Femeris Women’s Health Research Center

Clinical Aspects of Endometritis

Endometritis is defined as an infection of the endometrium. It may be called endomyometritis when the infection extends also to the myometrium. Extension of the infection to the parametrial tissues (parametritis) may result in pelvic inflammatory disease (PID). Endometritis is divided into two: obstetric (most commonly post partum endometritis) and non-obstetric. Pathologists classify endometritis as acute or chronic. Acute endometritis is characterized by the presence of neutrophils within the endometrial glands. Chronic endometritis is characterized by the presence of plasma cells or lymphocytes in the endometrial stroma. The incidence of endometritis after a vaginal delivery is 1% to 3% and can be as high as 13% to 50% after a Cesarean section, depending on whether antibiotic prophylaxis was given prior to or during the surgery (1, 2).

Incidence of infection is largely influenced by mode of delivery as well as patient’s characteristics/risk factors. Rate of infection associated with vaginal deliveries is only 1% to 3%. Scheduled Cesarean deliveries completed before the onset of labor has an associated rate of 5% to 15%, whereas the rates associated with unscheduled Cesarean deliveries range from 15% to 20%. Risk factors shown to increase the incidence rate of puerperal endometritis include prolonged rupture of the membranes, prolonged labor, multiple vaginal examinations and internal monitoring during labor, bacterial vaginosis, young maternal age, and low socioeconomic status (1, 3).

Various clinical manifestations of puerperal endometritis include fever, lower abdominal pain, abnormal vaginal discharge/bloeding, abdominal distention, and malaise. Symptoms usually appear within 5 days of delivery. Diagnosis is based on clinical evaluation and exclusion of other sources of infection. Upon physical examination the following signs of infection may be observed: fever, lower abdominal pain, enlargement of the uterus, tachycardia, leukocytosis, and uterine tenderness (1, 3).
Pelvic Inflammatory Disease (PID) is associated with the presence of Neisseria gonorrhoeae, Neisseria gonorrhoeae in one-third to one-half of the cases. The remaining 50% to 70% of cases are associated with other microbes. This study examines the independent association of bacterial pathogens with chronic endometritis in women with endometritis. When 278 women were studied, the frequency of microorganisms from the endometrium of women diagnosed with PID was determined. Of those women studied, 61% of women had growth of facultative or anaerobic bacteria in the endometrium. An increase in diphtheroids, black-pigmented rods, and anaerobic Gram-positive cocci was observed. Of cases studied, 54% were diagnosed with bacterial vaginosis with Gram stain and 90% of cases showed a depletion of H2O-producing Lactobacillus species. These associations remain following exclusion of women with endometrial C. trachomatis and/or N. gonorrhoeae infection. This report suggests that vaginal microorganisms found in women with bacterial vaginosis ascend to the endometrium and cause upper genital tract infections. The authors believe that this is the first study to evaluate a potential relationship between bacterial vaginosis and endometritis. The study's findings support the need for further research in this area.

In a study by Smith and colleagues, aimed at reviewing the clinical data of chronic endometritis cases and assessing samples for specific histopathologic features, various degrees of inflammation were observed. However, the level of inflammation did not appear to impact the symptoms of infection in type, duration, or severity. Another study, by Hagerty, Smith, and Bocklage, cites direct correlations between incidence of chronic cases and age. The highest percentage of cases (41.1%) was seen in women between 41-50 years of age. Increased incidence was observed in perimenopausal women as well. Furthermore, the use of hormones and number of pregnancies was found to be associated with chronic endometritis (6). While many studies have paved the way for our current understanding of endometritis, the etiology, clinical manifestations and treatment options, and additional research will be of great value in further examining the implications of this infection, improving diagnostics, and addressing those questions left unanswered.

**REFERENCES**

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Causes and risk factors

Endometritis usually results from an ascending infection from the cervico-vaginal flora (3). Common pathogens isolated are Chlamydia trachomatis, Peptostreptococcus species, Gardnerella vaginalis, Bacteroides bivius, and Group B Streptococcus. In certain populations it has been associated with tuberculosis. Acute endometritis is commonly caused by an infection with Staphylococcus aureus and Streptococcus species following an instrumental procedure. Postpartum endometritis is frequently a polymicrobial infection involving aerobes and anaerobes that attack the decidua and proliferate. Caesarean section delivery is a major risk factor for endometritis. Other risk factors include prolonged rupture of the membranes, preterm labor, chorioamnionitis, prolonged labor with frequent vaginal exams and low socioeconomic status.

