Kydd, Julia H. and Case, Ruth and Winton, C. and MacRae, S. and Sharp, E. and Ricketts, S.L. and Saunders, K. and Rash, N. and Newton, J.R. (2016) Polarisation of equine pregnancy outcome is associated with a maternal MHC class I allele. In: International Equine Infectious Diseases Conference X, 4-8 April 2016, Buenos Aires, Argentina.

Polarisation of equine pregnancy outcome is associated with a maternal MHC class I allele

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Identification of risk factors which are associated with severe clinical signs can assist in the management of disease outbreaks and indicate future research areas. Pregnancy loss during late gestation in the mare compromises welfare, reduces fecundity and has financial implications for horse owners. This retrospective study focussed on the identification of risk factors associated with pregnancy loss among 46 Thoroughbred mares on a single British stud farm, with some but not all losses involving equid herpesvirus-1 (EHV-1) infection. In a sub-group of 30 mares, association between pregnancy loss and the presence of five common Thoroughbred horse haplotypes of the equine Major Histocompatibility Complex (MHC) was assessed. This involved development of sequence specific, reverse transcriptase polymerase chain reactions and in several mares, EHV-1 specific, cytotoxic T lymphocyte activity. Of the 46 mares, 10 suffered late gestation pregnancy loss or neonatal foal death, five of which were EHV-1 positive. Maternal factors including age, parity, number of EHV-1 specific vaccinations and the number of days between final vaccination and foaling or abortion were not significantly associated with pregnancy loss. In contrast, a statistically significant association between the presence of the MHC class I B2 allele and pregnancy loss was identified, regardless of the fetus / foal's EHV-1 status ($p=0.002$). In conclusion, this study demonstrated a significantly positive association between pregnancy loss in Thoroughbred mares and a specific MHC class I allele in the mother. This association requires independent validation and further investigation of the mechanism by which the mare's genetic background contributes to pregnancy outcome.