and (0.34 ± 0.09, n = 10 ♂; 0.30 ± 0.11, n = 11 ♀ ng/ml), respectively. After birth, neonatal progesterone on day 4 (3.54 ± 0.28, n = 6 ♂; 2.45 ± 0.24, n = 4 ♀) ng/ml and estrogen by day 6 [1] decreased considerably. Simultaneously, the mean levels of LH for males (1.22 ± 0.12; p < 0.001) and females (1.36 ± 0.16; p < 0.001) increased significantly compared to fetal levels. Pulse frequency and amplitude also increased in the female (0.83 ± 0.14, p < 0.003 p.f/h; 1.9 ± 0.18, p < 0.001 p.a.), while the male pulse frequency was augmented (0.95 ± 0.12; p < 0.001) but pulse amplitude (0.63 ± 0.06) remained unchanged.

In conclusion (1) the adenohypophysis of the pig releases LH episodically from the fetal age of day 81 onwards, which is consistent with previous work in this laboratory involving LHRH-application or electrical stimulation of the hypothalamus on LH-secretion. (2) High levels of progesterone and/or estrogen in the fetal compartment may have a suppressive effect on LH-secretion.

References
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175. The pulsatile pattern of gonadotropin secretion and follicular development during the follicular phase of the menstrual cycle and during the midcycle surge

L. Wildt, I. Hebold, G. Leyendecker, Universität-Frauenklinik Bonn

Amplitude and frequency of pulsatile gonadotropin secretion change during the menstrual cycle. The dynamics and temporal aspects and the physiologic significance of these changes are incompletely understood, and there is some controversy as to whether or not an increase in LH pulse frequency occurs before or during the preovulatory surge. In this study we therefore examined the pattern of pulsatile gonadotropin secretion during the follicular phase of the cycle and during the midcycle surge. Follicular development was followed by ultrasonography.

Blood samples were collected from 6 women every 15 min for 8-hour periods 24–72 hours apart, beginning on day 1 or 2 of the cycle until after ovulation. At each sampling period the number and size of ovarian follicles were determined by ultrasonography. Additional subjects were studied daily in the same manner from the time the dominant follicle had reached a diameter of 1.8 cm until after ovulation. A total of 43 profiles over 8 hours was obtained and analyzed for LH, FSH, prolactin, estradiol and progesterone concentrations.

LH and prolactin showed clear evidence of pulsatile secretion while pulses of FSH were observed on occasion. LH pulse frequency increased during the first 4–6 days of the follicular phase from one pulse every 140 min to one pulse every 90 min, on the average, but remained unchanged thereafter until after ovulation. No increase of LH pulse frequency was observed during the midcycle surge. The amplitude of the LH pulses was high during the early follicular phase and during the midcycle surge. The decrease of LH pulse amplitude during the midfollicular phase coincided with the appearance of the dominant follicle which became identifiable at a diameter of 1 cm, and a decrease in the number of smaller follicles. This was associated with a rise of estradiol and a decline in circulating FSH levels which remained suppressed until the onset of the midcycle surge. Pulses of prolactin were observed concomitantly with those of LH, and the amplitude of the prolactin pulses appeared to be higher at midcycle.

The results of this longitudinal study fail to demonstrate significant changes of LH pulse frequency after the early follicular phase of the cycle and therefore do not support the view that the midcycle surge is the consequence of an increase in the frequency of pulsatile gonadotropin or GnRH release. Taken together with the results of an earlier study from our laboratory [1] they suggest that the change in frequency of pulsatile LH release during the menstrual cycle is the consequence of luteal progesterone secretion, while the amplitude of LH pulses is determined by estradiol during the follicular phase and by estradiol and progesterone during the luteal phase of the cycle.

References