Maternal recognition and maintenance of pregnancy in the mare

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Abstract

This review highlights some of the unusual physiological features of pregnancy in equids. These include the relatively prolonged sojourn of the zygote in the mare's oviduct and the requirement for embryonic synthesis and release of prostaglandin E\(_2\) (PGE\(_2\)) to stimulate oviducal relaxation and contractility for onward embryonic passage into the uterus. The conceptus remains spherical due to persistence of its glycoprotein blastocyst capsule, and it must move continually throughout the uterine horn between Days 6 and 17 (Day 0 = ovulation) in order to release its, as yet unidentified, maternal recognition of pregnancy signal onto a sufficient area of endometrium to suppress the normal cyclical release of endometrial prostaglandin F\(_{2\alpha}\) (PGF\(_{2\alpha}\)) and thereby establish luteostasis and the pregnancy state.

The trophoblast of the developing chorion differentiates into invasive and non-invasive components between Days 25 and 35. The former invades the maternal endometrium to form the short-lived endometrial cups, the hormonal product of which, eCG, supports progesterone production by stimulating the development of accessory corpora lutea. The non-invasive trophoblast develops an increasingly complex interdigitation with the luminal epithelium of the endometrium to form the diffuse epitheliochorial-chorioallantoic placenta that provides haemotrophic sustenance for the fetus until term. The placenta also synthesizes appreciable quantities of steroid hormones utilizing fetal gonad sources of C-19 androgens for aromatization to estrogens and a combination of maternal and fetal adrenal gland sources of pregnenelone for conversion to 5α-dihydroprogesterone and other 5α-reduced progestagens.

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