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# POSTPARTUM PYOSEPTIC DISEASES

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- Diseases observed in the puerperas and directly related to pregnancy and childbirth (from the time of delivery until 6 weeks afterwards)
  - Postpartum or puerperal infection is a general term used to describe any bacterial infection of the genital tract after delivery.

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- Postpartum purulent-septic diseases represent a serious problem and are one of the main causes of maternal morbidity and mortality
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- Preeclampsia, obstetrical hemorrhage and puerperal infection formed the lethal triad of causes of maternal deaths for many decades of the 20-21th centuries.
  - The frequency of septic postpartum diseases is high, from 5 to 20%.
  - Maternal deaths from infection have become uncommon - because of effective antibiotics.

# Predisposing factors

- Physiological changes in the woman: hormonal, immune, mental
- An extensive wound surface in the uterine cavity (placental area), which has a communication with the vaginal microflora
- Injuries of the soft tissues of the birth canal (obstetrical trauma)
- Operational delivery - presence of suture material and the formation of a focus of ischemic necrosis of infected tissues along with a cut on the uterus create ideal conditions for septic complications
- Bleeding
- Prolonged labor and premature rupture of amniotic membranes that lead to chorioamnionitis
- Complications of pregnancy (anemia, preeclampsia, placenta previa, etc.)
- low social level in combination with poor nutrition and unsatisfactory hygiene

# Etiology

- The main pathogens of obstetric septic complications are associations of gram-positive and gram-negative anaerobic and aerobic microbes, with the predominance of opportunistic microflora.

Staphylococcus aureus

Streptococci

Enterococcus

Pseudomonas aeruginosa

Listeria

Escherichia, Proteus, Klebsiella / Citrobacter

- In the last decade, a new role in these associations has also been played by new-generation infections that are transmitted sexually: chlamydia, mycoplasmas, viruses, etc

# Classification of postpartum pyoseptic diseases (according to Sazonov-Bartels)

Stage 1 - the infection is limited to the area of the birth wound (endometritis, postpartum ulcer)

Stage 2 - infection, localized in the small pelvis (parametritis, salpingitis, pelvic peritonitis, vein thrombophlebitis, femoral veins)

Stage 3 - infection by clinical manifestations is similar to generalized (peritonitis, progressive thrombophlebitis)

Stage 4 - generalized infection (sepsis, septic shock)



# 1 stage



# Stage 1 - wound infection

- Occur 3-4 days after delivery
  - Purulent-necrotic plaque,
  - Odema and hyperemia of surrounding tissues in the wound area,
  - Pain
- The general condition is good, but may be a low-grade fever



# Treatment

- In the case of infiltration of the edges of the wound, purulent discharge from the wound, the opening of the sutures - the seams to dissolve
- open wound management, if necessary – drainage
- Treatment of the wound with antiseptics;
- Antibiotic therapy

# Postpartum endometritis

The most common form of bacterial infection in obstetrics

Frequency after spontaneous physiological birth 1 - 5%

The frequency after pathological delivery is 15-20%

After caesarean section > 20%

FORMS: classical, erased, abortive and endometritis after caesarean section

# Pathogenesis

- The spread of infection in the uterus occurs:
  - Ascending way
  - Hematogenous by
  - Lymphogenous
  - Intraamniacal (amnioscopy, amniocentesis)
- Risk factors:
  - Delayed involution of the uterus (subinvolution) and widening of its cavity of the lochia (post-partum discharges)


# Endometritis after cesarian section

Ways:

- Infection in the cavity of the uterus – 12 hours after rupture of membranes, chorioamnionitis
- Infection in the abdominal cavity
- Paresis of the intestine – after 12 hours microbes can pass through the intestine wall




# Diagnostics

- Monitoring of clinical and laboratory indicators
  - Ultrasound of the pelvic organs in all puerperas on 3 - 5 days
  - Bacteriological – discharges from the uterus
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# Complex therapy PE

- Antibacterial
  - Infusion therapy
  - Uterotonic
  - Anti-inflammatory
  - Immunomodulating
  - Antifungal
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combinations of penicillins with inhibitors / beta-lactamases, for example combinations of amoxicillin / clavulanic acid (augmentin). A single dose of augmentin - 1.2 g IV, daily - 4.8 g, course - 24 g;

cephalosporins II generation in combination with nitroimidazoids and aminoglycosides, for example, cefuroxime + metrogyl + gentamicin:

