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Застосовний директор кабінету обстetricії та гінекології №1
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МЕТОДИЧНІ ПОВНИЦІ

 для самостійної роботи студентів для підготовки до практичного заняття

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Полтава – 2020
POSTPARTUM SEPTIC DISEASES

**Definition.** Puerperal pyrexia is a fever 38°C or more (determined orally) on 2 individual times at 24 hours apart within first 10 days after delivery. **Postpartum septic diseases** are directly related to pregnancy and labor, have developed in the period from 2-3 days after delivery up to the end of the 6th week and are caused by bacterial and viral infection.

**Classification of the postpartum septic diseases**

**I. Puerperal septic diseases occurred with penetration of bacteria through a labor wound surface:**

- Puerperal endometritis
- Puerperal metroendometritis
- Pelvic cellulitis
- Infection of cesarean section wound

**II. Extragenital puerperal infections:**

- Puerperal mastitis
- Puerperal cystitis
- Puerperal pyelonephritis
- Septic pelvic thrombophlebitis

**III. Intercurrent infectious diseases:**

- Pulmonary infection
- Atelectasis pneumonia
- Influenza virus infection

**IV. General septic diseases.**

- Systemic inflammatory response syndrome (SIRS)
- Sepsis
- Severe sepsis
- Septic shock
**Etiology**

Puerperal infectious diseases are caused by opportunistic pathogenic microbes that that are commonly spread by sex.

**Vaginal normal flora** in late pregnancy consists of the following organisms: Lactobacillus not less than 70%, Candida albicans 20 -25%, Staphylococcus albus or aureus, Streptococcus—anaerobic common E. coli Bacteroides group. *In uncomplicated labor in aseptic conditions, the above microorganisms do not cause an inflammatory response*

**Pathogenic microbes responsible for puerperal pyrexia:** *Aerobic* - Streptococcus hemolyticus Group A. Streptococcus hemolyticus Group B. Staphylococcus pyogenes, aureus, Klebsiella, Pseudomonas, Proteus, Chlamydia trachomatis. *Anaerobic* - Streptococcus, Peptococcus, Bacteroides and Clostridia. There are also associations with 2-3-microbes, which can enhance each other’s properties. Most often the biotope of the birth canal is inhabited by a mixed flora (aerobes and anaerobes in equal measure).

**Factors of risk postpartum septic diseases**

**Antepartum factors:**
- Anemia,
- Preterm labor
- Premature rupture of the membranes,
- Prolonged rupture of membrane > 18 hours.

**Intrapartum factors:**
- Frequent vaginal examinations
- Chorioamnionitis
- Injury of soft tissues in labor
- Obstetric surgery
- Obstetric bleeding
- Delayed parts of the placenta in the uterus
- Complete placenta previa
**Pathogenesis**

The lacerations on the birth canal are often infected by the organisms due to the presence of blood clots or dead space. The wounds become red, swollen and there is associated seropurulent discharge. There may be disruption of the wound if repaired before control of infection.

The course of the inflammatory process depends on the virulence and reactivity of the microorganism. The reaction of the body to infection occurs at the local and systemic level:

- activation of neutrophils and monocytes;
- the release of mediators of inflammation;
- diffuse vasodilation and increased permeability of the endothelium;
- activation of the blood clotting factors.

**Ways of spreading the infection**

The placental area of the endometrium, the wound surface of the cervix, vagina and perineum are the site of primary infection. The growth of pathogenic microorganisms is facilitated by the separation from the wound, blood clots, surgical interventions. Local postpartum infection (endometritis) becomes widespread (metritis or parametritis).

Pelvic cellulitis (parametritis) is an inflammation of the pelvic fat that is caused by the spread of infection by intracanital or lymphatic or hematogenous pathways. Infiltration with subsequent exudation of the pelvic fat is usually one-sided. The uterus is displaced in the opposite direction (see fig. ).

![Ways of spreading the puerpal infection](image)
Obstetric peritonitis develops mainly after cesarean section and is caused by necrosis of the postoperative wound or intestinal stasis.

Pelvic abscess after pelvic peritonitis can be caused by the spread of infection directly through drainage tubes or lymphatic vessels.

Septic thrombophlebitis of the pelvis can affect the veins of the ovaries, uterus and pelvis, rarely the lower vena cava. Infected thrombus is inflated and destroyed. Then thromboembolism blocks microcirculation of vital organs.

