinolysis (Morris, 1990b). In large animals, DIC has been described in association with forms of localized and/or systemic septic processes (e.g. salmonellosis, metritis, mastitis), neoplasia, gastrointestinal disorders (e.g. strangulating intestinal obstruction, acute enteritis, protein-losingenteropathy), renal disease and haemolytic anaemia (Morris, 1990b).

Numerous laboratory tests of haemostasis may be abnormal during DIC; however, no one test consistently or specifically provides a definitive diagnosis (Morris, 1990b). The minimum laboratory data needed to evaluate haemostasis in large animals are the PLT, plasma fibrinogen contents, PT (extrinsic system), APTT (intrinsic system), and FDPs. The results of these tests will also vary according to the severity and fulminant nature of the process and the time of sampling (Blood et al., 1983; Morris, 1990a).

The purpose of the study reported here was to evaluate the haemostatic function in cattle with AD and to reflect the occurrence of DIC.

MATERIALS AND METHODS

Animals

In this study, 10 adult cattle with LDA (group I), 10 adult cattle with RDA (group II) and 10 clinically healthy adult cattle (control group) were used. All of these cows were Swiss Holstein. The ages of the animals varied from 3 to 7 years. Their mean (±SD) age was 4 ± 1.5 years. All were in early lactation (7–12 days) and were fed with high-concentrate diet. On admission the animals had been ill on average for 3 days.

Cattle were excluded from the study if they had had any medication within the 48 h period prior to study entry.

Clinical examinations

The cattle with AD showed loss of appetite, decreased rumen motility and milk production, and little or scant defecation. All animals were examined with regard to abdominal auscultopercussion, ballotment of abdomen for splashing sound, rectal