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PERINATAL FETAL HEART RATE CHANGES
AND NEONATAL ARRHYTHMIAS IN THE HORSE

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To investigate the outline of the equine fetal cardiac function in the perinatal period, changes of the fetal heart rate (FHR) in late pregnancy and during normal parturition were analysed recording fetal electrocardiograms (FECG) in healthy mares. Subsequently, neonatal electrocardiograms (ECG) were recorded immediately after birth. In addition, FECG were taken in twin-pregnancy mares to survey the survival status of each fetus.

1. In 32 late-pregnant mares (256–352 days), 34 recordings of FHR were obtained from FECG that each lasted for 20 minutes. With the advance in gestational period, the baseline FHR decreased while the frequency of FHR acceleration and its appearance rate (total acceleration period/total observation period) increased.

2. In one induced and 16 spontaneous parturitions, FHR accelerations were observed as in the pre-partum period at the first stage of labour. But at the second stage of labour, accelerations were rarely observed and variabilities of FHR were small. The baseline FHR of the second stage of labour (58.3 ± 7.3 bpm, Mean \pm SD, $n=15$) was slightly lower than that of the day before parturition (66.4 ± 4.2 bpm, $n=10$) and that of the first stage of labour (64.8 ± 5.9 bpm, $n=10$). The rhythms of fetal hearts, including cases of atrial fibrillation (AF) after delivery, were regular until a few minutes before delivery when the records were readable.

3. Transient AF was recorded by ECG in 5 of 19 newborn foals (26%) immediately after birth. In 3 of 5 cases, AF was observed within 1 minute and returned to sinus rhythm at 5, 6 and 9 minutes after birth, respectively. In 1 case, ventricular tachycardia was recorded from 30 to 50 seconds after birth, followed by AF. Ventricular tachycardia was observed again for 5 seconds at 7 minutes after birth, until sinus rhythm was restored. In another case, sinus rhythm was observed until 2 minutes after birth, then it developed AF for a period of 19 minutes, after which it was resolved spontaneously.

4. In an asphyxial fetus of a twin pregnancy which was aborted artificially at 290 days of gestation, AF was recorded from immediately after delivery to death (the other fetus was still-born).

5. In 3 cases, twin fetuses were aborted at 212, 251, 279 days of gestation, respectively, after being diagnosed by FECG as having only 1 fetus alive at 162, 232, 182 days of gestation, respectively.