Sepsis leads to an abscess of the lung, meningitis, pericarditis, or multiple organ failure. Mortality is about 30%.

**The diagnosis of puerperal septic disease**

The principles in investigations are:

- to determine the source of infection
- to identify the microorganisms
- to establish the severity of disease

*It is always necessary to exclude extragenital infection!*

**Anamnesis:** analysis of peritoneal risk factors (prolonged rupture of membranes or prolonged labor, anemia, gestational pyelonephritis)

**Bacteriological examination** of the separated cervical canal, vagina, urine, milk and blood for identification of pathogenic microflora with sensitivity to antibiotics

**Blood-test** for total and differential white cell count, hemoglobin, platelet count, blood urea and electrolytes. Thick blood film should be examined for malarial parasites.

**Pelvic ultrasound** is helpful to detect retained bits of conception within the uterus, to locate abscess, pus or fluid with the pelvis, color flow-doppler study to detect venous thrombosis (see fig.)
CT and MRI are needed specially when diagnosis is in doubt or there is pelvic vein thrombosis.

X-ray chest – for exclude pulmonary or any lung pathology

**Treatment**

**General medicine care:**

- Isolation of the patient
- Adequate fluid and calorie is maintained by intravenous infusion
- Anemia is corrected
- A permanent bladder catheter is needed to take into account diuresis
- Constant control pulse, respiration, temperature, lochial discharge and diuresis.

**Antibiotic therapy** : Gentamicin (2 mg/kg every 8 hours) and Ampicillin (1 g every 6 hours) or Clindamycin (900 mg every 8 hours) should be started. Intravenous administration of Ceftriaxon: 1 g every 6–12 hrs or Cefotaxime 1-2 g, 8 hourly is another alternative, Ciprofloxacin: 400 mg intravenous every 12 hrs, Levofloxacin: 500 mg intravenous every 24 hrs. Metronidazol: loading dose: intravenously over 1 hr (1 g per 70 kg); supporting dose within 6 hours: intravenous infusion over 1 hr every 6–8 hrs (500 mg per 70 kg), starting from the loading dose, not more than 4 g
within 24 hrs, Vancomycin: 1 g or 15 mg/kg intravenous every 12 hrs, Imipenem + cilastatin: 500 mg intravenous every 6 hrs, Ticarcilin + clavulanate: 3–5 g intravenous every 4–6 hrs. The treatment is continued until the infection is controlled for at least 7–10 days.

**Surgical treatment:** There is little role of major surgery in the treatment of puerperal sepsis.

**Perineal wound.** The stitches of the perineal wound may have to be removed to facilitate drainage of pus and relieve pain. The wound is to be cleaned with sitz bath several times a day and is dressed with an antiseptic ointment or powder. After the infection is controlled, secondary suture may be given at a later date.

Retained uterine products with a diameter of 3 cm or less may be disregarded and left alone. Otherwise surgical evacuation after antibiotic coverage for 24 hours should be done to avoid the risk of septicemia. Cases with septic pelvic thrombophlebitis are treated with heparin for 7–10 days.

**Pelvic abscess** should be drained by colpotomy under ultrasound guidance.

**Abscess pointing** above the Poupart’s ligament should be incised and the pus is drained.

**Wound dehiscence:** Dehiscence of episiotomy or abdominal wound following cesarean section is managed by scrubbing the wound twice daily, debridement of all necrotic tissue and then closing the wound with secondary suture. Appropriate antimicrobials are used following culture and sensitivity.

**Necrotising fascitis** is rare but fatal complication of wound infection (abdominal, perineal, vaginal) involving muscle and fascia. Risk factors are diabetes, obesity and hypertension. Infection is caused by Gr. A hemolytic streptococcus and often it is polymicrobial. Tissue necrosis is the significant pathology. Treatment includes: wound scrubbing, debridement of all necrotic tissues, and use of effective antimicrobial agents. Management of bacteremic or septic shock includes: Fluid and electrolyte balance (to monitor CVP), Respiratory supports (to maintain arterial PO2 and PCO2), Circulatory support (dopamine or dobutamine)

**Laparotomy has got limited indications.** Maintenance of electrolyte balance by intravenous fluids along with appropriate antibiotic therapy usually control the
peritonitis. However in unresponsive peritonitis, laparotomy is indicated. Even if no palpable pathology is found, drainage of pus may be effective. Hysterectomy is indicated in cases with rupture or perforation, having multiple abscesses, gangrenous uterus or gas gangrene infection. Ruptured tubo-ovarian abscess should be removed.

