Equine Postmortem Oocyte Recovery: A Retrospective Analysis

Jennifer N. Hatzel, DVM, MS, DACT*; Jessica Lederman, BS; and JoAnne Stokes, BS

A fifteen year retrospective evaluation of oocyte recovery from postmortem ovaries to create in-vitro embryos within a clinical program provides insight into success and recommendations for equine veterinarians. Authors’ address: Equine Reproduction Laboratory, Colorado State University, 3101 Rampart Road, Fort Collins, CO 80521; e-mail: Jenn.Hatzel@colostate.edu. © 2021 AAEP.

1. Introduction
Collecting equine oocytes from deceased mares for in-vitro embryo production through the use of intracytoplasmic sperm injection (ICSI) has been commercially available since 2005 and is considered an equine emergency. This retrospective analysis provides unique insight into clinical data from inception.

2. Materials and Methods
Data was collected from January 2005 through December 2020 and evaluated: the total number of oocytes collected, the number of oocytes reaching metaphase II compared to the total number collected (maturation rate), and the number of cleaved embryos and blastocysts to injected oocytes (cleavage rate and blastocyst rate). Utilizing the development of an embryo to the blastocyst stage as an endpoint, statistical comparisons were made evaluating timing from death, ovarian temperature upon arrival, and semen type. Statistical analysis was performed utilizing one-way ANOVA tests and significance established at P ≤ 0.05.

3. Results
In total, 168 sets of ovaries were evaluated yielding 1,524 oocytes. An overall maturation rate of 41% (620) was identified, cleavage rate of 40% (246), and blastocyst rate of 19% (117). There was a linear association between temperature on arrival of ovaries from deceased mares and the likelihood of obtaining an embryo that successfully develops to a blastocyst stage (P = 0.003). However, there was no association between transportation time and semen choice (P = 0.17 and P = 0.65, respectively).

4. Discussion
This is the first clinical retrospective analysis determining successful blastocyst development derived from equine postmortem ovary collections from a data set this large. Although often uncontrollable, referring veterinarians can improve successful outcomes by understanding the importance of variables such as temperature during transportation and make every effort to ship ovaries while maintaining temperatures between 15–25°C.

Research Abstract—for more information, contact the corresponding author

NOTES
Acknowledgments

Declaration of Ethics

The Authors have adhered to the Principles of Veterinary Medical Ethics of the AVMA.

Conflict of Interest

The Authors have no conflicts of interest.