High-risk pregnancy and newborn

We describe high-risk pregnancies in women burdened with **risk factors**, which can adversely affect the physiological development of the fetus. ompared to the general population, we observe in this group of patients an increased incidence of **spontaneous abortions**, **perinatal complications** (with the possibility of fetal or maternal death), increased **neonatal mortality**, the occurrence of congenital developmental defects and **other comorbidities** related to the subsequent development of the newborn.

Risk assessment

The harmful effect of risk factors is **multifactorial** (character, duration of exposure to noxia, developmental stage of the fetus, presence of other RFs, etc.). We determine the level of risk individually, based on anamnestic data and current clinical status. We distinguish two groups:

- **Low risk pregnancy**
  - until the 34th week, he will undergo examinations at an interval of 4-6 weeks,
  - from the 34th week until the date of delivery, she undergoes examinations once every 1-2 weeks.
  - from the 40th week of examination at least 2 times a week.
- **Pregnancy with a specifically defined risk** (*Risk pregnancy*)
  - the frequency of visits and the extent of examination are determined individually based on the nature and severity of the pregnant woman's clinical condition.[1]

With each subsequent visit, the level of risk is reassessed, taking into account the current examination results (some risk factors only arise during pregnancy – gestational diabetes, hypertension, etc.).

Family history

We ask about the familial occurrence of genetically determined diseases (trisomy, monogenically inherited diseases, gonosomally linked disorders, etc.), multiple pregnancies, congenital developmental defects.
Systemic diseases with a share of heredity (hypertension, hypercholesterolemia, diabetes, cancer, endocrinopathy, obesity, autoimmune and hematological diseases, etc.).
Spontaneous abortions, stillbirths, premature births and serious complications during pregnancy and childbirth, in the family history, whether the births were natural or caesarean, etc. (primarily for the mother, sisters and grandmothers).

Personal anamnesis

We are interested in the patient's age, height and weight.
Number of children, their postnatal development and diseases. Previous pregnancies (including ectopics, miscarriages and abortions). We ask about the course of the pregnancy, the occurrence of complications (preeclampsia, gestational diabetes, placental ectopy, infectious complications), the delivery (if it was on time, by natural means or caesarean section, about changes in the position of the fetus, the size of the fetus, the outflow and nature of the amniotic fluid, complications during passage through the birth canal, for pathological bleeding during or immediately after childbirth).
We find out the operations that have been performed (mainly in the abdominal and pelvic cavity).
We ask about systemic diseases (heart defects, hypertension, arrhythmia, asthma, allergies, cystic fibrosis, IBD, autoimmune inflammations, diabetes mellitus, hypothyroidism, thyrotoxicosis, polycystic ovary syndrome, cancer and precancers, chronic kidney disease, other developmental defects), genetically determined defects (mainly phenylketonuria), neurological and psychiatric (MS, myopathy, epilepsy, BAP, depression, anxiety, schizophrenia).
As part of psychosocial health, we ask about employment, family background, lifestyle (mainly diet and sleep), possible stress factors, abuse of alcohol, psychotropic drugs and other addictive substances (mainly before the diagnosed pregnancy).

Gynecological history

We find out the beginning and regularity of the cycle, use of hormonal preparations, hormone replacement therapy in the past.
Experienced and diagnosed gynecological diseases (endometriosis, precancers, tumors, myomatosis), repeated infectious complications (vulvovaginitis, cervicitis, PID) and undergone gynecological procedures and operations.
We also detect the presence of STDs (chlamydia, gonorrhea, syphilis, HIV, HSV, trichomoniasis).

Pharmacological history

A very important part. We ask about chronically used medication, especially in connection with the identified diseases. We also ask about the medications used in the period just before pregnancy. Changes in medication during pregnancy are consulted with the attending physicians.

Allergic history

Known allergies to drugs, other allergens, we especially ask about acute reactions requiring hospitalization.