**Prevention**

**Antenatal** prophylaxis includes:
- increase in the level of Hb of the pregnant woman
- eradication of any septic focus in the body.

**Intranatal** prophylaxis includes:
- restrict vaginal examination during labor
- full surgical asepsis during delivery
- screening for group B streptococcus in a high risk patient.
- prophylactic use of antibiotic at the time of cesarean section : Ceftriaxone 1 g immediately after cord clamping and a second dose after 8 hours is recommended.

**Postpartum** prophylaxis includes:
- aseptic precautions for at least one week following delivery.
- many visitors are restricted.
- infected babies and mothers should be in isolated room.

**Subinvolution of uterus**

**Definition. Subinvolution** of uterus is the involution, which is impaired or retarded. As it is the most accessible organ to be measured per abdomen, the uterine involution is considered clinically as an index to assess subinvolution (see fig.).
Predisposing factors:

- multiple pregnancy
- hydramnios,
- cesarean section,
- prolapse of the uterus,
- uterine fibroid.
- retained products of conception,
- uterine sepsis (endometritis).

Clinical picture:

- abnormal lochial discharge excessive or prolonged,
- irregular or at times excessive uterine bleeding,
- irregular cramp like pain in cases of retained products or rise of temperature in sepsis,
- the uterine height is greater than the normal for the particular day of puerperium.

Management:

The size of the uterus can be ignored, if there aren’t excessive lochia, duplicate bleeding, remains of the fetal egg in the uterus cavity, clinic of uterine sepsis.

Appropriate therapy is to be instituted only when subinvolution is found to be a mere
sign of some local pathology: antibiotics in endometritis, exploration of the uterus in retained products, pessary in prolapse or retroversion.

**Puerperal endometritis (uterine sepsis)**

Puerperal endometritis refers to infection or inflammation of the endometrium, the inner lining of the uterus. The incidence of endomyometritis varies from 1–3% following vaginal delivery and about 10% following cesarean delivery. The decidua specially over the placental site is primarily affected.

**The risk factors for endometritis are:**

- retained products of conception,
- cesarean section,
- chorioamnionitis,
- prolonged rupture of membranes,
- preterm labor
- repeated vaginal examinations in labor.

The necrosed decidua sloughs off. The discharge is offensive. A zone of leucocytic barrier prevents the infection to the deeper myometrium. Severe infection is rare nowadays (see fig. ).

Fig. Puerperal endometritis
Clinical picture. The signs of endometritis occur on day 3-5 postpartum (sometimes on day 10), followed by fever and symptoms of intoxications: malaise, headache, muscle pain, chills, sweating. The body temperature is more commonly hyperthermic (higher than 39°C), tachycardia up to 100 beats/min is revealed. Lochiostasis can occur or discharge is profuse and malodorous, with or without blood. Lower abdominal pain is typical.

The bimanual examination shows:
- the cervix is not formed,
- the cervical canal is opened,
- the uterus is painful, soft and does not correspond to the day of the postpartum period.

The complete blood count shows leukocytosis with left shift leukogram, increased ESR, suspected anemia. Bacterial cultures test of the vaginal discharge, urine, milk and blood is mandatory.

Treatment

Systemic Targeted antibiotic therapy, infusion, detoxification therapy and local treatment is required. If the fever lasts for 48-72 hours after treatment start, the resistance of the pathogen to the applicable antibiotics is suspected. Treatment with intravenous antibiotics should last for 48 hours after the disappearance of hyperthermia and other symptoms. Oral antibiotics should be continued for the next 5 days. During antibiotic therapy breastfeeding should be ceased. Ringer solution, 5% glucose solution, 0,9% NaCl solution is used for detoxification. If the disease is accompanied by viral infection, antiviral medications are prescribed.

Local treatment of endometritis includes aspiration-washing drainage of the uterine cavity. Intrauterine infusions of 0,02% chlorhexidine solution, chilled to +4°C, 0,9% sodium chloride isotonic solution are administered with the rate of 10 mL/min.

