Sperm Motility Is Altered in Uterine Secretions from Mares with Postbreeding Endometritis

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Although spermatozoa appear to survive in an inflamed uterine secretion, this environment is detrimental for sperm motility. The harmful effect of inflammation peaked at 12 h after previous insemination and was most accentuated in the presence of polymorphonuclear neutrophils (PMN’s). Breeding mares repeatedly within 24 h may have a detrimental effect on the inseminated semen. Authors’ address: Dept. of Clinical and Population Sciences, College of Veterinary Medicine, 1365 Gortner Ave., University of Minnesota, St Paul, MN 55108. © 1998 AAEP.

1. Introduction

A physiological transient postbreeding inflammation serves to clear the uterus of excess spermatozoa, seminal plasma, and contaminants associated with breeding. In normal mares, the inflammation peaks at 12 h and subsides within 24–36 h after breeding. Therefore, repeated breedings with fresh semen commonly performed every second day should not be affected by the inflammatory environment that results from a previous breeding. However, multiple inseminations within 6–24 h is common practice when mares are bred with cooled or frozen-thawed semen. The objective of this study was to determine if the total or progressive motility of spermatozoa is altered by an inflammatory uterine environment.

2. Materials and Methods

Mares (n = 5) in estrus were inseminated with 1 x 10⁸ spermatozoa from a stallion of known fertility. Uterine secretions were collected by the use of an aseptically inserted tampon prior to insemination and randomly at 6, 12, or 24 h after insemination in subsequent estrous cycles. Each mare was used only once per cycle. A negative endometrial cytology swab was obtained from all mares prior to each experiment. At the time of uterine secretion sampling, semen was collected from two stallions and extended in a milk-based extender to a concentration of 50 x 10⁶/ml. Uterine secretions were analyzed for inflammatory cell content. Extended semen was diluted 2:1 with (1) uterine secretion, (2) uterine secretion following centrifugation, and (3) semen extender (absorbed and recovered from a tampon). Samples were stored at room temperature and analyzed for motility, progressive forward motility, and velocity by using a computerized semen analyzer. Each sample was analyzed every 40 min for a total of 4 h. The semen motion characteristics were compared between samples by using a general linear models procedure for repeated measures analysis of variance in the SAS program. The effect of individual stallions and mares was considered in the model. Statistical significance was set at p < 0.05.
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13.3/ml at 12 h after AI (73% PMN's), and 11.7
ered when repeated AI is performed. Breeding
motion on inseminated spermatozoa should be consid-
PMN phagocytosis. The effect of uterine inflamma-
likely to be eliminated from the reproductive tract by
these spermatozoa are
likely to be the result of the rapid binding of spermatozoa
insemination and was most accentuated in the pres-
ence of PMN's. The marked suppression of progres-
sive motility in the noncentrifuged samples appeared
be the result of the rapid binding of spermatozoa
to PMN's (data not shown). These spermatozoa are
likely to be eliminated from the reproductive tract by
PMN phagocytosis. The effect of uterine inflamma-
tion on inseminated spermatozoa should be consid-
ered when repeated AI is performed. Breeding
mares repeatedly within 24 h may have a detrimen-
tal effect on the inseminated semen.

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