

Brief Communication

EFFECT OF HYSTERECTOMY ON THE POSTPARTUM
PROSTAGLANDIN LEVELS IN THE COW

In the pregnant cow prostaglandin $F_{2\alpha}$ plays an important role in placing parturition in time. Elevated prostaglandin $F_{2\alpha}$ levels have been recorded in conjunction with the prepartum progesterone drop, during the delivery and for a considerable time period postpartum (*Edqvist et al.* 1978). The postpartum prostaglandin levels are elevated for about 14 days and seem to play a role for the uterine involution (*Lindell et al. in press*). It is assumed that this massive postpartum prostaglandin release originates from the uterus and reflects tissue damage (*Lindell et al.* 1980/81). In order to further verify the source of the postpartum prostaglandin release hysterectomy has been performed in a newly delivered cow.

One cow of the Swedish Friesian Breed (SLB) was subjected to hysterectomy on the second day after an uncomplicated parturition. The cow was treated with a tranquilizer, Rompun, (Bayer) and premedicated with atropin. After an intravenous injection of barbiturate, a tracheal tube was inserted and the anesthesia was continued with Fluothane (ICI). The operation was performed with the animal lying on its back. The udder was divided along its midline septum and the abdomen was opened in the linea alba. The uterus including the cervix was removed after multiple ligations of the uterine vessels. The ovaries and the supporting blood vessels were left intact. After the surgical intervention the cow was treated with antibiotics intramuscularly for a period of 10 days.

Jugular vein blood samples were collected from about 2 weeks before to 4 months after delivery. The blood samples were analyzed for the content of progesterone and the main blood plasma metabolite of $PGF_{2\alpha}$, 15-keto-13,14-dihydro- $PGF_{2\alpha}$ respectively, using radioimmunoassay systems (*Kindahl et al.* 1976 a). The results are shown in Fig. 1.

The removal of the uterus caused a rapid decrease of the prostaglandin metabolite levels to low basal concentrations. This indicates strongly that the uterus is the main source for prostaglandin production in the postpartum cow. The rapid decline of

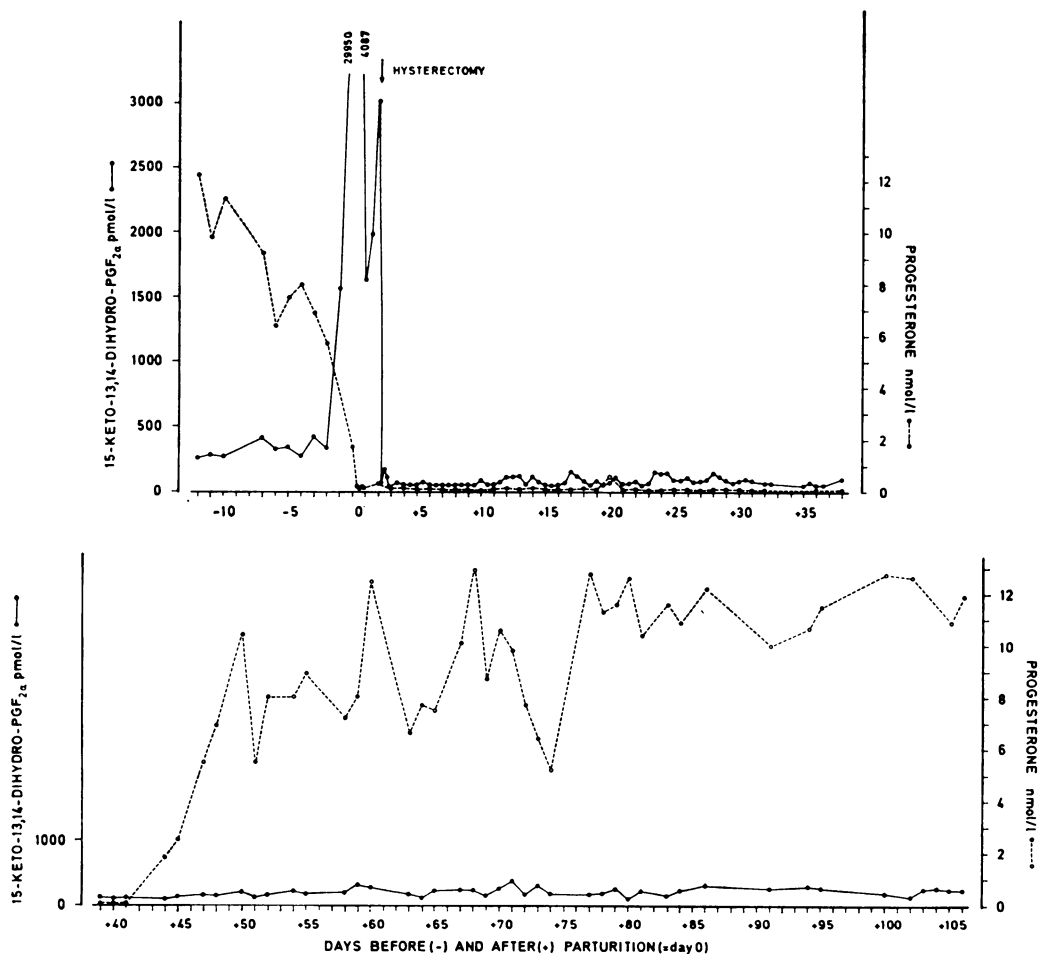


Fig. 1. Peripheral plasma levels of progesterone (\circ — \circ) and 15-keto-13,14-dihydro-PGF_{2 α} (\bullet — \bullet) in a cow subjected to hysterectomy at day 2 after normal parturition.

the prostaglandin metabolite level agrees with its short biological half-life, being about 8 min (Kindahl *et al.* 1976 b).

The cow ovulated at day 39 after delivery and formed a corpus luteum as indicated by the elevated progesterone levels. The corpus luteum was retained fully functional during the rest of the observation period. The arrest of the corpus luteum function is due to the hysterectomy, removing the source of the luteolysin. This is in agreement with previous studies on hysterectomy in cattle (e.g. Wiltbank & Casida 1956).

From the present study it can be concluded that the massive postpartum prostaglandin release in the cow originates from the uterus. Furthermore, removal of the uterus did not prevent ovulation but abolished estrous cyclicity and resulted in retained corpus luteum function.

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