Contraindications for aspiration-washing drainage of the uterus are:
- the inability of the uterine sutures after cesarean section,
- spread of infection outside the uterus,
- the first postpartum days (up to day 3-4).
In case of failed washing out drainage of the uterine pathological inclusions (blood clots, the remnants of the fetal membranes), vacuum aspiration or careful curettage should be used along with antibiotic therapy and normal body temperature. In the absence of proper conditions curettage is performed only for vital indications (bleeding in the presence of remnants of the placenta).

**The surgical treatment** is applied in case of ineffective conservative therapy and in the presence of negative dynamics in the first 24-48 hours of treatment, the development of a systemic inflammatory response syndrome. Surgical treatment includes laparotomy and hysterectomy combined with the removal of fallopian tubes.

### Puerperal metroendometritis.

Metroendometritis is combined infectious inflammation of the internal mucous (endometrium) and muscle (myometrium) layers of the uterus. Clinical manifestations are similar to endometritis ones, but are more pronounced: fever, rapid pulse, chills, malaise, weakness and headache. Lochiometra is more common to occur.

**Treatment** is similar to endometritis one with the infusion therapy corresponding to the state of severity of the patient.

### Puerperal parametritis.

Parametritis occurs when infection spreads from the uterus through the lymph, affecting the parametrium. The onset of the disease starts within 5-10 days after delivery. The symptoms of the inflammation are fever, marked chills, headache, rapid pulse 120 beats/min, lower abdomen pain, irradiating into lower back and lower extremities.

**In vaginal examination** of the uterus and cervix (see endometritis) sharply painful infiltrates are palpable from the both sides of the uterus. Softening can be detected in suppuration of the infiltrate.

Treatment of the disease includes common antibacterial and infusion therapy. Ice packs are applied on the lower abdomen. In case of suppuration of infiltrate drainage is performed.
Puerperal pelvioperitonitis

(inflammation of pelvic peritoneum, fig.).

The onset of the disease is acute, accompanied by remittent fever, tachycardia and weak pulse; pain in the lower abdomen, often irradiating into the rectum, the lower extremity; distended abdomen, nausea, vomiting, fatigue, positive Schotkin-Blumberg’s symptom. The complete blood count shows leukocytosis with drastic left shift leukogram, increased ESR.

In pelvioperitonitis the upper boundary of the generated inflammatory conglomerate usually passes higher the belly and is formed by the intestinal loops, which are soldered with each other. It can be defined relatively easy by the superficial palpation. Tympanic resonance is detected. In percussion the exudates itself is detected lower in the form of dull sound. The upper boundary of dullness (percussion border) does not match with the upper boundary, detected on palpation (palpatory boundary). The discrepancy between the palpatory and percussion borders is one of the typical diagnostic signs of pelvioperitonitis.
The threatened burst into the rectum or bladder is characterized by the corresponding specific symptoms. 1-2 days prior the burst into the rectum diarrhea with mucus, tenesmus is typical. In the threatened burst into urinary bladder dysuric events occur.

*In vaginal examination* the uterus and uterine adnexa are not clearly palpable due to painfulness and muscle tension.

**Treatment** comprises the combination of three antibiotics and massive detoxification therapy. In conglomeration of purulent exudates the puncture or posterior colpotomy and drainage of the lower part of the peritoneal cavity is performed in the uterorectal space.

For drainage thin rubber tubes are used, through which the outflow of purulent passes and antibiotics are administered. With the progression of the inflammatory process laparotomy and hysterectomy is performed.

**Puerperal peritonitis**

The severe purulent inflammation of the peritoneum, caused by the spread of infection from the uterus. Peritonitis occurs more often when the infection spread on the peritoneum in the inability of the sutures on the uterus after cesarean section or burst of pustules of the fallopian tubes and ovaries. Noteworthy, the highest degree of risk for peritonitis development is after cesarean section. The onset of the disease starts early, sometimes within 2-3 days after delivery (cesarean section). The symptoms are fever, rapid pulse, pain in the abdomen, nausea, vomiting, stool and gas retention. Facial expression of the patient is sardonic. Tongue and lips are dry, covered with fur, distended painful abdomen, anteroventral muscles are tense, positive Schotkin-Blumberg’s symptom.

At the beginning peristalsis of the intestine is slowed down and then completely stops. Alterations of the cardiovascular system occur. Pulse is 100 beats/min and more, weak, can be arrhythmic. Decreased blood pressure. Breathing is hurried and shallow. Abdomen respiration is limited.

