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Effect of $\text{PGF}_{2\alpha}$ receptor antagonist on prostaglandin production and COX-2 protein expression in bovine endometrial epithelial cells

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Statement of the Problem: Prostaglandins (PGs) play an important role in regulation of estrous cycle, recognition of pregnancy and implantation in ruminants. The first limiting step in the generation of PGs is the transformation of arachidonic acid by cyclooxygenases-1 and -2 (COX-1, -2). The downstream enzymes, prostaglandin E synthase (PGES) and prostaglandin F synthase (PGFS) catalyze the conversion of PGH₂ into PGE₂ and PGF_{2 α} , respectively. PGF_{2 α} acts as the luteolytic agent to control estrous cycle whereas PGE₂ helps in implantation and maintenance of pregnancy. PGF_{2 α} exerts its autocrine/paracrine action by binding to its receptors to mobilize intracellular Ca²⁺ and IP₃. Activation of FP receptors by PGF_{2 α} results in phospholipase C activation, inositol triphosphate hydrolysis and intracellular calcium flux. Pharmacological inhibition of FP receptor antagonist (AL 8810) has been found to decrease PGE₂ production in human endometrial cells treated with IL-1 β . The purpose of this study is to explore the effect of PGF_{2 α} receptor antagonist on prostaglandin production and protein expression in bovine endometrial epithelial cells.

Methodology & Theoretical Orientation: Endometrial epithelial cells at the stage of confluence were incubated with vehicle and FP receptor antagonist (AL 8810) for 30 min. Thereafter the cells were stimulated with vehicle, OT, IFN and OT+IFN in absence and presence of AL8810 for 6 hours.

Findings: Oxytocin had been found to increase the production of PGF_{2 α} in cultured cells in presence of both 10 μM and 25 μM AL 8810 but production was more with 10 μM AL 8810 treatment group. Similarly, OT increased PGE₂ production in presence of 10 μM AL 8810 in epithelial cells. The expression of COX-2 protein increased by treatment of AL8810 in presence of OT and OT+IFN but decreased in presence of IFN alone.

Conclusion & Significance: Production of prostaglandin and COX-2 expression are modulated by PGF_{2 α} receptor antagonist.

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