

COMPETITION SESSION

Epididymal sperm granulomas are associated with antisperm antibodies in frozen-thawed donkey semen

Giorgia Podico,^a Yamilka Lago-Alvarez,^a Maria Ferrer,^b Igor Canisso^a

^aDepartment of Veterinary Clinical Medicine, College of Veterinary Medicine, University of Illinois Urbana-Champaign, Urbana, IL;

^bDepartment of Large Animal Medicine, College of Veterinary Medicine, University of Georgia, Athens GA

Prior to ejaculation, sperm is stored in the epididymis for a variable time; the blood-epididymis barrier regulates exchanges of nourishment and hormones while maintaining sperm isolation. The innate and adaptive immune system intervenes when sperm is extravasated in the interstitium. Although several conditions are known to affect the integrity of the blood-epididymis barrier (i.e. trauma, toxicants, parasites, and infections) in domesticated mammals, epididymal sperm granulomas and antisperm antibodies are a rare finding and have never been described in donkeys. This study aimed to describe and compare semen parameters (pre- and post-freezing) and antisperm antibodies of donkeys with epididymal sperm granuloma (Granuloma) and healthy controls (Control). Feral donkeys (n = 10) castrated in a concurrent study were enrolled. Three donkeys had unilateral granulomas, 2 donkeys had bilateral granulomas, whereas the remaining 5 were grossly normal. The granulomas were either single or multiple, firm, well-circumscribed, tan to red, and 1 - 5 mm in size. Upon incision, abundant, thick, tan to white-yellow fluid was recovered. Histopathology revealed epithelioid macrophages, multinucleated giant cells, and abundant sperm cell fragments with mineralized cellular debris. Semen was harvested for cryopreservation through retrograde flushing of the cauda epididymis. Sperm concentration and motility parameters (total motility, TM; progressive motility, PM) were assessed with an automated sperm analyzer; plasma membrane integrity (PMI), and mitochondrial membrane potential (HMMP) were assessed with flow cytometry pre- and post-freezing. Postfreezing semen was assessed through flow cytometry for the presence of antisperm antibodies (IgG and IgA). Statistical analysis was performed with the Wilcoxon matched-pairs signed-rank test. Significance was set at $p < 0.05$. The total sperm yield did not differ ($p > 0.05$) between groups (Control 11.0 ± 2.0 , Granuloma $9.0 \pm 0.4 \times 10^9$). TM did not change ($p > 0.05$) after freezing in the Granuloma group (TM prefreezing $29 \pm 6\%$, postfreezing $18 \pm 3\%$). After freezing, PM

and PMI of donkeys with sperm granuloma were lower ($p < 0.05$) than healthy ones (PM Control $15 \pm 2\%$, Granuloma $7 \pm 2\%$; PMI Control $51 \pm 4\%$, Granuloma $36 \pm 5\%$). Pre- and post-freezing HMMP did not differ ($p > 0.05$) among groups. Three of the 5 donkeys with granuloma had a percentage of IgG- and IgA-bound sperm above the maximum value observed in control donkeys. Mean percentage of IgG- and IgA-bound sperm did not differ ($p > 0.05$) among groups (IgG-bound Control $2 \pm 0.4\%$, Granuloma $16 \pm 10\%$; IgA-bound Control $0.1 \pm 0.1\%$, Granuloma $0.5 \pm 0.4\%$). In conclusion, sperm granulomas only marginally affected sperm quality and resulted in IgG and IgA antisperm antibodies binding to sperm. It remains to be determined if sperm granuloma and antisperm antibodies affect fertility in donkeys.

Keywords: Antisperm antibodies, epididymis, blood-epididymis barrier, epididymitis

Laser ablation of the equine oviductal papilla as a novel contraceptive technique

Grace Edwards, Robyn Ellerbrock, Randall Eggleston, Maria Ferrer

College of Veterinary Medicine, University of Georgia, Athens GA

Reproductive control of wild horse populations has frustrated the bureau of land management for years. GnRH and Zona Pellucida vaccines have a limited duration of efficacy, intrauterine devices are unpredictably retained, and attempts to ovariectomize mares were met with public outcry in 2018. The development of a nonsurgical permanent sterilization technique has the potential to revolutionize management of wild horses and burros on public lands. The objectives of this study were to develop a safe and efficient sterilization technique, and to demonstrate technique effectiveness in reproductively healthy mares. We hypothesized that laser ablation of the oviductal papillae would be an effective method of permanent sterilization. Seven light breed reproductively healthy mares (5 - 21 years) were enrolled in the study after pregnancy confirmation at 14 days. Mares were given prostaglandin to induce abortion and within 14 days were sedated with xylazine hydrochloride for hysteroscopy. Examination of the endometrium and oviductal papillae was accomplished using a 103 cm flexible endoscope (Olympus GIF-160 Gastroscope, Center Valley, PA) attached to an Olympus EVIS EXERA CV-160 video processor. The endoscope