Serous, serofibrinous, putulent and hemorrhagic exudate can be found in the abdominal cavity.
Subinvolution of the uterus is noted, absence of its contours on palpation and tenderness along the ribs. Lochia are bloody or muddy.

Vaginal examination shows effusion into the uterorectal pouch (protuberance, overhang of the posterior vaginal vault).

The complete blood count shows significant leukocytosis, eosino-lympho-monocytopenia. Blood culture is almost sterile.

**Treatment of peritonitis includes:**

- antibacterial therapy,
- detoxication therapy,
- medications that eliminate enteroparesis,
- elimination of hypoproteinemia.

In the failed conservative therapy operative treatment is indicated. The purpose of the surgery in the obstetric peritonitis is to remove the source of the infection, i.e., the infected uterus and drainage of the abdominal cavity. The uterus must be removed together with fallopian tubes. Oophorectomy is justified only in the presence of pyo-ovarium or tubo-ovarian purulent abscess.

**Puerperal thrombophlebitis**

**Definition.** Puerperal thrombophlebitis is inflammation of the wall of the vein with the subsequent formation of a blood clot in this area that is fully or partially closes the lumen of the vessel. Sometimes thrombophlebitis is preceded with aseptic thrombosis. Depending on localization the puerperal is divided into uterine veins thrombophlebitis, pelvic veins thrombophlebitis and thrombophlebitis of the deep veins of the lower extremities.

**Investigations:**

- doppler ultrasound and venous ultrasonography
- venography.
- magnetic resonance imaging

**Metrothrombophlebitis** is a complication of metroendometritis. Local thrombophlebitis of the uterine veins is difficult to diagnose. The overall state of patient’s health is usually satisfactory. Body temperature is within 37-38,5°C, rapid
pulse and does not correspond to the temperature. Sometimes single-time chills occur. The complete blood count shows minor leukocytosis, moderate left shift leukogram, relatively insignificant increase in ESR. Subinvolution of the uterus is marked, prolonged and bloody uterine discharge.

**Bimanual examination** shows that the surface of the uterus resembles facet on palpation. If the process extends to the pelvic veins, then the enlarged uterus and painful flexuous fibrotic folds (inflamed veins) are palpated. Metrothrombophlebitis develops in the first 6-13 days postpartum period, and thrombophlebitis of pelvic deep veins develops not earlier than 2 weeks postpartum. The signs of pelvic veins thrombophlebitis are fever, chills, rapid pulse, sometimes pain in the area of the uterus, vomiting (due to irritation of the peritoneum). On palpation veins are first as flexuous dense cords (“earthworms”), and then as painful infiltrates.

**Thrombophlebitis of the deep veins of the lower extremities** develops within the 2-3 weeks postpartum. The symptoms are severe pain in the lower extremities, chills, fever. After 1-2 days swelling and coldness of the extremity is noted. The first symptom of the femoral vein thrombophlebitis is the effacement of the inguinal fold, soreness in the area of the femoral triangle, and thickened vessels are palpated in its depth (see fig).

![Fig. Puerperal thrombophlebitis](image)
**Progressing thrombophlebitis** is characterized by the fact that pathological process spreads into the vein simultaneously with the inflammation of the vascular wall and the formation of blood clot. Blood clots sometimes disintegrate and entered to the lungs with blood flow, causing the pulmonary embolism. Pulmonary embolism manifests by the sharp chest pain, decreased blood pressure, and tachycardia. The most permanent sign of the pulmonary embolism is a stabbing pain during breathing. The body temperature increases; leukocytosis occurs.

**Management:**

- The patient is put to bed rest with the foot end raised above the heart level.
- Pain on the affected area may be relieved with analgesics.
- Appropriate antibiotics are to be administered.
- Anticoagulants (Heparin 15,000 units are administered intravenously followed by 10,000 units, 4–6 hourly for four to six injections when the blood coagulation is likely to be depressed to the therapeutic level. Heparin is continued for at least 7–10 days or even longer if thrombosis is severe)
- The anticoagulant therapy should be continued till all evidences of the disease have disappeared which generally take 3–6 months. The anticoagulant should not prevent the mother from breast-feeding).
- As soon as the pain subsides, gentle movement is allowed on bed by the end of first week. High quality elastic stockings are fitted on the affected leg before mobilization.
- Vena cava fillers are used for patients with recurrent pulmonary embolism or where anticoagulant therapy is contraindicated. Vena cava may be completely ligated by teflon clips.
- Fibrinolytic agents like streptokinase produce rapid resolution of pulmonary emboli.
- Venous thrombectomy is needed for massive illiofemoral vein thrombosis or for massive pulmonary embolus.