Diagnosis

Patients with endometritis present with fever, lower abdominal or pelvic pain, general malaise, abnormal vaginal bleeding or discharge. In the obstetric patient, a foul-smelling lochia may be present. Patients with PID often complain of dysuria and/or dyspareunia. Physical exam may reveal a distended and tender lower abdomen. Bowel sounds may be decreased. Pelvic exam may reveal vaginal discharge, cervix, uterine, and adnexal tenderness. Laboratory tests include complete blood count although, the finding of leukocytosis is difficult to interpret due to the physiologic leukocytosis of pregnancy (up to 20,000). Wet prep, blood cultures and cervicovaginal DNA sampling for associated pathogens such as Chlamydia trachomatis, Neisseria gonorrhoeae and other organisms, should be obtained. Urinalysis and urine cultures are helpful for differential diagnosis. Endometrial biopsy may aid in the evaluation of a non-obstetric patients with suspected chronic endometritis. The endometrial tissue is sent for microbiologic and histologic studies. The presence of plasma cells is diagnostic for chronic endometritis. The endometrial tissue is sent for microbiologic and histologic studies. The presence of plasma cells is diagnostic for chronic endometritis. Imaging studies are usually reserved for patients that do not respond to antibiotic therapy. Pelvic ultrasound is rarely needed, however, they may be helpful for excluding retained products of conception, pelvic hematoma, or the presence of an unknown foreign body such as a forgotten IUD. Abdominal and pelvic CT scans may be needed to rule out septic pelvic thrombophlebitis in patients not responding to appropriate antibiotic therapy after 48 hours. Laparoscopy is rarely performed unless other conditions such as appendicitis are suspected. Other conditions to be considered in the differential diagnosis are pyelonephritis, urinary tract infection, and viral syndrome.

Treatment

Parenteral antibiotic therapy is the mainstay treatment for endometritis (4). For mild cases of endometritis following a vaginal delivery, oral antibiotics may be an appropriate treatment. The antibiotic regimen should include coverage of Gram-positive and Gram-negative bacteria. A combination of I.V. clindamycin and gentamicin is commonly used. Another popular regimen is the use of a second or third-generation cephalosporin such as cefoxitin or cefotaxim plus doxycycline. For severe cases of acute endometritis, triple antibiotic therapy using ampicillin, gentamicin, and metronidazole provide coverage against most pathogens involved in serious pelvic infections. Endometritis complicated by PID and a tubo-ovarian abscess (TOA) may require surgical intervention if no clinical improvement is present after 48-72 hours of combination I.V. antibiotic therapy. Drainage of a thick wall abscess using laparoscopy or by intervention radiology followed by triple antibiotic therapy, is sometimes needed to treat this possible life threatening infection. A hysterectomy with bilateral salpingo-oophorectomy is rarely performed to treat end-stage PID with pyosalpinx or TOA.

Prognosis

Severe endometritis may result in secondary infertility. Endometrial curettage for retained products of conception or for signs of hemorrage may cause intrauterine synechiae. Endometritis complicated by PID may involve the fallopian tube and lead to salpingitis. Once the fallopian tube becomes damaged; the patient will be at risk for future ectopic pregnancy and infertility. Prophylactic antibiotic therapy during cesarean section (5), early diagnosis of endometritis, and the use of combination antibiotic therapy for treatment will prevent most short and long term complications.

REFERENCES:


Endometriosis

Endometriosis is a condition that occurs when the tissue lining the uterus (endometrium), begins to grow outside of the uterus. It is a leading cause of pelvic pain and one of the major reasons for laparoscopic surgery and hysterectomy in the United States. This condition usually occurs in women of childbearing age and is problematic for this age group due to its association with infertility. While the exact etiology of endometriosis remains unknown, studies have revealed the condition is exacerbated by the hormone estrogen. As women progress through menopause, symptoms begin to abate and will ultimately resolve.