- cefuroxime in a single dose of 0.75 g, a daily dose of 2.25 g, a course dose of 11.25 g;
- Metrogil in a single dose of 0.5 grams, a daily dose of 1.5 grams, a course dose of 4.5 grams;
- gentamycin in a single dose of 0.08 g, a daily dose of 0.24 g, a course dose of 1.2 g;
- Intra-operatively intravenously, 1.5 g of cefuroxime and 0.5 g of metrogyl are injected;

cephalosporins I generation in combination with nitroimidazoles and aminoglycosides, for example, cefazolin + metrogyl + gentamicin:

- cefazolinum in a single dose of 1 g, a daily dose of 3 g, a course dose of 15 g;
- Metrogil in a single dose of 0.5 grams, a daily dose of 1.5 grams, a course dose of 4.5 grams;
- gentamycin in a single dose of 0.08 g, a daily dose of 0.24 g, a course dose of 1.2 g;
- Intra-operatively intravenously, 2.0 g of cefazolin and 0.5 g of metrogyl are injected.

At the end of antibiotic therapy, all patients should make correction of the biocenosis with therapeutic doses of probiotics: lactobacterin or acylactone (10 doses 3 times) in combination with stimulants of normal intestinal microflora growth (for example, hilak forte 40-60 drops 3 times a day) and enzymes festal, mezim forte for 1-2 tablets at each meal).

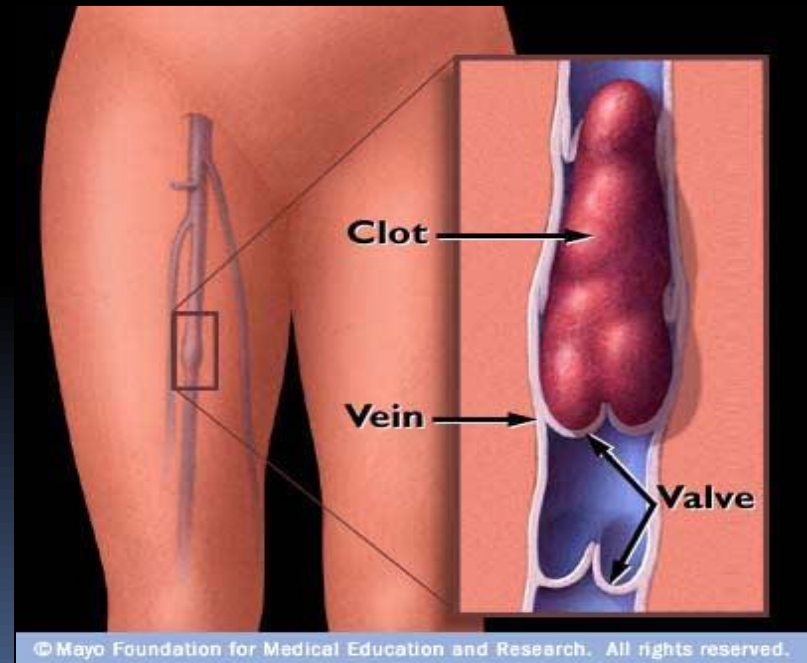
- The volume of transfusions is reasonable 1000-1500 ml per day, the duration of therapy is individual (average 3-5 days). It includes:
  - crystalloids (5 and 10% solutions of glucose and substitutes) that contribute to the restoration of energy resources, as well as electrolyte exchange correctors (isotonic sodium chloride solution, Ringer-Locke solution, lactasol, yonostearil);
  - plasma-replacing colloids (reopolyglucin, hemodes, gelatin, 6 and 10% solutions of HAES sterile);
  - protein preparations (freshly frozen plasma, 5, 10 and 20% albumin solutions);
  - improvement of rheological properties of blood is facilitated by the use of disaggregants (trental, quarantil), which are added respectively 10 ml or 4 ml in infusion media.
- It is mandatory to use funds that help reduce uterus, in combination with antispasmodics (oxytocin 1 ml and no-dose 2.0 v / m 2 times per day).
- The use of antihistamines in combination with sedatives is justified.
- It is advisable to use immunomodulators - thymalin or T-activin 10 mg daily for 10 days (for a course of 100 mg).
- The use of non-steroidal anti-inflammatory drugs with an analgesic and antiaggregatory effect is pathogenetically substantiated. The drugs are prescribed after the abolition of antibiotics. It is recommended to use diclofenac (voltaren) 3 ml IM every day or every other day (for a course of 5 injections).

