Animal Reproduction

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OPU-IVF and ET

Human chorionic gonadotropin has long-lasting effects on bovine corpus luteum function.

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Resumo

It was recently proposed that ovulation induction with hCG increases pregnancy rate in dairy cows after embryo transfer (ET) of in vitro-produced embryos, compared to GnRH (55 vs. 26.7% P/ET) (Garcia-Ispierto et al., Reprod Dom Anim, 56: 1145-47). The aim of the present study was to evaluate the effects of hCG on bovine CL function. The procedures were approved by the Ethics Committee for Animal Experimentation from UFPel (CEEA 31587-2020). In experiment 1, to evaluate whether hCG would allow ovulations and P4 synthesis in anestrous cows, Jersey and Holstein cows (n=6) were immunocastrated with two injections of anti-GnRH vaccine (Zoetis, Brazil) thirty days apart. When the cows had only follicles smaller than 4 mm, they received an intravaginal device (IVD) containing 1 g P4 (Agener União, Brazil) on D0 and 830 IU of eCG (Zoetis, Brazil) i.m. on D0 and D2. On D6.5, ovulation was induced by administering 1250 IU of hCG and IVDs were removed. Blood samples were collected on days 6.5, 9, 11 and 14. In experiment 2, to evaluate if hCG treatment would enhance luteal function in cyclic cows, non-pregnant and non-lactating Jersey and Holstein cows were treated with the following protocol: IVD containing 1 g P4 and 2 mg of estradiol benzoate (Agener União, Brazil) i.m on D0. On D8, 482 µg of PGF (Agener União, Brazil) were administered and, on D9, IVDs were removed. After 24 h, 10.5 µg of buserelin acetate (Ourofino, Brazil) (hour 0 = H0) was administered i.m. to cows with follicles ≥ 11 mm. Then, 16 h after GnRH, cows were allocated, according to follicular diameter, to two groups: control (n=5), without any additional treatment; and hCG (n=5), which received 1000 IU of hCG i.m. Ovulation was confirmed and, on days five and seven after GnRH, CL vascularization was assessed using color Doppler and blood was collected for P4 analysis. The data were evaluated using paired Student's T test. In experiment 1, four cows responded to eCG treatment (at least one follicle larger than 10 mm). The four cows responded to hCG treatment and ovulated, which was confirmed by P4 concentrations above 20 ng/ml seven days after hCG administration (D14), indicating functional CL. In experiment 2, hCG treatment did not affect CL vascularization, diameter, and circumference. However, hCG-treated cows presented greater P4 concentration seven days after GnRH treatment, being observed 2.7±0.7 and 4.1±0.9 ng/mL for control; and 3.7±0.8 and 8.5±2.6 ng/mL for hCG, on days 5 and 7, respectively (group: $P<0.05$; day: $P<0.01$; group x day: $P=0.1$). In conclusion, hCG treatment has long-lasting effects on bovine CL function because it induced ovulation and maintained luteal function for seven days in immunocastrated cows and increased P4 synthesis in cyclic cows.

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