**Fetal morphological features and abnormalities associated with equine early pregnancy loss.**

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Pregnancy loss in early gestation (EPL) occurs in approximately 8% of equine pregnancies, although the aetiology is mostly unknown and fetal morphological abnormalities associated with early abortions are not defined. The objectives of the current study were (i) to compare the macroscopic and histological morphology of EPL to clinically normal fetuses and developmental milestones described in the literature and (ii) to identify morphological abnormalities associated with equine EPL.

Clinically normal fetuses (n = 11) were obtained from thoroughbred and pony broodmares and EPL fetuses (n = 27) from thoroughbred mares suffering pregnancy failure. The crown-rump length (CRL) of fetuses was measured and the macroscopic morphology and developmental age determined independently by three blinded examiners, using a standardised protocol. A representative subset of sagittal sections of fetuses was assessed microscopically. Fishers Exact test was used to determine significance (P<0.05) and correlations expressed by Pearson coefficient.

Age and CRL were strongly positively correlated in clinically normal thoroughbred and reference (R = 0.9, P<0.0001) but not EPL fetuses (R = 0.1, P = 0.6). Relatively to controls, the CRL of EPL fetuses was shorter, with evidence of intrauterine growth retardation (IUGR) in 3/8 fetuses assessed. A definite morphological abnormality was confirmed as failed neural tube closure in one EPL fetus. In the remaining 12 fetuses, obtained from mares suffering EPL and eligible for the histological assessment, non-specific neural tissue alterations occurred. A distinct subcutaneous haemorrhage presented as another significant morphological feature of EPL fetuses. In conclusion, fetal morphological features associated with equine EPL were a mismatch of fetal size and age, alterations of the developing neural tissue and localized subcutaneous haemorrhage. A failed neural tube closure was confirmed as a specific abnormality.