Animal Reproduction

THEMATIC SECTION: 37TH ANNUAL MEETING OF THE BRAZILIAN EMBRYO TECHNOLOGY SOCIETY (SBTE)

OPU-FIV

Effect of the addition of melatonin to embryo culture media on the production of bovine embryos under high or low oxygen tension

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Melatonin has shown different benefits for cellular tissues and embryo culture system, such as: anti-apoptotic effects in the cells, modulates the expression of active substances, reduces calcium influx into the cells and attenuates the production of reactive oxygen species. Therefore, the aim of the present study was to investigate the effect of adding 10-9 M melatonin to *in vitro* culture (IVC) medium on blastocyst rate when cultured under high (20%) and low (5%) O2 tension. For this purpose, ovaries were collected from a slaughterhouse and transported to the laboratory for follicular puncture. The selected oocytes with homogeneous cytoplasm and at least three layers of *cumulus* cells were then subjected to i*n vitro* maturation (IVM) and *in vitro* fertilization (IVF) under high O2 tension. On the day of IVC, the putative zygotes were categorized into four groups: 1) High O2+Mel; 2) High O2-Mel; 3) Low O2+Mel; and 4) Low O2-Mel and cultured in synthetic oviductal fluid (SOF) with 2.5% fetal bovine serum. Means were compared by Tukey-Kramer test at 5% probability and quantitative data were expressed as mean ± standard deviation. No difference in cleavage rate was observed between all groups (p>0.05). Regarding *in vitro* embryo production, there were no differences between treatments in high O2 tension (41.25 ± 4.73% *vs* 37.41 ± 6.10%, respectively with and without melatonin; P>0.05) and in low O2 tension (34.48 ± 8.53% *vs* 30.34 ± 6.23%, respectively with and without melatonin; P>0.05). However, when the culture systems were compared, we observed that high O2 tension with melatonin produced more blastocyst than low O2 without melatonin (41.25 ± 4.73% *vs* 30.34 ± 6.23%), indicating that the presence of melatonin can influence the embryo development in low O2 tension culture system, despite being a system that produces fewer free radicals. Furthermore, the effect of melatonin on embryo quality still needs to be investigated in this study in future. This research was supported by CAPES, FAPDF and EMBRAPA.