Diagnosis of endometriosis has proven difficult. It has been estimated that over one million women within the United States are affected, with the reported ranges between 3% and 10% of the female population. With this in mind, endometriosis should be suspected when an individual presents with any of the following complaints:

- Pain before and during periods
- Pain during intercourse
- Pain upon urination
- Painful bowel movements
- Gastrointestinal issues, including diarrhea, constipation and nausea
- Problems conceiving

Unfortunately, determining the exact prevalence of this condition has been made more difficult due to the fact that approximately 20% to 40% of affected individuals will have no overt symptoms and, as a result, remain untreated until fertility issues arise. It has been estimated that 20% to 50% of women seeking treatment for fertility issues, and as many as 80% of women with chronic pelvic pain, are actually suffering from endometriosis. Often times there are no cues indicating endometriosis aside from the general pelvic pain and discomfort reported by the patient. In some instances confirmation can be obtained in the form of nodules occurring behind the uterus and along the ligaments that attach it to the pelvic wall upon rectovaginal examination. While these nodules and the presence of pain allude to a case of endometriosis, they are not conclusive. Diagnostic evaluation, often by ultrasound, aids in the confirmation process but, again, is not conclusive. These non-invasive methods are employed to aid in ruling out other pelvic diseases with common symptomologies but, again, are not definitive. Direct visual inspection of the pelvis and abdomen, combined with biopsy of the overgrown tissue are required for accurate diagnoses. Laparoscopic methods have been employed as a means to decrease the invasiveness of this diagnosis. The procedure, typically performed on an outpatient basis, is carried out under general anesthesia. Biopsies are obtained and analyzed for the presence of endometriotic tissue implants as well as for the exclusion of malignancies that could mimetic endometriosis symptomatically.

There is no cure for endometriosis but multiple treatment options exist for the management of pain and to address fertility issues. Factors that are considered when deciding the proper method include consideration of the woman’s needs and expectations, particularly her desire to have children, along with her symptomology and age. Pain management is often addressed with hormone therapy aimed at reducing estrogen levels, which should decrease the size of the endometrial implants and, in turn, decrease pain levels. Often this is achieved by prescribing common birth control hormones or with non-steroidal anti-inflammatories. In instances where a woman wishes to conceive a child, treatment is a little more complicated and is often addressed through infertility treatment, surgery, or a combination of the two. Surgical strategies are aimed at restoring the pelvic anatomy to as close to its normal arrangement as possible. In mild to moderate cases of endometriosis surgery can be performed laparoscopically to keep it minimally invasive while more severe cases require a more extensive and invasive surgery. Hysterectomy is an absolute last resort reserved for women who do not respond to any of the milder forms of treatment or who have very severe symptoms.

Identification of biomarkers specific for endometriosis would not only alleviate the need for surgical evaluation but would also allow for more routine screening of individuals, particularly those women suffering from infertility.

REFERENCES:

Medical Diagnostic Laboratories, L.L.C.

New Tests Announcement

Now available on the OneSwab®

INTESTINAL PATHOGEN DETECTION

MDL is pleased to announce the availability of molecular detection of intestinal pathogens utilizing the OneSwab® specimen collection platform. The OneSwab® platform enables non-invasive specimen collection that provides sufficient sample quantities obtained from loose stool with a rapid turnaround time of only 24 – 48 hours. Testing is now available for ten common intestinal pathogens.

- No refrigeration required before or after collection
- Rapid turnaround time of only 24-48 hours
- Test additions available for up to 30 days
- Specimen viability up to five (5) days

Tests currently available on the OneSwab®

- Campylobacter jejuni by Real-Time PCR
- Clostridium difficile (Toxins A and B) by Real-Time PCR
- Enterococcus faecalis by Real-Time PCR (Reflex to vancomycin-resistant Van A & Van B by Real-Time PCR)
- Enterococcus faecium by Real-Time PCR (Reflex to vancomycin-resistant Van A & Van B by Real-Time PCR)
- Enteroaggregative Escherichia coli (O157:H7) by Real-Time PCR
- Human Rotavirus A by Real-Time PCR
- Listeria monocytogenes by Real-Time PCR
- Norwalk Virus by Real-Time PCR
- Salmonella by Real-Time PCR
- Shigella spp. by Real-Time PCR

Convenient specimen collection with OneSwab®

Loose stool specimen:

Step 1. Utilize the swab provided to obtain a sample of loose stool and insert into the vial.
Step 2. Snap off the shaft to fit completely in the vial.
Step 3. To prevent leakage, be sure the swab fits into the vial prior to capping. Tightly cap the vial and label with patient information.