# Surgical treatment of PE

- Sanitation of the primary focus:
- curettage or vacuum aspiration of the contents of the postpartum uterus
- Intrauterine dialysis
- Extirpation of the uterus with the tubes in the absence of positive dynamics or an increase in the inflammatory response within 24-72 hours

## 2 stage –postpartum trombophlebitis

*Trombophlebitis* – inflammation of the walls of the veins and trombosis



# Thrombophlebitis of superficial veins




- Soreness in walking, infiltration along the vein, skin hyperemia, low-grade fever

# Deep vein thrombophlebitis

- Swelling of the limb;
- Heaviness in the legs;
- Glossy skin with a pattern of subcutaneous veins;
- Pain in the inner surface of the foot, shin, thigh;
- Signs of intoxication





# Conservative treatment of thrombophlebitis

- Anticoagulants (low molecular weight heparins, heparin-containing ointments)
- Venotonizing drugs
- Antiplatelet agents
- Antibiotic therapy
- Elastic compression of the lower limbs

# The causes of infection generalizations can be:

- incorrect surgical tactics and inadequate volume of surgical intervention;
- incorrect choice of the volume and components of antibacterial, detoxification and symptomatic therapy;
- decreased or altered immunoreactivity of the macroorganism;
- presence of severe concomitant pathology;
- presence of antibiotic-resistant strains of microorganisms;
- absence of any treatment.



# Stage 3 - Peritonitis



## CAUSES

Insufficiency of sutures on the uterus

Infection of the peritoneum during caesarean section with chorioamnionitis

Increase in permeability of intestinal walls due to the paresis

# Peritonitis (diagnosis)


- Clinical signs: intoxication, peritoneal symptoms, persistent intestinal paresis, leukocytosis
- Ultrasound of the abdominal cavity and uterus
- Radiographic examination of the abdominal cavity organs

# Peritonitis (treatment)

- Extirpation of the uterus with tubes
- Drainage of the abdominal cavity
- Decompression of the digestive tract
- Infusion-transfusion therapy
- Antibiotic therapy
  - Inhibitors of proteases
  - Immunotherapy



# Stage 4

- Systemic inflammatory response to invasion of microorganisms  
Obstetrical sepsis  
Postpartum or post-abortion infectious-inflammatory disease, characterized by generalized infectious disease of the organism with high lethality
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- Inflammation is the normal response of the body to infection; can be defined as a localized protective response to tissue damage, the main task of which is to destroy the microorganism-pathogen and damaged tissues. But in some cases, the body responds to the infection with a massive excessive inflammatory reaction.
- A systemic inflammatory response is a systemic activation of the inflammatory response, secondary to the functional impossibility of mechanisms to limit the spread of microorganisms, the products of their vital functions from the local damage zone,
- Currently, it is proposed to use such a term as "Systemic Inflammatory Response Syndrom (SIRS) syndrome, and consider it as a universal response of the body's immune system to the effect of strong stimuli, including infection. When infected with such irritants are toxins (exo and endotoxins) and enzymes (hyaluronidase, fibrinolysin, collagenase, proteinase), which are produced by pathogenic microorganisms. One of the most powerful triggers of the CASV reaction cascade is lipopolysaccharide (LPS) membranes of gram-negative bacteria.

# Pathogenesis of sepsis

- Exogenous and endotoxins of microorganisms

Activation of lymphocytes, endothelial cells

The release of proinflammatory cytokines (IL-1, TNF), anti-inflammatory cytokines (IL-4, IL-10)

Circulatory disorders + DIC syndrome

Violation of perfusion, acidosis in tissues

Multiple organ failure

# There are three stages in the development of SIRS (R, S. Bone, 1996):

- Stage I - local production of cytokines; in response to the effect of infection, anti-inflammatory mediators perform a protective role, destroy microbes and take part in the healing process of the wound;
- II stage - release of a small amount of cytokines into the systemic circulation; is controlled by anti-inflammatory mediator systems, antibodies, creating prerequisites for the destruction of microorganisms, wound healing and preservation of homeostasis;
- III stage - generalized inflammatory reaction; the number of mediators of the inflammatory cascade in the blood increases as much as possible, their destructive elements begin to dominate, which leads to a disruption of the functions of the endothelium with all the consequences.

