Update on foal production using oocytes collected from ovaries shipped postmortem in a clinical program
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Oocytes recovered postmortem are the last resource to obtain foals from a mare that suffers untimely death. We previously reported the clinical production of 10 foals via intracytoplasmic sperm injection (ICSI) of oocytes collected postmortem from ovaries of 16 mares (2006-2009). We have also briefly presented clinical postmortem ICSI results in relation to ovary shipping temperature and duration (20 mares, 2010-2012). In that study, there was a tendency for higher blastocyst formation but a lower pregnancy rate for oocytes from ovaries transported at 10-19°C than for those shipped at higher temperatures. Here we evaluate cases received in 2012-2014 to determine if that tendency was repeated. We categorized ovaries from 47 mares, 2-26 years of age, by ovary temperature at arrival: A) < 10°C (3-13 h transportation time, 2 mares); B) 10-19°C (6-9.5 h, 5 mares); C) 20-29°C (0.5-9 h, 22 mares); and D) 30-38°C (< 5 h, 18 mares). Packaging recommendation was that ovaries shipped < 2 h be packed with ballast near body temperature, and those shipped > 2 h be packed at room temperature or cooler (~13–22°C). Oocytes were collected by scraping of follicles, and matured oocytes were subjected to ICSI and cultured in vitro for blastocyst formation. Overall, 621 oocytes were collected from 938 follicles (13 oocytes per mare; 66% oocyte recovery rate per follicle). Of these oocytes, 63 were degenerating (10%) and 560 were cultured for maturation. The overall oocyte maturation rate was 49% (273/558); the rate of blastocyst development per injected oocyte was 20% (54/270). Out of 26 blastocysts transferred fresh, 10 foals were produced (38%). Eight blastocysts were vitrified, then warmed and transferred, for 5 foals (63%). Some vitrified blastocysts have not yet been transferred. When examined by category, oocyte maturation rates were 28, 50, 50, and 49% for Groups A, B, C, and D, respectively. Blastocyst rates per injected oocyte were 0 (0/5), 31 (11/35), 18 (24/132), and 19% (19/98), respectively; Group B tended to have a higher blastocyst rate than did Group C (P=0.07, Fisher’s exact test). The foaling rates for transferred embryos (fresh + vitrified-warmed) in Groups B, C and D were 71% (5/7), 47% (9/19) and 13% (1/8) (B vs D, P<0.05). These data show, surprisingly, that transport of ovaries for 6-18 h at 10 to 19°C resulted in higher foal production efficiency than did transport for < 5 h at 30 to 38°C.

Keywords: Equine, oocytes, intracytoplasmic sperm injection, embryo culture

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References