THE ADMINISTRATION OF hCG OR GnRH INDUCE THE FORMATION OF ACCESSORY CORPORA LUTEA

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The aim of this study was to evaluate the effect of the administration of hCG or GnRH at day 4 post fixed-time artificial insemination (FTAI) on the formation of accessory corpora lutea (acc-CL) and the concentration of serum progesterone (P_4) in sheep. Multiparous adult Merino ewes (n=36) were treated for estrus synchronization using two intramuscular (i.m.) injections of prostaglandins (PG, 125 µg Cloprostenol, Cyclase®, Syntex, Argentine) with an interval of 14 days. At 53-56 h after the second PG application, FTAI was performed vaginally with a dose of 100 million spermatozoa of fresh semen. The ewes were assigned randomly to three groups on day 4 post FTAI: GnRH group (n= 12) received 4 µg i.m. of GnRH analogue (Buserelin. Receptal®, Intervet, Argentine), hCG group (n= 12) received 300 IU i.m. of hCG (Gonacor®, Ferring, Argentine) and Control group (n= 12) received 1 ml i.m. of saline solution. Two laparoscopic examinations were performed at day 4 and 10 post-FTAI. In the first observation, we determined the number and distribution of post ovulation corpora lutea (po-CL) and the number and diameter of follicles present in both ovaries. In the second laparoscopy, we observed the number of po-CL and acc-CL. The sizes of the follicles that generated the acc-CL were determined according to the position of the follicles observed in the first laparoscopy. Blood samples were collected from the jugular vein at 4, 7, 10, 13, 17 and 21 days post FTAI. Serum concentration of P_4 was determined by chemiluminescence (Elecsys®, P_4; Roche, Germany). A similar follicular population in number and size was observed in the three experimental groups before the beginning of treatments (Follicles 2 mm: 6.4 ± 3.7, 3 mm: 3.0 ± 2.3, 4 mm: 1.1 ± 0.5, 5 mm: 1.4 ± 0.8; $P>0.05$). The formation of one acc-CL was only observed in GnRH and hCG treated animals ($P<0.05$). The acc-CL induced by the hormonal treatments were generated from follicles of 3, 4 or 5 mm and did not differ between both treatments ($P>0.05$). The hCG group had higher mean concentrations of P_4 on days 7, 10, 13 and 17 post FTAI (4.1 ± 1.3, 10.5 ± 2.0, 9.4 ± 1.9, 7.4 ± 2.1 ng/ml, $P<0.05$) compared with the GnRH group (2.3 ± 1.1, 5.6 ± 2.5, 5.6 ± 2.9, 5.7 ± 1.8 ng/ml) and the Control group (2.5 ± 1.1, 5.3 ± 4.5, 2.0 ± 3.2, 4.8 ± 2.5 ng/ml), while no differences were observed between these two latter groups. Mean P_4 concentrations showed no differences according to the size of the follicle which formed the acc-CL ($P>0.05$). Administration of hCG or GnRH at 4 days post FTAI induced the formation of acc-CL from follicles greater than or equal to 3 mm indistinctly. However, serum concentration of P_4 increased significantly only in the hCG group. Differences in the pharmacodynamics of these two hormones might induce corpora lutea with a different steroidogenic capacity to produce P_4. Further research should be done to assess the effect of these hormones on the histological and functional characteristics of po-CL and acc-CL.