For results to the electronic Epidemiology Quiz, please visit www.mdlab.com and click on the e-Quiz link.

Q: Recently, I have noticed that my office keeps receiving specimen discrepancy notices to verify the date of specimen collection. Why are we receiving these and how can we prevent them in the future so that it does not affect the turnaround time for our results?

A: The date of specimen collection is a required field and is a very important, often overlooked, piece of information. Not only is this the date of service used to bill out for laboratory testing services, it is also used as an indicator to monitor specimen transport time. Specimens collected via the OneSwab® are stable at room temperature for five days. Some examples of verify date discrepancies may include:

- Dates written on the specimen vial may differ from the date of collection listed on the test requisition form.
- The date provided on the test requisition may be written erroneously by the office staff. We have received dates such as:
  - Patients date of birth
  - A future date
  - Incorrect year

To prevent such discrepancies,

- Be sure that the test requisition form is completed on the same day the specimen is collected.
- Compare the information written on the vial with the information written on the test requisition form to ensure accuracy.
- Double check the date of collection to make sure that dates are not transposed, recorded incorrectly, etc.

If you have a question you would like addressed in future issues, please email your question(s) to QAQ&A@mdlab.com

Recent Publications

MEDICAL DIAGNOSTIC LABORATORIES, L.L.C. (MDL)

Abstracts


Peer-Reviewed Papers


Quality Assurance

eQuiz

Q: 1. True or False: Endometritis and Endometriosis are both associated with an infectious process.  
A: True

Q: 2. What is the incidence of endometritis in unscheduled cesarean deliveries?  
A: a. 1% to 3%  b. 5% to 15%  c. 15% to 20%  d. 20% to 35%

Q: 3. True or False: If left untreated, endometritis may result serious consequences including infertility, ectopic pregnancy, recurrent PID, sepsis, or death.  
A: True

Q: 4. True or False: When treating endometritis, the antibiotic regimen should include coverage of Gram-positive and Gram-negative bacteria.  
A: False

Q: 5. Endometritis can be associated with the following pathogens:  
A: a. Chlamydia trachomatis & Neisseria gonorrhoeae  b. Pseudomonas aeruginosa species & Group B Strep  c. Gardnerella vaginals  d. All of the above  
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Causes and risk factors

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Diagnosis

Patients with endometritis present with fever, lower abdominal or pelvic pain, general malaise, abnormal vaginal bleeding or discharge. In the obstetric patient, a foul-smelling lochia may be present. Patients with PID often complain of dysuria and/or dyspareunia. Physical exam may reveal a distended and tender lower abdomen. Bowel sounds may be decreased. Pelvic exam may reveal vaginal discharge, cervix, uterine, and adnexal tenderness. Laboratory tests include complete blood count although, the finding of leukocytosis is difficult to interpret due to the physiologic leukocytosis of pregnancy (up to 20,000). Wet prep, blood cultures and cervicovaginal DNA sampling are performed. If the wet prep or cervicovaginal flora is highly suggestive, then other non-invasive methods are employed to aid in ruling out other pelvic diseases with common symptomologies not conclusive. These non-invasive methods are employed to aid in ruling out other pelvic diseases with common symptomologies.

Treatment

Parenteral antibiotic therapy is the mainstay treatment for endometritis (4). For mild cases of endometritis following a vaginal delivery, oral antibiotics may be an appropriate treatment. The antibiotic regimen should include coverage of Gram-positive and Gram-negative bacteria. A combination of i.v. clindamycin and gentamicin is commonly used. Another popular regimen is the use of a second or third-generation cephalosporin such as cefoxitin or cefotetan plus doxycycline. For severe cases of acute endometritis, triple antibiotic therapy using ampicillin, gentamicin, and metronidazole provide coverage against most pathogens involved in serious pelvic infections. Endometritis complicated by PID and a tubo-ovarian abscess (TOA) may require surgical intervention if no clinical improvement is present after 48-72 hours of combination i.v. antibiotic therapy. Drainage of a thick wall abscess using laparoscopy or by intervention radiology followed by triple antibiotic therapy, is sometimes needed to treat this possible life threatening infection. A hysterectomy with bilateral salpingo-oophorectomy is rarely performed to treat end-stage PID with pyosalpinx or TOA.

