Development in vitro and in vivo of aggregated parthenogenetic bovine embryos

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Abstract

Mature bovine oocytes were activated with 7% ethanol followed by cytochalasin B or D treatment. Most oocytes extruded a second polar body and formed one pronucleus when treated with 7% ethanol alone [35/43 (81%)]. With ethanol followed by cytochalasin B or D, overall activation frequency was 70% (309/441), with activated oocytes containing two pronuclei. The cleavage rate was not significantly different between treatment with ethanol alone and ethanol followed by 5 micrograms mL-1 cytochalasin B, but it was significantly lower than in fertilized oocytes ($P < 0.01$). However, the blastocyst production rate was significantly different ($P < 0.01$) among the treatments. The incidence of parthenogenetic embryos with normal (diploid) complements and with chromosome anomalies (2N/4N) was 68% (17/25) and 32% (8/25) respectively, and this was not affected by cryopreservation treatment. The longitudinal diameter of aggregated-four embryos cultured in vitro was greater ($P < 0.01$) than aggregated-two or single embryos. One of the aggregated-four parthenogenetic embryos was further cultured in vitro and developed up to Day 27 after activation, with a diameter of 2980 microns. The aggregated-four parthenogenetic embryos were transferred to five recipients. The oestrus was prolonged in three recipients and they returned to oestrus on Day 57, 62 and 67 after the previous oestrus. These results indicate that aggregating parthenogenetic embryos can prolong their survival in vitro and in vivo.

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