LEG WEAKNESS, OSTEOCHONDROSIS AND BLOOD ACID-BASE PARAMETERS IN PIGS.

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Introduction

A relationship between osteochondrosis and leg weakness in pigs has been described by Goedegebuure et al. (3). The extent of agreement between pathological findings and clinical observations is about 70 % in the hind limbs and about 60 % in the fore limbs. These percentages, however, are higher in pigs housed in groups of four than in individually housed animals (10). As osteochondrosis is thought to be the major cause of leg weakness (e.g. 6) and disturbances in the growth of bone may be related to metabolic acidosis in poultry (4), rats (8), sheep (1) and cattle (7), we decided to study the relationship between osteochondrosis, leg weakness and blood acid-base parameters in pigs.

Material and methods

Clinical observations of the locomotory system (9) were made at 4-weekly intervals on 40 individually housed crossbred pigs (Large White x Dutch Landrace) during a period in which the animals' live-weight increased from 20 to 100 kg. The pigs were fed ad libitum. After a live-weight of about 75 kg was reached, blood samples were collected via a puncture of the vena cava cranialis. The blood was analysed for acid-base parameters, and haemoglobin and lactate concentrations. Finally, a pathological evaluation, based upon macroscopic, histologic and radiographic observations, was made of the joint cartilage and growth plates of the humerus and femur. The correlations between the average value of the clinical score and the average of the pathological evaluation, as well as the base excess value per pig were computed.

Results and discussion

The percentage agreement between the clinical score for leg weakness and the pathological evaluation for osteochondrosis were 47.5 % and 75 % for the fore and the hind limbs, respectively. These data concern the whole population of 40 pigs. Correlation coefficients, however, were computed only on the data of 26 pigs. The lactate levels of these pigs were 4.50 mmol/l or lower, indicating that the amount of stress was rather low (11). Higher lactate levels may produce changes in pH and pH-derived parameters (5). The percentage agreement in the 26 animals between the scores for leg weakness and osteochondrosis were 46.2 % and 65.4 % for fore and hind limbs, respectively. The correlation coefficient, however, was only .20. Although there is some correlation, it is too low to be of any importance. The same is valid for the correlation between the leg weakness score and the base excess values of the blood which was .30. Base excess, on the contrary, is significantly correlated ($r = .51$; $P < .01$) with the osteochondral lesion score. Lower base excess values are associated with an increase in the incidence of cartilage abnormality. In poultry, diets containing ammonium chloride, which induces metabolic acidosis, are responsible for more cartilage defects (4), while the induction of an alkalosis can improve the condition in genetically susceptible chicks. Now it has to be seen if a change of the acid-base status of the blood of pigs towards higher base excess values reduces the incidence of osteochondrosis.

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