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PLATELET-ACTIVATING FACTOR DOES NOT STIMULATE THE IN VITRO CONTRACTILE ACTIVITY OF THE PREGNANT SHEEP MYOMETRIUM NEAR TERM

Garcia-Villar, R.*, Parks, J.E.^{1*}, Hough, S.R.* and Nathanielsz, P.W. Laboratory for Pregnancy and Newborn Research, College of Veterinary Medicine and Department of Animal Science, Cornell University, Ithaca, NY 14853-6401 HD 21350.

AIM OF THE STUDY: In women and several animal species platelet-activating factor (PAF) has been reported to stimulate myometrial contractility thus contributing to parturition. The sheep has been extensively investigated to study control of myometrial activity at different stages of pregnancy. There are no data on the effects of PAF on myometrial contractility either in vivo, or in vitro, in this important experimental species. The present study was aimed at determining the effects of PAF on uterine muscle strips from pregnant sheep in vitro.

METHODS: Strips of uterine muscle (0.4 x 0.8 mm) from seven sheep at 120-145 days gestation age were superfused in vitro with 37°C oxygenated Krebs buffer, with or without 3 µM indomethacin. Contractions were recorded with strain gauges under a resting tension of 1 g and automatically quantified. Cumulative concentration-response curves (CRCs) to PAF (0.01 mM to 1 µM), oxytocin (4.2 pM to 42 nM) and prostaglandin (PG)F_{2α} (1 nM to 100 µM) were constructed using duplicate data points for each drug concentration in each animal. Wherever possible EC50 values were calculated. PAF superfusion effluents were collected for a bioassay of PAF based on [³H]serotonin release for equine platelets.

RESULTS: All myometrial strips displayed a regular pattern of spontaneous contractions about 1 min duration at 2-3 min intervals. As expected, both oxytocin and PGF_{2α} consistently stimulated myometrial activity in a concentration-related fashion. The EC50 value for PGF_{2α} (19 nM) was significantly (p < 0.01) lower than that for oxytocin (0.18 nM). In contrast, despite a wide range of concentrations and different experimental conditions, which included synthetic PAF (1-O-hexadecyl and 1-O-octadecyl, Sigma) with and without 2.5% BSA and HPLC-purified PAF from bovine sperm, PAF was without effect on myometrial contractility in any of the tissue preparations. Bioassay of superfusion effluents demonstrated that PAF remained biologically active during the course of the experiment.

CONCLUSION: Our results indicate that in-vitro muscle strips from late-pregnant sheep myometrium which are dose-dependently contracted by both PGF_{2α} and oxytocin, are not stimulated by bioactive PAF, thus suggesting that PAF may not be directly involved in the stimulation of uterine contractility in sheep in contrast with data reported for other species.

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