

# Endometritis in Horses

*Inflammation of the inner uterus lining (endometrium) can cause subfertility or infertility*

## Overview

Endometritis is failure of the uterus to clear foreign contaminants (i.e., bacteria, spermatozoa) resulting in inflammation of the inner lining of the uterus (endometrium).<sup>1,2</sup> This is an important cause of reduced fertility and infertility in mares, and therefore is a major contributor to economic loss in the industry.

Most cases of endometritis are the result of bacterial infections involving such bacteria as *Streptococcus zooepidemicus*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, and less commonly *Taylorella equigenitalis* (which causes contagious equine metritis or CEM). Yeast and fungi (*Candida* spp. and *Aspergillus* spp., for example) can also infect the uterus.<sup>1</sup>

The normal mare uterus is protected from external contamination by the vulva, vestibule, vagina, and cervix, which function as physical barriers that block the passage of foreign material(s). Injury, anatomic abnormalities, or loss of structural function (e.g., post-foaling) can permit the introduction of microorganisms into the uterus, resulting in endometritis. In severe or persistent cases, a chronic endometritis can develop accompanied by degenerative changes of the endometrium, including fibrosis (scarring). This condition is usually noted in older, multiparous mares (those which have foaled more than twice).<sup>1</sup>

Semen also incites an inflammatory reaction in the uterus post-breeding.<sup>2</sup> Almost all mares develop a transient, post-breeding endometritis regardless of breeding technique (natural or artificial insemination). A persistent mating-induced endometritis (PMIE) develops in some mares, presumably due to impaired uterine clearance mechanisms.<sup>2,3</sup> Approximately 15% of Thoroughbred broodmares develop PMIE.<sup>1,2</sup>

## Clinical Signs

Except mares with CEM, most horses



The most common causes of endometritis in mares are bacterial infections.

with an inflamed endometrium do not produce a visible vaginal discharge. In general, the hallmark of endometritis is reduced fertility. For example, affected mares show early return to estrus after breeding to a fertile stallion or a shortened interestrous interval. That is, they come into heat more frequently than anticipated.<sup>1</sup>

## Diagnosis

Key tools in diagnosing endometritis include microscopic analysis (cytology) of an endometrial swab or endometrial biopsy. Culturing samples obtained from the uterus during estrus (heat) is also useful to identify the particular species of bacteria or other microorganism colonizing the uterus and the sensitivity of these organisms to antimicrobial drugs.

The identification of one or more bacterial species after culturing endometrial samples, however, is not sufficient to diagnose endometritis. A positive diagnosis of endometritis also requires microscopic evidence of an influx of inflammatory cells (i.e., neutrophils are seen in the acute stage). Examination of endometrial biopsies is another technique for evaluating the uterus.

In mares with chronic endometritis a

variety of inflammatory cells with fibrosis (scarring) around the endometrial glands are commonly observed.<sup>1</sup>

Transrectal palpation and ultrasound examinations that identify free fluid in the uterus prior to breeding are highly suggestive that the mare is susceptible to endometritis. Mares with free fluid in the lumen of the uterus more than 24 hours post-breeding are considered positive for a mating-induced endometritis.

Hysteroscopy (directly examining the uterus using an endoscope) provides important information regarding the severity of the inflammation and the presence of foreign bodies, adhesions, masses, and cysts. Each of these abnormalities can adversely affect fertility.

## Treatment

The goal of treatment is to remove the inciting cause and decrease uterine inflammation. Endometritis associated with nonspecific infections necessitates repairing any anatomic defects in the mare's reproductive tract structure (e.g., Caslik's surgery to augment closure of the vulva).

Once the underlying physical concerns have been addressed, the endometrial inflammation often resolves without further treatment. In persistent cases, systemic or local antimicrobial drug therapy via intra-uterine infusion can be implemented.<sup>1</sup>

CEM is more challenging, requiring local treatment with a cleansing solution (e.g., 4% chlorhexidine) and application of an antibiotic ointment such as nitrofurazone along with uterine lavage. Best results are achieved when this process is performed during estrus. CEM is a reportable, foreign animal disease in North America.<sup>4</sup>

In mares with a post-breeding endometritis, uterine lavage with saline (with or without drugs such as oxytocin or prostaglandin F) is recommended to clear the uterus of inflammatory products and fluid. These lavages are safely performed between

six and 24 hours post-breeding.<sup>1</sup>

Immunostimulants are also being used as a treatment for endometritis.<sup>5</sup> Veterinarians urge use of these in conjunction with good mare management.

The only immunostimulant approved by the USDA specifically for the treatment of uterine infections is SETTLE (which contains mycobacterium cell wall fraction immunostimulant, or MCWF). One research study showed mares treated with mycobacterial cell wall formulation (MCW) were cured of endometritis in 55% of the cases after 24 hours and in 75% of cases after seven days.<sup>6, 7, 8</sup>

Another study using MCW (SETTLE) administered the day after foaling promoted a significantly higher pregnancy rate, a dramatic pathogen-dependent decrease in bacterial contamination in the endometrium, and a significant decrease in the number of endometrial inflammatory cells presented at foal heat.<sup>6</sup>

Other therapies being examined, but are not yet routinely used, include systemic administration of dexamethasone and oral cyclooxygenase-2 (COX-2) inhibitors post-mating.<sup>3, 5</sup>

**Prognosis**

Endometrial biopsies allow veterinarians to microscopically determine the degree of inflammation, fibrosis (scarring) around glands, and other abnormal alterations that might affect endometrial function and predict future foaling rates.

The biopsies are assigned a grade ranging from Grade 1 (normal, no significant abnormalities) to Grade 3 (significant loss of endometrial glands such that the mare is unlikely to be able to support a pregnancy to full-term). Predicted foaling rates are 80-90% in mares with Grade 1 biopsies, 50-80% with Grade 2A, 10-50% with Grade 2B, and less than 10% in mares with Grade 3 biopsies.<sup>1</sup> Horses with nonspecific infections and sexually transmitted diseases typically have a good prognosis if treated aggressively.

**Prevention**

Sexually transmitted diseases can be prevented by only breeding horses that are certified free of CEM and harmful bacteria. While endometritis unrelated to sexually transmitted diseases cannot necessarily be prevented, the appropriate use of diagnostic

tests and medical management of mares with endometritis are likely to improve subsequent conception and foaling rates. 🐾

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