

Using haematological and serum biochemical findings as prognostic indicators in calf diarrhoea

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Abstract The objective of this study was to evaluate the value of some haematological and serum biochemical constituents for predicting the survival of diarrhoeic calves. Twenty-four Holstein-breed calves, up to 14 days old, that showed signs of naturally occurring diarrhoea were included in the study. A complete clinical evaluation was performed before treatment. Haematological parameters (haematocrit, fibrinogen and complete blood count) and serum biochemistry including serum albumin, glucose, blood urea nitrogen (BUN), creatinine, sodium (Na), potassium (K) and chloride (Cl) were measured. The diarrhoeic calves had significantly higher serum concentrations of total protein, BUN, creatinine and K and significantly lower levels of serum glucose and Cl than the control calves. The haematological profile of diarrhoeic calves was significantly different from that of the normal ones. The concentration of K was also significantly higher in diarrhoeic calves that died than in diarrhoeic calves that survived. We assessed the values of haematocrit, BUN, creatinine and K as risk factors for calf diarrhoea survival. The mean of maximum values of these parameters in diarrhoeic calves that survived and the minimum values of dead calves were considered as cutoff points. The results of the present study showed that diarrhoeic calves with BUN levels above 13.07 mmol/l and K concentrations above 5.63 mEq/l were 5.6 and four times more likely to die, respectively.

Keywords Calf · Diarrhoea of calves · Haematology · Biochemistry · Prognostic indicators

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Introduction

Diarrhoea remains the leading cause of mortality in dairy and beef calves (Constable 2004). The traditional indices such as clinical signs and faecal consistency give poor guidance to correct the decisive pathological disturbances (Michell et al. 1992; Brooks et al. 1996). Pare et al. (1993) showed that haematocrit and total protein at or shortly after birth may have important prognostic value in evaluating risk of calf diarrhoea. Others have also shown that the blood urea concentration has the best prognostic value and conclude that, by measuring two other parameters (the haematocrit and the blood chloride, Cl, concentration), they were able to classify the calves into two distinct dead or survivor groups with 80% accuracy (Fayet and Overwater 1978). In the current study, we have used other haematological and biochemical values to predict the fate of diarrhoeic calves. This is of paramount importance in treatment strategies as measuring haematological and biochemical values of the blood can be done as STAT tests in a very short period of time. Therefore, despite the conventional bacterial culture and anti-biograms that require a fairly long period of time (24–48 h), routine testing of haematological and biochemical values of the blood can provide veterinarians with useful information in a matter of few hours.

Materials and methods

Twenty-four Holstein calves up to 14 days old with naturally occurring diarrhoea, loss of appetite, dehydration and depression were studied. As a control group, 15 healthy calves of the same age and sex as their diarrhoeic counterparts and from the same farms were also included.