In vitro maturation of goat oocytes recovered during the non-breeding season

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The present study utilized a 2 x 2 factorial design examining the effects of gonadotropin stimulation (follicle stimulating hormone [FSH] vs. equine chorionic gonadotropin [eCG]) and medium supplementation (with or without alpha-tocopherol) on in vitro maturation rates of goat oocytes recovered during the non-breeding season. We hypothesized that follicular stimulation would not differ between gonadotropin treatments but oocytes incubated in medium supplemented with alpha-tocopherol would show increased rates of maturation compared to oocytes incubated in medium without it. Healthy does were randomly distributed into two groups: FSH (n = 8) and eCG (n = 5). A controlled intravaginal drug release (CIDR-G) device was inserted for six days starting at day 0. Animals received 10 mg dinoprost and a single dose of 160 mg FSH IM or 500 IU eCG IM 24 hours before CIDR-G removal (day 5). Follicular aspirations were performed by laparoscopic ovum pick-up 36 hours after gonadotropin treatments. For follicular punctures, an 18-gauge 3.5 inch long with a short bevel needle attached to a vacuum system with pressure not exceeding 60 mmHg was used. Oocytes were recovered into 50-mL centrifuge tubes with medium composed of PBS supplemented with 10 IU/mL of heparin and kept at 36°C. All recovered oocytes were placed into maturation medium (M199 with Earle’s salts) and incubated for 24 h. After incubation, oocytes were examined for the presence of the first polar body. Proportions of oocytes reaching maturation between and within experimental groups (FSH vs. eCG; with or without alpha-tocopherol) were compared using Chi-square and Fischer’s exact test whenever indicated, with significance set at P ≤ 0.05 and with a trend for significance set at 0.05<P≤ 0.1. The overall oocyte maturation rate was 40.63% (26/64). There was no effect of medium supplementation with (33.3%; 11/33) or without (48.4%; 15/31) alpha-tocopherol. Similarly, there was no effect of gonadotropin stimulation on oocyte maturation, FSH (43.2%; 19/44) vs. eCG (35%; 7/20). We conclude that addition of alpha-tocopherol to in vitro maturation medium did not improve oocyte maturation in does during the non-breeding season.

Keywords: Alpha-tocopherol, goat, gonadotropin, oocyte, laparoscopy