STUDIES ON PLASMA PROGESTERONE IN COWS ASSOCIATED WITH OVARIAN CHANGES FOLLOWING ENUCLEATION OF THE PERSISTENT CORPUS LUTEUM

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The removal of the persistent CL by enucleation is a widely used treatment which results, in many instances, in restoring the oestrous cycle, although a relatively high incidence of subsequent cystic changes in the ovary has also been reported (Purse & Wickersham, 1969).

Out of about 200 Fresian cows, six were selected in which the cyclic CL persisted for a period of over 30 days. The persistent CL were enucleated per rectum according to the technique of Hammond (1927). Care was taken not to let the CL slip into the ovarian bursa. For 25 days after enucleation, the ovaries were daily examined per rectum, signs of oestrus were recorded, and blood samples were collected. Plasma progesterone was determined by a protein-binding procedure (Barcikowski & Stupnicki, 1971).

Plasma levels of progesterone before enucleation ranged from 5 to 15 ng/ml. Within 1 to 3 hr after enucleation, there was a sharp drop to values below 1 ng/ml.

In two cows, signs of oestrus were noted on Day 5 after enucleation and again 20 days later. The plasma progesterone levels (Text-fig. 1a) were typical for a normal oestrous cycle (Dobrowolski, Snochowski & Staszkiewicz, 1973).

The remaining four cows displayed no signs of oestrus throughout the entire period of observation. In all these cows, follicular cysts (follicles larger than 15 mm in diameter) were found at autopsy. In one of them (Cow 79), the left ovary contained a follicular cyst, together with a luteal cyst with a cavity of over 20 mm in diameter.

Progesterone levels in cows which had only follicular cysts rose significantly (P<0.05) from 1.28±0.28 ng/ml during the first 2 days to 2.23±0.23 ng/ml between Days 3 and 5 after enucleation but decreased gradually thereafter. The source of this augmented secretion was probably the cells lining the wall of the developing cyst.

Although the plasma LH levels in cows with cysts were lower than in those in which oestrus followed removal of the CL (R. Stupnicki, A. Madej and W. Dobrowolski, unpublished data), they were not coincident with the transient increase in the progesterone level, which, according to Wagner, Strohbehn & Harris (1972), might result in suppressing the secretion of LH.

In Cow 79, elevated progesterone levels were observed from Day 5 onwards,
TEXT-FIG. 1. Concentration of progesterone in peripheral blood plasma of cows after enucleation of the persistent corpus luteum. Enucleation was performed at zero-time. Arrows indicate the time of observed oestrus. (a) Cows with regular cycles (Cow 170, solid line; Cow 161, dashed line). (b) Cows with follicular cysts (Nos 60, 70 and 92, solid line); mean values obtained from three cows ± S.D. (vertical bars), and one cow with both follicular and luteal cysts (Cow 79, dashed line).

with a sharp peak occurring on Day 11. The low basal levels were observed again from Day 15 onwards (Text-fig. 1b). A possible explanation for this finding is that the persistent CL could have been incompletely removed. Subsequent partial regeneration eventually led to the formation of a cyst.

REFERENCES


Plasma progesterone and platelet CL in cows

