

Theriogenology

Ovarian function following immunocontraceptive vaccination of mares using native porcine and recombinant zona pellucida vaccines formulated with a non-Freund's adjuvant and anti-GnRH vaccines

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Abstract

An important determinant in the selection of any contraceptive agent is the impact on ovarian function, both in the short and longer term. In this study, ovarian activity was monitored in mares immunised with one of the following vaccine formulations; native porcine zona pellucida (pZP), recombinant zona pellucida proteins ZP3 and ZP4 (reZP), pZP and reZP combined or a commercially available anti-GnRH vaccine. The ZP antigens were prepared in an adjuvant formulation consisting of 6% polymeric adjuvant (Montanide™ PetGel A, Seppic, France) and 500 µg polyinosinic-polycytidylic acid - TLR3-agonist (Poly(I:C) HMW VacciGrade™, Invivogen, USA). A vehicle-only control group was administered the adjuvant formulation without antigen. Ovarian activity was monitored using clinical observations (transrectal palpation and ultrasonography of the reproductive tract) in addition to blood sampling for serum progesterone and anti-Müllerian hormone (AMH) concentrations while employing a low sampling frequency. Treatments and measurements were initiated in December (southern hemisphere summer) and subsequent data collection was performed in January, February, March and May. Both reZP and anti-GnRH vaccination were associated with clinically evident ovarian suppression in the short term. Ovarian activity in mares administered a reZP or anti-GnRH vaccine was significantly different to adjuvant control and pZP treated mares. Serum AMH concentrations were different between pZP and anti-GnRH treated mares 3.5 months after the final vaccination. Serum AMH concentrations were significantly correlated with mare age, serum progesterone and ovarian volume.