ACM was made in each animal by isolation culture of coliform using raw milk obtained from the affected quarter. Prognosis was divided between good or poor based on milk production within 1 month. Therefore, the poor prognosis group was comprised of culled cattle or death within 30 days after the first medical examination.

Results

The pre-challenge value of plasma Fe concentration was 151.7 ± 57.3 g/dl. The Fe concentration in plasma then significantly decreased, reaching 47.7 ± 29.4 µg/dl at 24 hr after endotoxin challenge ($P<0.001$). Significantly low levels of plasma Fe in calves were maintained from 12 to 48 hrs after endotoxin challenge compared with the pre-challenge values ($P<0.001$). Of the 47 dairy cattle, the good and poor prognosis groups were composed of 30 and 17 cattle, respectively. The dairy cattle with ACM were found to have lower amounts of Fe compared to those without mastitis (150.5 µg/dl, $P<0.01$). Serum Fe concentration was significantly lower in dairy cattle with poor prognosis (15.0 µg/dl) compared with the cows that had a longer survival and good prognosis (54.0 µg/dl). The area under the ROC curves for Fe concentrations was 0.781 ($P<0.001$). The proposed diagnostic cutoff points for Fe concentrations in serum for identification of poor prognosis of acute coliform mastitis based on the analysis of the ROC curves were set at < 31.5 µg/dl. Sensitivity and specificity of proposed diagnostic cutoffs for serum Fe concentration was 73.3% and 94.1%, respectively.

Significance

The results from the endotoxin challenge study showed that LPS infusion induced progressive decreases in the plasma Fe concentration between 12 to 48 hr after the endotoxin challenge compared with the pre-challenge values. Therefore, the first clinical examination day is an appropriate time for assessing prognosis of ACM using Fe concentration in serum. Serum Fe concentration was significantly lower in dairy cattle with poor prognosis compared with the good prognosis group on the first clinical examination day. Based on ROC curves, the proposed diagnostic cutoff of serum Fe concentration on the first clinical day for detecting a poor prognosis was set at <31.5 µg/dl. Our results indicate that the assessment of serum Fe concentration is a promising diagnostic tool for the prognosis of ACM in dairy cattle.

Endotoxin activities in bronchoalveolar lavage fluids from calves with mycoplasma bronchopneumonia

Y. Nishi, DVM[1]; **K. Suzuki**, DVM, PhD[1]; **T. Shimamori**, DVM[1]; **K. Tsukano**, DVM[1]; **M. Tsuchiya**, PhD[2]; **A. Niehaus**, DVM, MS, DACVS[3]

[1]The School of Veterinary Medicine, Rakuno Gakuen University, Ebetsu, Hokkaido 069-8501, Japan
[2]Microbial Solutions, Charles River, Charleston, SC 29407
[3]The Department of Veterinary Clinical Sciences, Ohio State University, Columbus, OH 43210

Introduction

The frequency and severity of complex bovine respiratory diseases have increased globally, and respiratory disease is currently regarded as the principle health problem and most economically important disease in young calves. Bovine *mycoplasmas* are often isolated from pneumonic lungs in combination with other pathogens such as *Pasteurella multocida*. The systemic complications and deleterious outcomes associated with Gram-negative infections have been attributed to the exaggerated inflammatory responses largely elicited by a highly pro-inflammatory component of the Gram-negative bacterial envelope known as endotoxin. To the best of our knowledge, comparative studies on the relationship between endotoxin activity in plasma and bronchoalveolar lavage fluids (BALF), and between endotoxin activity and bronchopneumonia have not yet been performed in calves. Therefore, the aim of the present study was to determine plasma and/or BALF endotoxin activity in calves with bronchopneumonia.

