Animal Reproduction

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Evaluation of hCG as a gonadotropic support to timed embryo transfer protocol in beef cattle

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Resumo

This study compared the reproductive performance of embryo recipients treated with a TET protocol employing hCG or eCG. Nulliparous/heifers (n=194, 18 Nelore and 176 crossbred Nelore x A. Angus) and multiparous cows (n=147, 75 Nelore and 72 crossbred Nelore x A. Angus) with BCS 3.0 to 4.0 were used in this study. On a random day of the estrous cycle (D-10) females receiving a TET protocol with EB (2mg, i.m., Gonadiol®, Zoetis, Sao Paulo, Brazil) and an intravaginal P4 device (CIDR®, Zoetis) that remained until D-8.5. On D-8.5, the animals receiving i.m. 150µg D-cloprostenol (Croniben®, Biogénesis Bagó, Curitiba, Brazil) and 1mg EC (ECP®, Zoetis) and then were randomly divided into two groups: eCG-group (n=179; i.m. treatment with 300IU eCG; Novormon®, Zoetis) and hCG-group (n=162; i.m. treatment with 150IU hCG; Vetecor®, Ceva, Paulinia, Brazil). Estrus intensity (sacrococcygeal painting) and diameter of the dominant follicle (DF) were monitored on D0 and CL Doppler evaluation (Pugliesi et al., 2019) was assessed on D7 to inovulation of the fresh embryo and in vitro produced. Then, pregnancy was assessed 23 days later. Data were analyzed by ANOVA using a mixed-effect model (gonadotropic treatment, category, breed, and estrus expression intensity) and the Tukey test. Rates were analyzed by logistic regression using the same variables as the previous model (P<0.1). There was no isolated breed effect or interaction (P>0.1). The diameter of the DF (mm) was influenced (P=0.01) by gonadotropic treatment*category interaction (eCG-multiparous 10.3±0.3a, eCG-nulliparous 10.4±0.3a, hCG-multiparous 10.7±0.3a and hCG-nulliparous 9.3±0.3b). Treatment with hCG and eCG showed a high estrus rate, but the proportion of females with high-intensity estrus was higher in the hCG group (79.8% vs 68.6%, respectively; P=0.03). The utilization rate was influenced (P=0.06) by gonadotropic treatment*category interaction (eCG-multiparous 88.9%a, eCG-nulliparous 81.3%ab, hCG-multiparous 82.7%ab and hCG-nulliparous 72.4%b). The hCG-group resulted in CL with a better Doppler evaluation score (1.83±0.08 vs 1.62±0.07; P=0.04), central blood flow (1.90±0.08 vs 1.65±0.07; P=0.03) and peripheral blood flow (2.16±0.08 vs 1.97±0.07; P=0.08) in relation to eCG-group. There was an interaction effect of gonadotropic treatment*category that revealed a lower conception rate (eCG-multiparous 40.3%ab, eCG-nulliparous 29.8%bc, hCG-multiparous 42.3%a and hCG-nulliparous 18.0%c; P=0.01) and pregnancy rate (eCG-multiparous 37.5%a, eCG-nulliparous 24.3%b, hCG-multiparous 37.3%a and hCG-nulliparous 13.8%c; P=0.001) in nulliparous treated with hCG. Treatment with hCG during the TET protocol resulted in greater estrus expression intensity and CL with a higher Doppler score, which determined rates of utilization, conception, and pregnancy similar to conventional protocols using eCG. However, the nulliparous category treated with hCG exhibited lower overall reproductive rates in the TET program.