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FOLLICULOGENESIS, OOGENESIS AND SUPEROVULATION

Effects of hCG administered by different routes seven days after onset of estrus in synchronous estrus induced acyclic dairy goats

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Considering important effects of hCG administration by intramuscular (i.m.) route on progesterone and pregnancy (Rodrigues *et al.*, 2022), this study checked if intrauterine route could provide similar hCG serum levels as well as i.m. route in dairy goats during non-breeding season. Mature goats (n = 44; body weight of 56.5 ± 1.5 kg; body condition score of 3.0 ± 0.2) had synchronous estrus induced by intravaginal sponges (60 mg of medroxyprogesterone acetate; Progespon®, Zoetis, São Paulo, Brazil) for six days plus 200 IU of equine chorionic gonadotropin (eCG; Foli-rec 7000®; Zoovet, Santa Fé, Argentina) and 131.5 µg of cloprostenol (Sincrocio®, Ouro Fino, Cravinhos, Brazil) i.m. 24 h before sponge removal. Estrus was checked, females bred with fertile males (D0 = Day of first mating) and CL checked by transrectal ultrasonography on D7. Goats with viable CLs (n = 35) were assigned to three groups: goats that received 300 IU of intrauterine transcervical hCG (hCG-IU; n = 12) or i.m. hCG (hCG-IM; n = 11) injections or 1 mL of saline solution (control; n = 12) i.m. on D7. Blood samples were collected from all animals via jugular vein puncture before hCG administration, 12 h after, and on days 8, 10, 13, 17, and 21 between 6-7 am. Serum was stored at -20°C and analyzed by solid-phase radioimmunoassay (RIA - hCG Kit, Irma Kit, Immunotech, Prague, Czech Republic). Statistical analysis (BioEstat 5.3, Belém, Brazil; IBM SPSS Statistics, version 19) used general linear model with repeated measures over time applied to data collected between days. Non-parametric data were analyzed by the Kruskal-Wallis test followed by Dunn's post hoc; for parametric data, ANOVA followed by Tukey's post hoc was applied. Frequencies were assessed by the Chi-square or Fisher's exact test. Four goats from the hCG-IU group were not considered in the study because cervical transposition was not possible. In all studied animal groups, mean circulating hCG concentrations did not differ (P > 0.05) on D7. In the hCG-IM group, hCG concentrations increased on D7.5, remaining so until D8 and decreased from D8 to D10, (P < 0.05) and thereafter, there was no difference (P > 0.05) between groups. Control goats tested positive for hCG. Pregnancy rates on D30 and 60 were similar (P > 0.05) between hCG-IM (91.0% or 10/11) and control (83.0% or 10/12) groups, and both groups were superior (P < 0.05) when compared to hCG-IU group (25.0% or 2/8). Intramuscular route should be considered as preferential for sustained increase in hCG levels over the measured days not disturbing pregnancy. The fact of control goats testing positive for hCG suggests the possibility of the cross-reactivity of RIA hCG antibodies with LH, r-eCG, or another unidentified molecule associated with early pregnancy in goats.