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Effect of high density lipoprotein during *in vitro* oocyte maturation on initial embryo development in bovine

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High-density lipoprotein (HDL) is the only lipoprotein present in follicular fluid and is responsible for providing cholesterol for steroidogenesis. In addition, it has anti-inflammatory, antioxidant and cytoprotective properties, mainly derived from its lipid composition, apolipoprotein-AI and enzymes such as paraoxonase-1. In this sense, intrafollicular levels of HDL-cholesterol have been positively associated with improved embryonic quality in women. The aim of this study was to evaluate the effect of increasing doses of HDL during oocyte maturation *in vitro* on the initial embryonic development in cattle. The IVP was carried out in an incubator with 5% CO₂ at 39 °C using commercial media (Progest Biotecnologia em reprodução Animal, Botucatu, SP, Brazil). Cumulus oocyte complex (COCs) were obtained from slaughterhouse bovine ovaries, washed and selected for morphology. COCs of grade I, II and III were randomly distributed into three groups (n=50 COCs/group) according to the addition of HDL protein in the IVM medium (G0: 0 mg/mL; G1: 0.5 mg/mL; G2: 1.5 mg/mL HDL, SIGMA-ALDRICH®, St. Louis, MO, USA). IVM occurred for 22 hours. The IVF (day 0) was performed with a concentration of 1x10⁶ spermatozoa/mL for 20 hours. After this period, the presumptive zygotes were washed and cultured in IVC media covered with mineral oil for 7 days. On day 3 the cleavage rate (cleaved/inseminated) was evaluated and 70% of the culture media was renewed, which was repeated on day 5. On day 7 the rate of embryonic development (blastocysts/inseminated) was evaluated. Therefore, 9 replications were performed, totaling 450 inseminated COCs/group. The effect of HDL on the cleavage rate and embryonic development was analyzed through the repeated measures ANOVA followed by the Tukey post-hoc test. The highest dose of HDL had a negative effect on the cleavage rate (P=0.0003) and embryonic development (P=0.02). The cleavage rate from G0 (68.8%) and G1 (68.1%) was not different, but G2 cleavage rate (56.3%) was lower in comparison to the other groups (P<0.05). Likewise, the embryo development rate was not different between G0 (29.4%) and G1 (29.2%), but G2 (19.5%) had a lower development rate compared to the other groups (P<0.05). It is concluded that despite the antioxidant and cytoprotective properties of HDL, when in high concentrations it can negatively affect the initial embryonic development in cattle, since the higher concentration of HDL tested in this study decreased the cleavage and embryonic development rates.