

77. A ROLE FOR PLATELET-ACTIVATING FACTOR IN LUTEOLYTIC PGF_{2α} PRODUCTION BY THE OVINE ENDOMETRIUM

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Pulsatile release of endometrial prostaglandin F_{2α} (PGF_{2α}) induces luteolysis in ruminants (1). It has long been known that this pulsatility is driven by the pulsatile release of ovarian oxytocin, and that the two mediators form a positive feedback loop (2). However, several studies have shown that pulsatility persist in the absence of either the ovary, corpus luteum or pituitary (2, 3). It was hypothesized that uterine PGF_{2α} pulses are generated by a uterine loop of platelet-activating factor (PAF) signaling (4). PAF induces a uterine sex-steroid dependent PGF_{2α} response that is augmented by oxytocin and inhibited by embryonic interferon tau (4). The aim of this study was to investigate whether the maturation of a uterine PAF signaling loop in the ovine endometrium occurs at the time that PGF_{2α} pulsatility is first observed. Caruncular endometrium and uterine luminal fluids were collected from ewes on days 10, 12, 14 and 16 of the estrous cycle. The PAF content in tissue and the amount released into media increased significantly ($P < 0.01$) between days 10–16. PAF-receptor mRNA increased in a steroid-dependent manner, with immunolocalisation of the PAF-R protein showing that it was present in stratum compactum stroma and glandular epithelium. By day 14 there was a marked increase in PAF:acetylhydrolase activity in the luminal fluids ($P < 0.001$) and endometrial tissue ($P < 0.05$). Plasma PAF:acetylhydrolase protein immunolocalisation showed that it was present in the lumen of the glandular epithelium. This may serve to prevent accumulation of PAF outside of endometrial tissue. This study shows that the components of a localized loop of PAF signaling were assembled in the ovine endometrium at the time that the onset of uterine PGF_{2α} pulsatility was expected.

(1) McCracken, J.A., *et al.* (1972). PGF 2 identified as a luteolytic hormone in sheep. *Nature* **238**(83): 29–34. (2) Silvia, W.J. and Raw, R.E. (1993) Regulation of pulsatile secretion of PGF_{2α} from the ovine uterus by ovarian steroids. *J. Reprod. Fertil.* **98**(2): 341–7. (3) Denamur, R.J., *et al.* (1973) Pituitary control of the ovine corpus luteum. *J. Reprod. Fertil.* **32**(2): 207–20. (4) Chami, O., *et al.* (1999) PAF may act as an endogenous pulse generator for sheep of luteolytic PGF_{2α} release. *Am. J. Physiol.* **276**: E783–92.