Use of intracytoplasmic sperm injection (ICSI) and in vitro culture (IVC) of embryos to the blastocyst stage for transcervical embryo transfer has seen increased clinical interest, but little information is available on results of these procedures in a commercial setting. We report here the results from the ICSI/IVC program at Texas A&M University for the 2013 breeding season (January 30 to May 31). Mares aged 3 to 30 years were presented for ICSI/IVC due to mare subfertility or low availability of semen. Oocytes were recovered by ultrasound-guided transvaginal follicle aspiration from all follicles ≥ 5 mm diameter, and were cultured in maturation medium for 30 h. Fresh or frozen-thawed semen from the stallion of the owner’s choice was used for ICSI as previously described [Choi YH, et al., Theriogenology. 2006;66:955-63.]

Presumptive zygotes were cultured in a modified commercial human embryo culture medium (LifeGlobal) and were evaluated for blastocyst development on Days 6 to 12. Blastocysts were transported by air to the embryo transfer center of the owner’s choice, or were vitrified for later transfer. Overall, 103 aspiration sessions were performed on 67 mares; 1604 follicles were aspirated (average 15.6 follicles/aspiration) and 877 oocytes recovered (55% recovery) for an average of 8.5 oocytes recovered per mare aspiration. Of the recovered oocytes, 39 (4%) were degenerating and one was lost; culture of the remaining oocytes yielded a 72% maturation rate (602/837), or an average of 5.8 mature oocytes per aspiration. Twelve mature oocytes were damaged during manipulation; ICSI and IVC of the remaining 586 oocytes yielded 119 blastocysts (20% per injected oocyte; average of 1.2 blastocysts per aspiration session). At least one blastocyst was produced in 57 of the 103 aspiration sessions. The number of sessions yielding 1, 2, 3, 4, 5, 6, 7 and 10 blastocysts were was 25, 19, 8, 1, 1, 1, 1, and 1. The number of oocytes recovered per aspiration decreased significantly with age (8.6, 11.0, 8.1, 6.6, 6.1 and 2.5 oocytes per mare aspiration for mares ≤ 10, 11-15, 16-19, 20-22, 23-24 and ≥ 25 years of age, respectively); however, the percentage of degenerating oocytes, oocyte maturation rate (67, 77, 63, 77, 72 and 70%, respectively) and blastocyst rate per injected oocyte (17, 23, 21, 18, 16 and 29%, respectively) did not differ significantly among age groups. Sixteen embryos were vitrified and 2 were lost during handling; 101 embryos were transferred for 82 pregnancies (82%). Of these, 16 (19.5%) had been lost, both before and after formation of the embryo proper, as of the time of writing. These results show that ICSI/IVC can be an effective means of producing embryos and pregnancies in a clinical setting.

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