Effect of intrauterine infusion of enrofloxacin on endometrial histology in mares

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Studies in vitro show that enrofloxacin is the only antibiotic to which most common endometritis-causing pathogens in mares have no resistance. Enrofloxacin could be a useful in the treatment of endometritis. Studies demonstrating the safety, tolerance, and side-effects of intrauterine infusion of enrofloxacin on the endometrium are scarce. Fumuso, et al. reported that intrauterine infusion of enrofloxacin in mares does not induce histological endometrial changes.\textsuperscript{1} This is not consistent with field observations. The objective of this study was to determine if daily intrauterine infusion of enrofloxacin in mares causes significant acute and chronic endometrial inflammation and fibrosis.

Nine adult healthy mares with no clinical evidence of endometritis were used. Mares received daily intrauterine infusions of enrofloxacin (Baytril\textsuperscript{®} 100, 100 mg/ml, Bayer Animal Health, Shawnee, KS, USA) at 2.5 mg/kg for three days (note: off-label use of drug). Endometrial biopsies were taken prior to (S1) and at the end of treatment (S2) to evaluate acute effects of the antibiotic on endometrium. To evaluate the chronic effects, endometrial biopsies were taken at 14 days (S3) and 60 days post-treatment (S4). Biopsy samples were examined histologically and graded as described by Kenny and Doig (I, Ia, IIb, or III). Changes in endometrial biopsy grade within each mare were used to determine effects of treatment using a one-way ANOVA with correction for repeated measures.

Enrofloxacin induced acute epithelial ulceration, coagulative necrosis and hemorrhage of the stratum spongiosum which was evident in biopsy S2. The deeper endometrium had moderate to large amounts of pleocellular inflammation, edema, and hemorrhage. The S2 biopsies for all mares were categorized as endometrial grade III. In biopsy S3 most mares had evidence of significant fibrosis and inflammation consistent with grade IIb or III. In biopsy S4, fibrosis was extensive with variable inflammation, consistent with grade IIb or III; an overall worsening of endometrial biopsy score by 1 to 3 grades.

The cause of endometrial lesions could be the high pH (10.4) of enrofloxacin and/or biochemical alteration of proteoglycans within vascular endothelium. Enrofloxacin inhibits proliferation of equine tendon cells due to impaired proteoglycan synthesis. In laboratory animals and women, proteoglycans within the endometrial epithelial cells have been shown to contribute to a non-thrombogenic surface on vascular endothelium.

Keywords: Mare, enrofloxacin, intrauterine infusion, uterine biopsy

Reference