HORMONAL REGULATION OF A PREGNANCY IN A MARE



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by
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FERTILIZATION
Takes place in the oviduct and it is possible up to 10 hours after ovulation:

Transport of the egg through the oviduct to the uterus takes about 6 days.
The embryo (spherical form) migrates freely through the uterine lumen during 17 days after ovulation.

MAINTENANCE OF THE PREGNANCY
For early pregnancy maintenance:
The endometrium must be in good condition to prevent the physical movement of the embryo without barriers.

¢For some mares mechanism suppressing the normal regulation of oxytocin receptors in the endometrium cyclical upturn , and prevent the release of luteolytic prostaglandin PGF2a in response to oxytocin .

¢Corpus Luteum: not Luteolysis (14-16 days). The corpus luteum is maintained and release progesterone during the next 20 days.

¢The supply of progesterone also completed with additional corpus luteum induced by chorionic gonadotropin.

¢Between days 25 and 35 after ovulation, trophoblast cells begin to multiply.

¢About 36 to 38 days, they migrate deep into the maternal endometrium to form structures endometrial cups. (Horses only)

-These are secretory and play a crucial role in the maintenance of pregnancy until the placenta can provide enough progesterone for itself in about 100 days.

-Large amounts of equine chorionic gonadotropin (eCG) is produced and secreted by endometrial cups between days 40 and 70 of pregnancy.

¢In conjunction with the pituitary FSH , eCG stimulates the development of accessory corpora lutea, providing an additional source of progesterone.
¢Day 70 of gestation, endometrial cups begin to degenerate and reduce levels of eCG
¢Around 100 to 120 days, the necrotic cups off and left free the uterine lumen, where the lodge to form allantochorion call allantochorionic bag.
¢Not until as late as 40 days after ovulation the trophoblast begins to establish a connection with the microvilli endometrial luminal epithelial cells.
¢ The exchange unit of the primary haemotrophic allantochorionic noninvasive placenta, the microcotyledon, consists of 120 days of pregnancy.

HORMONAL ADAPTATION TO PARTURITION
Occurs at a specific time that matches two facts :
1) the full maturity of the fetus
2) the decline of the placenta (beginning to be insufficient).

When the secondary corpus luteum stops producing progesterone, maternal progesterone levels reach very low levels in the last third stage metabolites of progesterone and pregnenolone ---->quiescence of the myometrium
The last 20-30 days of gestation, total progesterone levels increase and reach a peak 48 hours before delivery.
Only very close to delivery (during the last 24 to 48 hours) that these levels show a sharp decline.

1.The onset of labor would be given by an increase in the release of ACTH (adeno fetus) that stimulate the release of cortisol from the adrenal cortex. Cortisol acts at the placenta for placental 17-hydroxylase, which metabolizes progesterone to estrogen, inducing an increase in the estrogen / progesterone maternal relationship.

2.Adrenocortical differentiated and become activated by the increased prenatal fetal ACTH , pregnenolone changes cortisol production and this seems to be responsible for the final precipitous drop in progesterone levels in maternal plasma .

3.Estrogen levels decrease the last 100 days of gestation reaching low levels at birth , though this is largely a reflection of the reduction of estrone and equilin estrogens and equilenin specific species , because the concentrations of estradiol - 17B remain fairly constant

4. Over the last 24 to 48 hours before delivery, concentrations of estradiol -17B maternal duplicated again.

5. Levels of maternal prostaglandins only show a sharp increase in labor (due to primary prostaglandins)

6. While its conversion into metabolites is inhibited under the influence of very rapid change of balance of progestin / estrogen.