

Effect of Prostaglandins on Preimplantation Bovine Embryos

RM Pereira, CC Marques, MC Baptista, MI Vasques and
AEM Horta

Estação Zootécnica Nacional – INIAP, Vale de Santarém, Portugal

The role of prostaglandins (PG) in preimplantation embryo development remains controversial. In this study, the effects of prostaglandins on *in vitro* bovine embryos were evaluated by blocking endogenous PG synthesis with indometacin (I; 28 μM) and adding different PG (PGE2, PGF2 α , PGI2 or PGE1, 1.4×10^{-7} M). Abattoir-derived oocytes were matured (TCM199+10% serum+10 $\mu\text{g mL}^{-1}$ FSH) and fertilized *in vitro* (IVF = D0). Presumptive zygotes were randomly allotted into four groups either in experiment 1 (Control n = 647, I n = 662, I+PGF2 α n = 649, I+PGE2 n = 651) or experiment 2 (Control n = 461, I n = 452, I+PGE1 n = 465, I+PGI2 n = 465) cultured in TCM199+10% serum and granulosa cell monolayers until D12-13 of embryo development. Data from 10 sessions of each experiment were analyzed using χ^2 and Fisher's exact test. In both assays, indomethacin impaired D8 embryo quality ($p < 0.001$) and reduced hatching rates in 18–19.9% ($p < 0.01$). Compared to control, cleavage rates were enhanced in 4.8 and 5.6% by I+PGE2 and I+PGE1, respectively ($p = 0.05$). Moreover I+PGE2 diminished in 6.9% D8 embryo rates ($p = 0.004$) and I+PGF2 α decreased 15.4% of D8 good embryos (grade 2, $p = 0.02$) and increased 22.2% of worse quality embryos (grade 4, $p = 0.002$). On the other hand, PG from E series overcame the negative effect of indomethacin on hatching rates. Results indicate that PG are essential for bovine preimplantation embryonic development, presenting different effects according to sequential stages of development (cleavage, D8 embryos, embryo hatching).