In order to identify perinatal parameters that will allow the detection of high-risk calves and predict neonatal outcome, 18 commercial somatic cell nuclear transfer (SCNT)-derived pregnancies were evaluated prospectively. Our hypothesis was that pre-partum ultrasonographic parameters (mean, maximum and minimum fetal heart rates, fetal fluid and movement scores), gestation length, method of delivery, gender and birth weight would allow prediction of neonatal outcome. Calves were delivered vaginally 4.7 ± 1.5 d (n=3) or via Cesarean section (n=15) 2.4 ± 5.9 d from expected calving date. Mean, maximum, and minimum fetal heart rates, fetal movement (score 0 to 3) and fetal fluid echogenicity (score 0 to 3) were evaluated via transabdominal ultrasonography twice daily starting 3.8 ± 5.8 d before expected calving date. Data were analyzed using SAS 9.1 for Windows Software, and Student’s t test, regression analysis and Fisher’s exact test were performed where appropriate. Data are expressed as mean ± SD. Calf survival rate was 61% (vaginal delivery 100 %, Cesarean section 53 %, p=0.2451). Survival rate of calves delivered via Cesarean-section with prior administration of dexamethasone was 58 % (7/12) and 33.3 % (1/3) without dexamethasone (p=0.5692). Fewer males (5/12, 41.7 %) survived than females (6/6, 100 %) (p=0.0377). Non-surviving calves (-1.3 ± 6.7 d) were delivered earlier regarding expected calving date than surviving calves (5.5 ± 2.8 d) (p=0.0356). Non-surviving calves (63.1 ± 9.2 kg) were heavier than survivors (59.3 ± 9.7 kg) (p=0.0134). Weight was not correlated with gestation length (p=0.3556). Mean fetal heart rate in surviving calves was 105.8 ± 16.1 bpm (minimum value observed 81 bpm, maximum value observed 174 bpm), and in non-surviving calves, 116.5 ± 15.9 bpm (minimum value observed 92 bpm, maximum value observed 192 bpm). Mean (p=0.0069), maximum (p=0.0005) and minimum fetal heart rates (p=<.0001) were higher in non-surviving calves. A mean (p=0.0128) or minimum (p=0.0429) fetal heart rate >125 bpm in one or more examinations was associated with neonatal death. When the minimum or mean fetal heart rate remained ≤125 bpm, 73.3 % and 83.3 % of calves lived, respectively. A maximum fetal heart rate >125 bpm was associated with fetal death only when fetal fluids were ≥1 during the same examination. Fluid and movement scores were not associated with neonatal outcome. Therefore, calf gender, gestation length, birth weight and fetal heart rates seem associated with neonatal outcome in bovine SCNT-derived pregnancies and can help identify at risk calves perinatally.

Keywords: Bovine, somatic cell nuclear transfer, pregnancy, ultrasound, monitoring

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