Materials and Methods

Seventeen calves were patients at the Rakuo Gakuen University Veterinary Teaching Hospital showing clinical signs such as coughing, nasal discharge, fever, and pulmonary adventitious breath sounds. *M. bovis* was detected in the BALF of all 17 calves by a PCR method based on a 16S rRNA gene. As

controls, 17 *mycoplasma*-free calves with no abnormal clinical signs were also enrolled in this study. Single blood samples were collected by jugular venipuncture from all calves. The BALF samples were obtained during bronchoscopic examination using a standard protocol. Immediately prior to testing, plasma and BALF samples were diluted 20- and 100-fold in endotoxin-free water, respectively. Plasma was then heated for 10 min at 176 °F (80 °C). Endotoxin activities in plasma and BALF were measured by traditional kinetic turbidimetric (KTA) and chromogenic analysis (KCA), respectively. The lower limits of detection for this assay in plasma and BALF were 0.042 and 0.140 EU/ml, respectively. The mean values for each dependent variable were compared with the normal values, using the Student's *t*-test after ANOVA as *F* test. ROC curves were used to characterize the sensitivity and specificity of each parameter to *mycoplasma* bronchopneumonia-associated changes.

Results

In healthy calves, plasma endotoxin activity was below the limit of detection in 14 out of 17 calves (82.4%) with a median plasma endotoxin activity of 0.042 EU/ml. The median endotoxin activity in BALF obtained from control calves was 2.44 EU/ml. The median endotoxin activities in plasma (0.334 EU/ml, $P<0.001$) and BALF (105.8 EU/ml, $P<0.001$) were significantly higher in calves with bronchopneumonia compared with the control. The proposed optimal cut-off point for plasma endotoxin activity was determined to be 0.078 EU/ml (AUC=0.929, $P<0.001$, Se 92.9%, and Sp 100%). In the same manner, the proposed optimal cut-off point for endotoxin activity in BALF was determined to be 6.05 EU/ml (AUC=0.933, $P<0.001$, Se 81.3%, and Sp 84.6%). Plasma endotoxin activity was significantly and positively correlated with that of BALF ($r^2=0.916$, $P<0.001$).

Significance

In healthy calves, plasma endotoxin activity was below the limit of detection in 14 out of 17 calves (82.4%) with a median plasma endotoxin activity of 0.042 EU/ml. The median endotoxin activity in BALF obtained from control calves was 2.44 EU/ml. The median endotoxin activities in plasma (0.334 EU/ml, $P<0.001$) and BALF (105.8 EU/ml, $P<0.001$) were significantly higher in calves with bronchopneumonia compared with the control. The proposed optimal cut-off point for plasma endotoxin activity with regard to Se and Sp (J) was determined to be 0.078 EU/ml (AUC=0.929, $P<0.001$, Se 92.9%, and Sp 100%). In the same manner, the proposed optimal cut-off point for endotoxin activity in BALF was determined to be 6.05 EU/ml (AUC=0.933, $P<0.001$, Se 81.3%, and Sp 84.6%). Plasma endotoxin activity was significantly and positively correlated with that of BALF ($r^2=0.916$, $P<0.001$).

Prevalence and characteristics of radiographically confirmed juvenile tarsal osteochondrosis in purebred Angus bulls

S.E. Emerson, *DVM[1]*; **M.F. Barrett**, *DVM, MS, ACVR[1]*; **T.N. Holt**, *DVM[2]*; **L. Bass**, *DVM, MS, DABVP (Equine)[2]*; **S. Rao**, *BVSc, MVSc, PhD[2]*

[1]*Colorado State University, Department of Environmental and Radiological Health Sciences, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, CO 80523*
[2]*Colorado State University, Clinical Sciences Department, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, CO 80523*

Introduction

Hindlimb lameness in breeding bulls is a source of significant financial loss, with a proportion of bulls having osteochondrosis (OC). The objective of this study is to determine the characteristics, change over time, and sire association of radiographically identified tarsal OC lesions in a purebred Angus breeding herd.

Materials and Methods

Fifty purebred Angus bull calves were randomly selected from the 2014 bull calf crop of the CSU Beef Breeding and Genetics Herd. Exams were performed at 3 time points: median ages 7.5 months, 50 bulls; 12.5 months, 49 bulls; and 19.8 months, 9 bulls. All tarsi were clinically and radiographically examined. Effusion and presence and location of OC lesions were evaluated.