

The impact of pregnancy toxemia in goats on the survival rate of newborn kids

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Introduction

Pregnancy toxemia (PT) is a disease characterized by a marked metabolic acidosis. Severe maternal ketoacidosis leads to an increase in blood lactate levels and fetal acidosis. The increase in L-lactate could be partly responsible for the decrease in pH blood levels of the fetus that could lead to a lower survival rate of the newborn kids. Mortality in does affected by PT can be very high. In order to minimize the associated economic losses, a clinical strategy we have adopted is to induce parturition when specific blood pH is > 7.15 or to perform a cesarean section in the affected goats with a blood pH < 7.15 , the goal being to increase the number of live offspring. One study showed that kids born from PT goats in which a cesarean section was performed had a lower survival rate compared with those born after induction of kidding (77% vs 96%).

The objective of this study was to determine the short-term survival rate of newborn kids born from PT goats following cesarean section and compare it to those from natural delivery. Furthermore, we have measured blood parameters in the immediate post-partum period in order to understand differences between these 2 groups of kids and identify those that can be used as prognostic indicators for survival.

Materials and Methods

The present study involved 8 PT goats, in which a cesarean section was performed and 9 healthy goats which delivered kids naturally, without any assistance. The criteria to include a PT goat in this study was a maternal BHBA level above 3 mmol/L, a blood pH below 7.15 and/or clinical signs such as dropping ears or neurologic signs.

After the cesarean surgery, a blood sample was collected from the jugular vein from the kids born from these goats 15 minutes (maximal) after they were removed from

the uterus. The following parameters were determined: Na^+ , K^+ , Cl^- , HCO_3^- , glucose, pH, base excess (BE), pCO_2 , AnGap, BUN (i-Stat®), L-Lactate (The Edge®), total protein, and packed cell volume.

The number of kids, sex, and weight was recorded after birth, as well as the number of kids deceased until the 7th day after birth was recorded.

The same procedures were performed in the newborn kids of the healthy goats delivering naturally.

Results

There were statistically significant differences between the 13 kids born from the natural kidding and the 21 kids that were born after cesarean section, concerning body weight (8.8 vs 6.6 lb; 4 vs 3 kg, $P < 0.05$), and blood levels of Na^+ (140 vs 137 mmol/L, $P < 0.05$), pH (7.30 vs 7.18, $P < 0.001$), HCO_3^- (24 vs 19 mmol/L, $P < 0.001$), BE (-2 vs -10 mmol/L, $P < 0.001$), BUN (17 vs 20 mg/dl, $P < 0.05$), and L-lactate (3.3 vs 5.8 mmol/L, $P < 0.05$).

There were statistically significant differences between the 15 kids that survived and the 6 kids that did not survive after a cesarean section concerning the blood levels of pH (7.22 vs 7.00, $P < 0.01$), BE (-9 vs -18 mmol/L, $P < 0.05$), pCO_2 (45 vs 61 mmHg, $P < 0.05$), BUN (20 vs 35 mg/dl, $P < 0.01$), and L-lactate (5.4 vs 11 mmol/L, $P < 0.001$).

Significance

Maternal ketoacidosis due to PT has a negative impact on the survival rate of the offspring. This appears to be associated to a metabolic acidosis (lactic acidosis). In the most severe cases the newborns kids also have a respiratory acidosis. It is important to induce kidding or perform a cesarean section in PT goats in the early phases of the disease because it increases the rate of survival of the newborn kids.