In-vitro equine embryo production: an adventure in multi-unit collaboration

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The accessibility of assisted reproductive techniques related to oocyte collection and in vitro fertilization in the mare is increasingly becoming more widespread for private equine practitioners and their clients. The necessity of hauling a valuable mare long distances to the closest facility for transvaginal aspiration (TVA) of oocytes and on site intracytoplasmic sperm injection (ICSI) over a period of potential weeks before obtaining a pregnancy no longer exists. Instead, a mare's primary veterinarian can manage the patient's cycle and briefly transport her to a nearby facility where TVA can be performed. With TVA services being offered with increasing frequency in densely equine populated areas it is increasingly common for TVA to be offered as an outpatient procedure even if ICSI laboratories are not present at that location. The majority of reports associated with TVA and ICSI are associated with benchtop research and typically do not continue beyond blastocyst development to report pregnancy rates. A cumulative pregnancy rate after TVA and ICSI were performed on immature oocytes, with shipment of blastocysts to an off-site recipient herd has been reported at 72% with a 52% foaling rate.[1] In 2017, in collaboration with an exclusively equine reproduction veterinary practice, we worked together to provide TVA services for client-owned mares. Mares were referred from the veterinary practice to our university setting where outpatient TVA procedures were performed; 330 follicles were aspirated and 212 oocytes were recovered (mare age range from 4-26 years) and shipped overnight at room temperature in an Equitainer® to an ICSI laboratory via FedEx™. A total of 43 (26.1%) blastocysts resulting from 165 ICSI procedures were obtained; 29 embryos were vitrified for future use and 14 embryos were transported to the referring reproductive veterinary practice via courier for fresh transfer to recipient mares on day 7 or 8 after ICSI. A 14 day pregnancy rate of 71.4% (10/14) and a 50% (7/14) pregnancy rate at heartbeat check were recorded. Three recipient mares have already successfully foaled and four are due to foal later in the spring of 2018. In light of these results sending a mare to a local practice specializing in TVA, as opposed to a distant, self-contained facility that has both TVA and ICSI capabilities has benefits for referring equine practitioners, their clients and patients. Being a key element in the management of the mare's cycle prior to TVA has allowed the primary veterinarian to remain an integral partner in providing these specialty services. Shorter duration stays at referral facilities translates into less expense for the mare owner. Finally, as collaborators in this working partnership we have found working as a team to offer such services has enhanced the working relationship between practitioners and specialists.

Keywords: In-vitro embryo production, oocyte, ICSI, TVA, mare

Reference

1. Rader K, Choi YH, Hinrichs K: Intracytoplasmic sperm injection, embryo culture, and transfer of in-vitro produced blastocysts. Vet Clin North Am Equine Pract 2016;32:401-413.