The involvement of peroxisome proliferator activated receptors (PPARs) in prostaglandin F2α production by porcine endometrium

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Abstract

In the present study, we investigated the in vitro effects of peroxisome proliferator activated receptor (PPAR) ligands on PGF2α secretion and mRNA expression of prostaglandin F synthase (PGFS) in porcine endometrial explants collected on days 10–12 and 14–16 of the estrous cycle or pregnancy. The explants were incubated for 6 h with: PPARα ligands – WY-14643 (agonist) and MK 886 (antagonist); PPARβ ligands – l-165,041 (agonist) and GW 9662 (agonist); PPARγ ligands – 15d-prostaglandin J2 (PGJ2, agonist), rosiglitazone (agonist) and T0070907 (antagonist). The expression of PGFS mRNA in the endometrium and the concentration of PGF2α in culture media were determined by real time RT-PCR and radioimmunoassay, respectively. During the estrous cycle (days 10–12 and 14–16), the agonists – WY-14643 (PPARα), l-165,041 (PPARβ), PGJ2 and rosiglitazone (PPARγ) – increased PGF2α secretion but did not affect PGFS mRNA abundance. During pregnancy (days 10–12 and 14–16), PPARα and PPARγ ligands did not change PGF2α release, whereas PPARβ agonist augmented PGF2α release on days 14–16 of pregnancy. In addition, WY-14643 and l-165,041 increased PGFS mRNA level in both examined periods of pregnancy. PPARγ agonist (PGJ2) and antagonist (T0070907) enhanced PGFS mRNA abundance in the endometrium on days 10–12 and 14–16 of pregnancy, respectively. The results indicate that PPARs are involved in the production of PGF2α by porcine endometrium, and that the sensitivity of the endometrium to PPAR ligands depends on reproductive status of animals.

Keywords

PPARα; PPARβ; PPARγ; Prostaglandin F synthase; Reproduction