

Endometrial Microbial Isolates Are Associated With Different Ultrasonographic and Endometrial Cytology Findings in Thoroughbred Mares

Modesty D. Burlleson, VMD; Michelle M. LeBlanc, DVM, Diplomate ACT;
W. Tom Riddle, DVM; and Katherine E. M. Hendricks, DVM, PhD

β -hemolytic *Streptococcus* and *Klebsiella* species were more commonly associated with intrauterine fluid and cytological inflammation than isolation of *E. coli* and other gram-negative organisms. Authors' addresses: Rood and Riddle Equine Hospital, PO Box 12070, Lexington, Kentucky 40580-2070 (Burlleson, LeBlanc, and Riddle); and Southwest Florida Research and Education Center, 2685 SR 29 N, Immokalee, Florida 34142 (Hendricks); e-mail: modesty@burllesonfarms.com. © 2010 AAEP.

1. Introduction

This study was performed to determine whether ultrasonographic and cytologic findings differed based on microbial pathogens isolated from the uterus of Thoroughbred mares during estrus.

2. Materials and Methods

Cytologic and ultrasonographic findings from 410 Thoroughbred mares were compared with microorganisms isolated from 670 positive endometrial cultures (culture swab, n = 453; small volume flush, n = 217).

3. Results

β -hemolytic *Streptococcus* (189/670, 28.3%) and *Escherichia (E. coli)* (138/670, 20.5%) were isolated most frequently from uterine samples of mares. Mares with intrauterine fluid were 1.4 times more likely to have >5 neutrophils/field on cytologic specimens than those with no or mild fluid. Intrauterine fluid was more commonly seen when β -hemolytic *Streptococcus* (90/181), *Klebsiella species* (12/22), *Enterobacter cloacae* (6/14), or yeast (4/4) was iso-

lated compared with *E. coli* (50/128), *Staphylococcus aureus* (20/63), *Pseudomonas spp.* (13/45), at least two cultured organisms (39/114), or non-pathogens (4/24). Forty-one percent (273/659) of cytologic specimens paired with a positive culture had >2 neutrophils/field. Mares positive for *E. coli* (57/136), *Staphylococcus aureus* (18/63), and *Pseudomonas spp.* (15/46) or at least two cultured organisms (43/119) had fewer cytology specimens with >2 neutrophils/field than mares positive for β -hemolytic *Streptococcus* (93/185) *Klebsiella species* (13/22), or yeast (5/7). Moderate to heavy debris was highly associated with *E. coli* (89/108), β -hemolytic *Streptococcus* (91/112), at least two cultured organisms (70/83), and yeast (4/4).

4. Discussion

Intrauterine fluid was associated with >5 neutrophils/field on cytology and not with isolation of specific microorganisms. However, intrauterine fluid and a cytology containing >2 neutrophils/field were more common when β -hemolytic *Streptococcus* were isolated than *E. coli*.

Research Abstract

NOTES

Endometrial cytology is often compared with histology and seems to be an efficient method for the diagnosis of endometrial disorders, especially endometrial cancer. We report a case of misdiagnosed endometrial cancer by D&C, but with a positive cytopathological finding. Different endometrial brushes were used in these 9 studies, including the Tao brush (2), Endoflower (2), Endogyn (1), Cytobrush (1), and Uterobrush (1), and 1 study used six different devices. In all, 8 studies prepared the cytology specimens with a liquid-based cytology, and 1 study used the conventional way. Abnormal cervical cytology was associated with high-grade endometrial cancer, worse 5-year median recurrence-free survival and worse disease-specific survival (44). Thoracic endometriosis can be associated with recurrent thoracic endometriosis syndrome at times of a menstrual period that includes catamenial pneumothorax in 73% of women, catamenial hemothorax in 14%, catamenial hemoptysis in 7%, and pulmonary nodules in 6%.[35][36]. Endometriosis is a heritable condition that is influenced by both genetic and environmental factors.[39] Children or siblings of people with endometriosis are at higher risk of developing endometriosis themselves; low progesterone levels may be genetic, and may contribute to a hormone imbalance.[40] There is an approximate six-fold increased incidence in individuals with an affected first-degree relative.[41]. Under normal circumstances, however, microbial contamination of the uterus is a frequent finding in postpartum dairy cows. The natural immune defense mechanisms within the uterus usually eliminate uterine infection by the time cows are inseminated, but in some cows, infection persists. When bacterial infection of the uterus persists beyond 4 weeks postpartum, the uterine infection is referred to as endometritis. Therefore, the reproductive performance of a dairy cow after the voluntary waiting period is associated with her uterine health. Interventions directed at improving reproductive management in dairy herds are most beneficial if they result in early identification of cows at increased risk of failure to become pregnant. Endometrial microbial isolates are associated with different ultrasonographic and endometrial cytology findings in Thoroughbred mares. MD Bureson, MM LeBlanc, WT Riddle, KEM Hendricks. Anim Reprod Sci 121, 103, 2010. 27. 2010. Host specificity testing and examination for plant pathogens reveals that the gall-inducing psyllid *Calophya latiforceps* is safe to release for biological control of *R. Diaz*, V Manrique, JE Munyaneza, VG Sengoda, S Adkins, K Hendricks Endometrial cytology is the most used technique to diagnose SCE in cattle in both field and research setups (Dubuc et al., 2010, de Boer et al., 2014). The assessment of the proportion of PMNs in cytology slides is the hallmark for SCE diagnosis, to the point that some authors refer bovine SCE to as "cytological endometritis" (CYTO) (de Boer et al., 2014) (Figure 3). Similarly to PVD, CYTO diagnostic criteria are established based on subsequent reproductive performances (Dubuc, 2011). Figure 3. Endometrial cytology smears stained with Diff-Quick®, observed by light microscope. A. 100x, B. 400x (arrows point at polymorphonuclear cells). Risk factors associated with CYTO prevalence were different in cows versus nulliparous heifers.