# Stages of development of SIRS



- 1 - local - focal outbreak of cytokines
- 2 - systemic - ejection of a small amount of cytokines into the bloodstream, balance of pro- and anti-inflammatory cytokines
- 3 - generalization of the inflammatory reaction, destructive effect of cytokines on the vascular endothelium



# DIAGNOSIS OF SEPSIS

- Primary focus + POI

This is the "second" disease, i.e. There is always a primary focus of infection

The primary focus of infection in obstetric sepsis is the uterus, mammary glands, abscesses of the perineum

# SEPTIC SHOCK

- This is a severe sepsis, which is accompanied by arterial hypotension, a decrease in tissue and organ perfusion

Peripheral vascular collapse + immune blockade

"Chances to die more than recover"

(Prof. Kulikov AV)

# Phases of septic shock

- Early ("warm hypotension")  
high temperatures, tachycardia, low BP, chills
- 2. Late ("cold" hypotension)  
lower BP, lower body temperature, hemorrhages, oliguria
- 3. Irreversible shock (final)  
Anuria, RDS, ICE, coma.

## **Diagnostic measures**

Control of blood pressure, CVP

blood and urine analyses, coagulogram, thermometry

Bacteriological examination of blood

Control of diuresis

Concentration of electrolytes, urea, creatinine, blood gases, pH


ECG, chest thorax, abdominal cavity

# The diagnosis is based on:

- Presence of a septic focus in the body;  
High fever with frequent chills, followed by a sharp decrease in body temperature;  
A drop in blood pressure that does not correspond to hemorrhage;  
Tachycardia, tachypnoe;  
A disorder of consciousness;  
Pain in the abdomen, chest, lower back, limbs, headache;  
Decreased diuresis, up to anuria;  
Petechial rash, necrosis of skin areas;  
Inconsistency of minor local changes in the focus of infection of the severity of the general condition of the patient;  
Diagnosis of DIC-Syndrome (timely evaluation of hemostasis system)



# TREATMENT OF SEPSIS AND SEPTIC SHOCK

- Effective intensive sepsis therapy = complete surgical sanitation of the focus of infection + adequate antimicrobial therapy
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# TREATMENT OF SEPSIS AND SEPTIC SHOCK

- SURGICAL

Curettage of the walls of the uterus  
(In the absence of peritonitis).

Uterus removal

- Ineffectiveness of infusion therapy after curettage of the uterine cavity within 8-12 hours
- peritonitis
- necrosis of sutures on the uterus after cesarean section
- perforation of the uterus, intestine
- purulent endometritis

# TREATMENT OF SEPSIS AND SEPTIC SHOCK

- *Conservative*

Effective intensive sepsis therapy = complete surgical sanitation of the focus of infection + adequate antimicrobial therapy

Antibacterial therapy for sepsis and septic shock?

Cephalosporins 3-4 generations

Carbopenems

Aminoglycosides

Fluoroquinolones

Metronidazole

Antifungal drugs

Respiratory support (AR)

Nutritional support (enteral nutrition)


Immunosuppressive therapy

Prophylaxis of deep vein thrombosis


Methods of extracorporeal detoxification




# TREATMENT OF SEPSIS AND SEPTIC SHOCK

- The earlier,  
The better the prognosis!
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- **Ex. №1.** The 17<sup>th</sup> day postpartum. A woman has high fever for five days, chills, and weakness. Breast is hyperemic, edematous, with a dense infiltration of 6 to 5-cm fluctuations.
  - **The diagnosis? Tactic?**

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- **Ex. №2.** In parturients at 12 days the body temperature rose to 38° C. She complains about the chills, pain in the lower abdomen. Speculum examination shows bloody-purulent vaginal discharge with an unpleasant odor.
  - **The diagnosis? Tactic?**

- **Ex. №3.** 7 days after cesarean section. The body temperature is of  $38^{\circ}\text{C}$ , Ps 98/min. Tongue is dry, coated with white bloom. The abdomen is swollen, painful on palpation, symptoms of peritoneal irritation are positive. Fundus uterus is at the level of symphysis, dense. Breasts are soft, nipples are clean. Urination is free/ There were no gas and defecation in patient.
- **The diagnosis? Tactic?**