Diagnostic double guarded low-volume uterine lavage in mares


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Endometritis constitutes a major problem in the management of broodmares; hence diagnostic tests with a high sensitivity and specificity are desired. We hypothesize that a double guarded uterine flush technique for bacterial culture and cytology is comparable to standard diagnostic tests, the endometrial biopsy and double guarded swab.

Endometrial biopsies (n=199), swabs (n=199) and double guarded lavage samples (n=199) were obtained from 34 mares at six different time points in four estrous cycles, and were evaluated cytologically and bacteriologically. Endometrial biopsies from the first cycle (n=34) were examined for the presence of polymorphonuclear neutrophils (PMNs) in the endometrial epithelium and was used as a gold standard for calculation of diagnostic sensitivity.

E. coli was most frequently isolated (lavage: 31%, swab: 21%, biopsy: 12%) followed by β-hemolytic streptococci (lavage: 11%, swab: 8%, biopsy: 7%) (positive bacterial growth > 4 colony forming units (CFU)). Positive cytology was less likely to occur when E. coli was isolated from the diagnostic tests compared to the growth of β-hemolytic streptococci. Isolation of pathogens from uterine samples was highly associated with the presence of PMNs on histology (p=0.003). Using the presence of PMNs in the endometrial tissue as the gold standard for diagnosing endometritis, the sensitivity of double guarded lavage culture was 0.75, and 0.33 and 0.5 for the swab and biopsy, respectively.

In conclusion, the double guarded lavage technique was an accurate method for diagnosing mares with endometritis and the risk of false positive samples is considered to be minimal compared to other flushing techniques described.

Keywords: Endometritis, double guarded lavage, diagnostic test, E. coli, β-hemolytic streptococci