**Prevention.**
• Prevention of trauma, sepsis, anemia in pregnancy and labour. Dehydration during delivery should be avoided.
• Use of elastic compression stocking and intermittent pneumatic compression devices during surgery.
• Leg exercises, early ambulation are encouraged following operative delivery.

**Puerperal mastitis**

Puerperal mastitis is the inflammation of the breast (mainly unilateral) during lactation in postpartum period. It often develops within 2-3 weeks after delivery.

Generally, infection spreads through the cracked nipples, intracanalicular penetration of the infectious agent through the milk ducts during the breastfeeding or expression of breast milk; rarely, the pathogen spreads from the endogenous foci.

Risk factors:
- cracked nipples;
- milk stasis.

Cracked nipples can occur in the nipples malformation, late breastfeeding, the incorrect technique of breastfeeding, crude expression of breast milk, individual state of nipples’ epithelium, violation of sanitary-and-epidemiologic norms of the postnatal period. In milk stasis the body temperature can be increased over 24 hours; if it continues more than 24 hours, then this condition is to be treated as mastitis.

**Classification.**

According to the clinical picture of the inflammatory process mastitis can be classified as:
- serous;
- infiltrative;
- suppurative;
- purulo-infiltrative, diffused, nodular;
- purulent (intramammary): areola furunculosis, areola abscess, intramammary abscess, retromammary abscess;
- phlegmonous, purulo-necrotic;
- gangrenous.

According to the localization of the focus mastitis can be:
• subcutaneous,
• subareolar,
• intramammary,
• retromammary
• total.

The clinical picture of mastitis is characterized by the acute onset, marked intoxication (fatigue, headache), and fever of 38-39°C, shivering, pain in the breast, aggravated during breastfeeding or expression of breast milk. The mammary gland enlarges, hyperemia and infiltration of tissues without clear boundaries is noted. Such manifestations are specific to serous mastitis(fig. 59)

![Symptoms of Mastitis](image)

Fig. Puerperal mastitis

In the ineffective treatment a serous mastitis transforms into infiltrative ones within 1-3 days. The firm, sharply painful infiltration, lymphadenitis is determined on palpation. This stage lasts for 5-8 days. If the infiltrate fails to resolve along the treatment, it becomes purulent, leading to purulent (intramammary) mastitis. Aggravation of the local symptoms of inflammation, a significant increase and deformation of the breast is noted; fluctuation is detectable if the infiltrate is subcutaneous. Suppuration of the infiltrate develops within 48-72 hours. In those cases, when several infiltrates become purulent in the breast, mastitis is called phlegmonous. It is manifested by the fever to 39-40°C, marked weakness, and intoxication. The mammary gland is dramatically enlarged, painful, lumpy,
superficial venous network is well expressed, infiltration occupies almost the entire gland, and the skin over the affected area is swollen, shiny, cyanotic red, often with lymphangitis. In phlegmonous mastitis generalization of infection with the transition into sepsis is possible.

**The diagnosis:**
- **clinical:** breast checkup, evaluation of the clinical signs, complaints, history;
- **laboratory:** complete blood count (leukogram), urinalysis, bacteriological and bacterioscopic analysis of the exudate, immunogram, blood coagulogram and biochemical analysis;
- **instrumental:** ultrasonography is one of the essential method of mastitis diagnosis.

**Treatment** of the puerperal mastitis can be conservative or surgical.

It is reasonable to start antibiotic therapy from the onset of the first signs of the disease, which helps to prevent the development of purulent inflammation. In serous mastitis the decision on follow up breastfeeding is made individually. The following should be considered: the opinion of the puerpera, history (for example, suppurative mastitis in the history, numerous scars on the breast, the breasts’ prosthesis), previous antibiotic therapy, records of the bacteriological and bacterioscopic analysis of the exudate, the presence and prominence of cracked nipples. Starting from the stage of infiltrative mastitis breastfeeding is contraindicated due to the real threat of infection of the child and cumulative accumulation of antibiotics in the body of the child, but, at the same time, the lactation can be preserved by expression of breast milk. In the failed conservative therapy of mastitis over 2-3 days and the development of signs of purulent mastitis surgical treatment is indicated.

