EDITORIAL

Diagnosing postpartum endometritis in cattle

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Postpartum endometritis is a common cause of infertility in dairy cattle (Fig 1). Most veterinarians can confidently examine the female reproductive tract to discriminate between a cow with endometritis and a normal cow. However, veterinarians are less confident when asked what defines a case of endometritis, how to diagnose the disease, when after calving to make the diagnosis, and how sure they are that their method of diagnosis is accurate? These challenges are highlighted in a study by Kusaka and co-authors, comparing three methods for diagnosing postpartum endometritis, which is summarized on page XXX of this week’s issue of the Veterinary Record. The key finding was that between two and six weeks after calving there was little agreement amongst the three methods used to diagnose endometritis, but there was good agreement amongst the methods seven weeks after calving, when identifying the mainly normal cows.

Endometritis is an important disease for veterinarians to be able to diagnose because the disease causes infertility in individual cows, and reduces herd fertility. 2-4 Endometritis increases the average interval from calving to first insemination by nearly a week compared with normal cows, delays conception by about four weeks, and nearly doubles culling for failure to conceive. This reduced fertility, even after the
successful treatment of endometritis, is not only a consequence of the inflammation in
the uterus and oviduct during the disease, but also caused by abnormal oestrous
cycles and damaged oocytes.  

The normal postpartum period includes prompt involution of the uterus and
regeneration of damaged endometrium, resumption of ovarian cyclical activity and the
ovulation of competent oocytes, and control of the pathogenic bacteria that are found
ubiquitously in the uterus of postpartum cattle.  These concurrent processes take
about three to four weeks, after which a normal cow usually has uterine horns < 3 cm
diameter and a cervix < 5 cm diameter, with no pus detectable in the reproductive
tract, and regular oestrous cycles. However, in about 15 to 20% of dairy cows there is
pus in the reproductive tract and/or an enlarged cervix, which are signs of clinical
endometritis.  

The definitions of postpartum uterine disease are usually based on those proposed in
2006.  Briefly, clinical endometritis is defined by the presence of pus in the uterus
three weeks or more after calving, usually with a purulent uterine discharge detectable
in the vagina, and/or a cervix > 7.5 cm diameter. The severity of endometritis can be
scored based on the abundance and appearance of pus in the vaginal mucus: score
0 is normal, clear or translucent mucus; score 1 endometritis is mucus containing
flecks of pus, which is usually an white or off-white colour; score 2 endometritis is
mucus containing < 50% pus; and, score 3 endometritis is mucus containing > 50%
pus.  The prognostic value of scoring the severity of endometritis is that animals
with higher scores have lower treatment success rates and, even after successful
treatment, they have lower conception rates. Subclinical endometritis is diagnosed
when the uterine discharge is normal but the proportion of neutrophils in endometrial
cytobrush samples exceed specified thresholds, which depend on the time after calving, as outlined in the present study. ¹

The methods used to diagnose endometritis usually rely on detecting the presence of pus in the reproductive tract by inspection of the contents of the vagina, using a gloved-hand, Metricheck device or vaginoscope, or by using transrectal ultrasonography of the uterus (Fig 2). ⁸; ¹⁰ The study by Kusaka and co-authors compared the diagnosis of endometritis using a Metricheck device, transrectal ultrasonography, and counting the number of neutrophils in endometrial cytobrush samples. Despite each of these methods detecting an aspect of pus in the reproductive tract, there is often disagreement between operators; ¹¹ and, as reported in the present study and by others, there is disagreement between diagnostic methods. ¹; ⁴; ⁹; ¹⁰; ¹² One explanations for this disagreement is probably the subjective nature of the diagnosis and scoring of endometritis. Furthermore, it is often possible to detect neutrophils in cytobrush samples when there is insufficient pus in the uterus for a positive diagnosis by inspecting the contents of the vagina or ultrasonography of the uterus. Similarly, it is sometimes possible to detect pus resulting from vaginitis or cervicitis independently of endometritis. ¹³ Indeed, in the study by Kusaka and co-authors, 43% of cases of endometritis diagnosed by ultrasound three weeks after calving did not have pus in the vagina detectable using the Metricheck device. ¹

Another challenge that the paper in the Veterinary Record helps to address is when to diagnose endometritis. The timing of diagnosis for endometritis has to allow three to four weeks after parturition for recovery of the uterus in normal cows, and yet provide sufficient time for treatment of diseased cows before insemination, which usually starts from seven weeks after parturition. There is also a practical consideration about
integrating the timing of diagnosis into routine fertility visits for dairy farms. The reduction in the proportion of cows with endometritis slowed after three to four weeks after calving in the study by Kusaka,¹ which supports the widely applied clinical practice of examining cows for endometritis about four weeks after parturition. Thus, when visiting farms that have fortnightly routine fertility visits, veterinarians should examine cows for endometritis between three and five weeks after parturition.

Additional conclusions that can be drawn from the study in the Veterinary Record,¹ are to be clear about the definitions of endometritis, and to score the severity of disease - if you can measure it, you can manage it. Furthermore, multiple lines of evidence provide for a more robust diagnosis, and veterinarians should use more than one diagnostic method.¹;⁸;⁹ First, herd records should be used to identify cows at risk of endometritis, such as cows with a history of retained foetal membranes, dystocia or twins. Second, the reproductive tract should be examined for the presence of pus using a hand, Metricheck or vaginoscope. Finally, transrectal ultrasonography should be used to identify pus in the uterus and whether there is an enlarged cervix.

Veterinarians are always going to be faced with the tensions between taking time to make an accurate diagnosis of endometritis and the need for efficient routine fertility visits to dairy herds. What helps is having a strategy to monitor postpartum dairy cows (see Box: What you need to know). Accurately detecting the presence of pus in the reproductive tract is important in postpartum cows, whether that pus may have come from disease or damage to the uterus, cervix or vagina. The future may bring more accurate diagnostics; for example, a cow-side test for neutrophils in the uterus would be handy. However, for now, there remains room for improvement in the veterinary diagnosis of postpartum endometritis in cows.
References


WHAT YOU NEED TO KNOW

- Accurate diagnosis of postpartum endometritis is important to justify treatment with antibiotics or hormones, and because these cows are less fertile than normal cows.
- Be clear about your definitions of endometritis and score the severity of disease.
- Aim to examine cows for endometritis between three and five weeks post partum – long enough for normal cows to recover after calving but soon enough to treat diseased cows before the insemination period.
- Use more than one diagnostic method. Use herd records to identify risk factors for endometritis; examine the genital tract for pus using a hand, Metricheck or vaginoscope; and, use ultrasonography to identify pus in the uterus and/or a cervix > 7.5 cm diameter.
- Be realistic about the accuracy of endometritis diagnosis. Re-examine cows two weeks later when the diagnosis is unclear or when cows are treated for disease.
**FIG 1.** Postpartum endometritis in a dairy cow.

**FIG 2.** Diagnosis of endometritis. Common techniques for detecting the presence of pus in the reproductive tract about 4 weeks after calving include (A) using the Metricheck device to collect mucus from the vagina, and (B) using transrectal ultrasonography of the uterine horns (arrow indicates pus in the uterine lumen).