Prognosis

Severe endometritis may result in secondary infertility. Endometrial curettage for retained products of conception or for infertility treatment may cause intrauterine synechiae. Endometritis complicated by PID may involve the fallopian tube and lead to salpingitis. Once the fallopian tube becomes damaged; the patient will be at risk for future ectopic pregnancy and infertility. Prophylactic antibiotic therapy during cesarean section (5), early diagnosis of endometritis, and the use of combination antibiotic therapy for treatment will prevent most short and long term complications.

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Endometriosis

Endometriosis is a condition that occurs when the tissue lining the uterus (endometrium), begins to grow outside of the uterus. It is a leading cause of pelvic pain and one of the major reasons for laparoscopic surgery and hysterectomy in the United States. This condition usually occurs in women of childbearing age and is problematic for this age group due to its association with infertility. While the exact etiology of endometriosis remains unknown, studies have revealed the condition is exacerbated by the hormone estrogen. As women progress through menopause, symptoms begin to abate and will ultimately resolve.

Diagnosis of endometriosis has proven difficult. It has been estimated that over one million women within the United States are affected, with the reported ranges between 3% and 15% of the female population. With this in mind, endometriosis should be suspected when an individual presents with any of the following complaints:

- Pain before and during periods
- Pain during intercourse
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- Painful bowel movements
- Gastrointestinal issues, including diarrhea, constipation and nausea
- Problems conceiving

Unfortunately, determining the exact prevalence of this condition has been made more difficult due to the fact that approximately 20% to 40% of affected individuals will have no overt symptoms and, as a result, remain untreated until fertility issues arise. It has been estimated that 20% to 50% of women seeking treatment for fertility issues, and as many as 80% of women with chronic pelvic pain, are actually suffering from endometriosis. Often times there are no cues indicating endometriosis aside from the general pelvic pain and discomfort reported by the patient. In some instances confirmation can be obtained in the form of nodules occurring behind the uterus and along the ligaments that attach it to the pelvic wall upon rectovaginal examination. While these nodules and the presence of pain allude to a case of endometriosis, they are not conclusive. Diagnostic evaluation, often by ultrasound, aids in the confirmation process but, again, is not conclusive. These non-invasive methods are employed to aid in ruling out other pelvic diseases with common symptomologies but, again, are not definitive. Direct visual inspection of the pelvis and abdomen, combined with biopsy of the overgrown tissue are required for accurate diagnoses. Laparoscopic methods have been employed as a means to decrease the invasiveness of this diagnosis. The procedure, typically performed on an outpatient basis, is carried out under general anesthesia. Biopsies are obtained and analyzed for the presence of endometriotic tissue implants as well as for the exclusion of malignancies that could mimic endometriosis symptomatically.

There is no cure for endometriosis but multiple treatment options exist for the management of pain and to address fertility issues. Factors that are considered when deciding the proper method include consideration of the woman’s needs and expectations, particularly her desire to have children, along with her symptoms and age. Pain management is often addressed with hormone therapy aimed at reducing estrogen levels, which should decrease the size of the endometrial implants and, in turn, decrease pain levels. Often this is achieved by prescribing common birth control hormones or with non-steroidal anti-inflammatory agents. In instances where a woman wishes to conceive a child, treatment is a little more complicated and is often addressed through infertility treatment, surgery, or a combination of the two. Surgical strategies are aimed at restoring the pelvic anatomy to as close to its normal arrangement as possible. In mild to moderate cases of endometriosis surgery can be performed laparoscopically to keep it minimally invasive, while more severe cases require a more extensive and invasive surgical intervention. Hysterectomy is an absolute last resort reserved for women who do not respond to any of the milder forms of treatment or who have very severe symptoms.

Identification of biomarkers specific for endometriosis would not only alleviate the need for surgical evaluation but would also allow for more routine screening of individuals, particularly those women suffering from infertility.

REFERENCES:

Pelvic Inflammatory Disease (PID) is associated with the presence of Neisseria gonorrhoeae, Chlamydia trachomatis, and Mycoplasma genitalium. In a case-control study of 211 women with endometritis, 200 of them (94.8%) were positive for M. genitalium. Further, within the same population, the overall prevalence of M. genitalium was 94.8%. This association between endometritis and M. genitalium infection is widely recognized as a cause of urethritis in addition to being associated with cervicitis, endometritis, and pelvic infection.