Surgical treatment consists in radical incision and adequate draining, along with continued antibiotic therapy, disintoxicative and desensitizing therapy. Timely surgical treatment allows preventing the progression of the process, the development of the systemic inflammatory response.
**TESTS**

1. On the 5th day after labor body temperature of a 24-year-old parturient suddenly rose up to 38.7°C. She complains about weakness, headache, abdominal pain, irritability. Objectively: AP-120/70 mm Hg, Ps-92 bpm, t 38.7°C. Bimanual examination revealed that the uterus was enlarged up to 12 weeks of pregnancy, it was dense, slightly painful on palpation. Cervical canal lets in 2 transverse fingers, discharges are moderate, turbid, with foul smell. In blood: sкеocytosis, lymphopenia, ESR - 30 mm/h. What is the most likely diagnosis?

   A. endometritis  
   B. parametritis  
   C. pelviperitonitis  
   D. metrophlebitis  
   E. lochiometra

2. Rise in temperature up to 39°C was registered the next day after a woman had labor. Fetal membranes rupture took place 36 hours prior to labors. The examination of the bacterial flora of cervix uteri revealed the following: haemolytic streptococcus of group A. The uterus tissue is soft, tender. Discharges are bloody, with mixing of pus. Establish the most probable postnatal complication.

   A. metroendometritis  
   B. thrombophlebitis of veins of the pelvis  
   C. infected hematoma  
   D. infective contamination of the urinary system  
   E. apostatis of stitches after the episiotomy

3. On the first day after labour a woman had the rise of temperature up to $39^\circ$C$. Rupture of fetal membranes took place 36 hours before labour. Examination of the bacterial flora of cervix of the uterus revealed hemocatheretic streptococcus of A group. The uterus body is soft, tender. Discharges are bloody, with admixtures of pus. Specify the most probable postnatal complication:
A. metroendometritis
B. thrombophlebitis of veins of the pelvis
C. infectious hematomas
D. infective contamination of the urinary system
E. apostasis of sutures after the episiotomy

4. A woman of a high-risk group (chronic pyelonephritis in anamnesis) had vaginal delivery. The day after labour she complained of fever and loin pains, frequent uroodynia. Specify the most probable complication:

1. infectious contamination of the urinary system
2. thrombophlebitis of veins of the pelvis
3. infectious hematomas
4. endometritis
5. apostasis of sutures after episiotomy

5. A woman had the rise of temperature up to 39°C on the first day after labour. The rupture of fetal membranes took place 36 hours before labour. The investigation of the bacterial flora of cervix of the uterus revealed hemocatheretic streptococcus of group A. The uterus body is soft, tender. Discharges are bloody, mixed with pus. Specify the most probable postnatal complication:

A. metroendometritis
B. thrombophlebitis of pelvic veins
C. infected hematomas
D. infection of the urinary system
E. apostasis of junctures after the episiotomy

6. A parturient complains about pain in the mammary gland. Palpation revealed a 3х4 cm large infiltration, soft in the centre. Body temperature is 38.5°C. What is the most probable diagnosis?

A. acute purulent mastitis
B. pneumonia
C. cleuritis  
D. retention of milk  
E. birth trauma

7. A woman consulted a doctor on the 14th day after labour about sudden pain, hyperemy and induration of the left mammary gland, body temperature rise up to 39°C, headache, indisposition. Objectively: fissure of nipple, enlargement of the left mammary gland, pain on palpation. What pathology would you think about in this case?
   
   A. lactational mastitis  
   B. lacteal cyst with suppuration  
   C. fibrous adenoma of the left mammary gland  
   D. breast cancer  
   E. phlegmon of mammary gland

8. On the tenth day after discharge from the maternity house a 2-year-old patient consulted a doctor about body temperature rise up to 39°C, pain in the right breast. Objectively: the mammary gland is enlarged, there is a hyperemized area in the upper external quadrant, in the same place there is an ill-defined induration, lactostasis, fluctuation is absent. Lymph nodes of the right axillary region are enlarged and painful. What is the most likely diagnosis?
   