However, due to low rates of infection and effective treatment with antibiotics, screening the general population for M. genitalium is not necessary. Whether asymptomatic patients should be tested routinely remains to be determined. In this regard, the increased prevalence of M. genitalium infection in asymptomatic males and females attending a sexual health clinic in the United Kingdom is notable.

Patients of interest were identified using a paper-based questionnaire and subsequent confirmation was obtained through a sensitive test. A number of causes have been identified including past clinical or surgical intervention, endometrial trauma, and difficult to diagnose. Common symptoms associated with CE are a) spotting b) mild and undefined pelvic pain c) leukorrhea and d) vaginal bleeding in most patients. Since pelvic examination and transvaginal sonography do not help in diagnosis of CE, the authors rely on the technique of “fluid hysteroscopy” to characterize the presence of CE. This technique is performed by introducing a small parasitic bacteria, was first isolated in 1980 from urethral specimens of male patients in the United States.

Over the same time period, within the same population, the observed 53% decrease in postpartum endometritis in the group that received prophylactic antibiotics, particularly clindamycin in combination with gentamicin, have also been used to treat puerperal endometritis. One of the arguments is that administration of antibiotics is typically observed within 48-72 hours. While treatment at the onset of infection remains effective, recent studies have examined the benefits of preoperative, prophylactic antibiotic administration. The observed 53% decrease in postpartum endometritis in the context of the use of prophylactic antibiotics, provides strong support for the implementation of such practices.

Acute Endometritis vs. Chronic Endometritis

Acute endometritis is characterized by inflammation associated with the presence of microabscesses or neutrophils within the endometrial glands. Often this form of infection is preceded by PID caused by an invasive gynecologic procedure or sexually transmitted disease such as gonorrhea or chlamydia. In recent years, studies examining the etiology of endometritis have identified an association between bacterial vaginosis (BV) and anorectal bacteria. In 2004, Haggerty and colleagues examined the correlation of N. gonorrhoeae, C. trachomatis, bacterial vaginosis-associated organisms, and Lactobacillus and Lactobacillus with BV, among 276 infected patients using cultures and histological methods. More than 50% of patients with endometritis were classified as having bacterial vaginosis and determined by a vaginal Gram stain. This form of endometritis was also associated with diphtheroids, black-pigmented Gram-negative rods, and anaerobic Gram-positive cocci. Furthermore, a negative association was identified between endometritis and the presence of hydrogen-peroxide producing Lactobacillus, which prevents infection in type, duration, or severity.

In this regard, the increased prevalence of M. genitalium infection in asymptomatic males and females attending a sexual health clinic in the United Kingdom is noteworthy. A number of causes have been identified including past clinical or surgical intervention, endometrial trauma, and difficult to diagnose. Common symptoms associated with CE are a) spotting b) mild and undefined pelvic pain c) leukorrhea and d) vaginal bleeding in most patients. Since pelvic examination and transvaginal sonography do not help in diagnosis of CE, the authors rely on the technique of “fluid hysteroscopy” to characterize the presence of CE. This technique is performed by introducing a small parasitic bacteria, was first isolated in 1980 from urethral specimens of male patients in the United States.

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Puerperal Endometritis

Puerperal endometritis occurs after childbirth and is the most common complication of delivery. Infections tend to be polymicrobial and typically result from the ascension of normal flora bacteria from the vaginal or GI tract. The most common pathogenic organisms associated with postpartum endometritis include Gram-positive cocci such as Group B streptococci and Staphylococcus epidermidis, Gram-negative bacteria such as Escherichia coli, Klebsiella pneumoniae, and Proteus mirabilis, and finally, anaerobes such as Peptostreptococcus species (1, 2, 3). Endometritis is defined as an inflammation of the endometrium. It may be called endometritis when the infection extends also to the myometrium. Extension of the infection to the parametrial tissues (parametritis) may result in pelvic inflammatory disease (PID). Endometritis is divided into two: obstetric (most commonly post partum endometritis) and non-obstetric. Pathologists classify endometritis as acute or chronic. Acute endometritis is characterized by the presence of neutrophils within the endometrial glands. Chronic endometritis is characterized by the presence of plasma cells or lymphocytes in the endometrial stroma. The incidence of endometritis after a vaginal delivery is 1% to 3% and can be as high as 13% to 50% after a Caesarean section, depending on whether antibiotic prophylaxis was given prior to or during the surgery (1, 2).

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