   A. lactational mastitis  
   B. abscess  
   C. erysipelas  
   D. dermatitis  
   E. tumour

9. Examination of placenta revealed a defect. An obstetrician performed manual investigation of uterine cavity, uterine massage. Prophylaxis of endometritis in the postpartum period should involve following actions:
   
   A. antibacterial therapy  
   B. instrumental revision of uterine cavity
C. haemostatic therapy
D. contracting agents
E. intrauterine instillation of dioxine

10. On postoperative day 3 after an uncomplicated repeat cesarean delivery, the patient develops a fever of 38.2°C (100.8°F). She has no complaints except for some fullness in her breasts. On examination she appears in no distress; lung and cardiac examinations are normal. Her breast examination reveals full, firm breasts bilaterally slightly tender with no erythema or masses. She is not breast-feeding. The abdomen is soft with firm, nontender fundus at the umbilicus. The lochia appears normal and is nonodorous. Urinalysis and white blood cell count are normal. Which of the following is a characteristic of the cause of her puerperal fever?

A. is less severe and less common if lactation is suppressed
B. appears in less than 5% of postpartum women
C. appears 3 to 4 days after the development of lacteal secretion
D. is almost always painless
E. fever rarely exceeds 37.8°C (99.8°F)

SITUATIONAL TASKS

1. A 26-year-old G1P1 is now postoperative day (POD) 6 after a low transverse cesarean delivery for arrest of active phase. On POD 2, the o have uterine tenderness and foul-smelling lochia. She was started on broad-spectrum antibiotic coverage for endometritis. The patient states she feels fine now and wants to go home, but continues to spike fevers each evening. Her lung, breast, and cardiac examinations are normal. Her abdomen is nontender with firm, nontender uterus below the umbilicus. On pelvic examination her uterus is appropriately enlarged, but nontender. The adnexa are nontender without masses. Her lochia is normal. Her white blood cell count is 12 with a normal differential. Blood, sputum, and urine cultures are all negative for growth after 3 days. Her chest x-ray is negative. What is this patient’s condition?
2. A 35-year-old G3P3 presents to your office 3 weeks after an uncomplicated vaginal delivery. She has been successfully breast-feeding. She complains of chills and a fever to 38.3°C (101°F) at home. She states that she feels like she has flu, but denies any sick contacts. She has no medical problems or prior surgeries. The patient denies any medicine allergies. On examination she has a low-grade temperature of 38°C and generally appears in no distress. Head, ear, throat, lung, cardiac, abdominal, and pelvic examinations are within normal limits. A triangular area of erythema is located in the upper outer quadrant of the left breast. The area is tender to palpation. No masses are felt and no axillary lymphadenopathy is noted. Which is the best option for treatment of this patient?

3. A 32-year-old G2P2 develops fever and uterine tenderness 2 days after cesarean delivery for nonreassuring fetal heart tones. She is placed on intravenous penicillin and gentamicin for her infection. After 48 hours of antibiotics she remains febrile, and on examination she continues to have uterine tenderness. Which of the bacteria is resistant to these antibiotics and is most likely to be responsible for this woman’s infection?

4. A 23-year-old G2P2 requires a cesarean delivery for arrest of active phase. During labor she develops chorioamnionitis and is started on ampicillin and gentamicin. The antibiotics are continued after the cesarean delivery. On postoperative day 3, the patient remains febrile and symptomatic with uterine fundal tenderness. No masses are appreciated by pelvic examination. She is successfully breast-feeding and her breast examination is normal. Which antibiotic should be initiated to provide better coverage?

5. A 28-year-old G2P2 presents to the hospital 2 weeks after vaginal delivery with the complaint of heavy vaginal bleeding that soaks a sanitary napkin every hour. Her pulse is 89 beats per minute, blood pressure 120/76 mm Hg, and temperature 37.1°C. Her abdomen is nontender and her fundus is located above the symphysis pubis. On pelvic examination, her vagina contained small blood clots and no active bleeding is noted from the cervix. Her uterus is about 12 to 14 weeks size and
nontender. Her cervix is closed. An ultrasound reveals an 8-mm endometrial stripe. Her hemoglobin is 10.9, unchanged from the one at her vaginal delivery. β-hCG is negative. Which potential treatments would be contraindicated?