Epidemiological history

We are interested in vaccinations, travel anamnesis (airplane flights), recent contacts with infectious patients.

We ask about infection, experience or risk of contact with infections with a teratogenic effect (toxoplasmosis, rubella, CMV, HSV, HBV, parvovirus B-19, HIV, influenza virus, syphilis, etc.), whether the patient is taking food supplements with a high content of vitamin A and also on exposure to ionizing radiation and recent X-ray or CT examinations.

Risk periods in pregnancy

The most risky period is the 1st trimester when organogenesis takes place. The negative impact of risk factors most often leads to spontaneous abortion, or to severe fetal malformations that are not compatible with life.

0.-3. week (gametopathy)

As the main RF, any changes in the environment of the nidated zygote (scars, infections, developmental defects), as well as exposure to ionizing radiation and X-ray examination are applied. Damage leads to spontaneous abortion ("all or nothing").
In the case of chromosomal abnormalities or congenital developmental defects of germ leaves, malformations occur during development.

4-12 week (embryopathy)

The main risk factors are radiation, medicines in pregnancy, chemicals (teratogens), infection threatening the fetus, hypoxia, ketonemia, diabetic embryopathy, repeated hypoglycemia.
congenital developmental defects occur (depends on the size of the exposure, timing and other factors).

After 12 weeks (fetopathy)

Some viral infections, malnutrition (nutrient deficiency), intrauterine hypoxia, immunological conflict, Erythroblastosis fetalis are considered risk factors in this period.
A defensive reaction of the body occurs and a gradual inflammation of the organs begins to develop, with subsequent hypotrophy of the fetus.

Riskiness and morbidity during childbirth

It includes factors that are directly related to childbirth and can cause disability or death of the newborn, or even the mother.

Prenatal risk conditions

Imminent premature birth

We notice signs of labor already before the end of the 37th gestational week.
It is most often caused by infection, insufficiency of the cervix, or the poor socio-economic status of the mother.

Premature Evacuation of Amniotic Fluid (PEAF)

A condition where the amniotic fluid drains before 12 o'clock. Often caused by pathological vaginal microflora, which causes infection of the amnion before birth. It is associated with a high risk of infectious complications of the fetus and the development of sepsis.

Disrupted birthing mechanism

Any deviation from the physiological course of childbirth. We must anticipate the disease states of the fetus and be prepared for therapeutic intervention (induction of labor, strengthening or suppression of the activity of the uterus, caesarean section, induction of lung maturity, etc.).

Accelerated delivery

Spontaneous labor that lasts less than 3 hours. The cause may be insufficiency of the cervix, hyperactivity of the uterus or increased compliance of the birth canal. It leads to an increased risk of birth trauma and newborn asphyxia.

Prolonged labor

Duration for primiparous longer than 20 hours, for multiparous longer than 14 hours. The cause is usually the weak activity of the uterus, anomalies of the birth canal, or inappropriate position of the fetus. There is a risk of trauma, asphyxia and fetal infection.

Assisted birth

Using pliers or a vacuum extractor. The aim is to shorten II. the period of labor in prolonged labor, when a caesarean section is no longer possible. The condition is associated with risks of trauma.

Sudden conditions during childbirth

Acute situations that threaten newborns with hypoxia.

- **Abruption of the placenta** – due to trauma or changes in blood vessels (hypertension, eclampsia). The risk of developing hypoxia, shock, and in a milder case, fetal anemia.
- **Placenta praevia (placenta praevia)** – depending on the intervention in the lower uterine segment, we divide it into marginal, partial and total. It is manifested by repeated bleeding, leading to anemization of the mother, blocking the descent of the fetus through the birth canal, which can lead to abortion.
- **Perinatal asphyxia** (acute placental gas exchange disorder) – leads to a decrease in O_2 and

accumulation CO_2 (respiratory acidosis), metabolic acidosis also develops due to the subsequent anaerobic glycolysis.
- Abnormalities of the birth mechanism, birth bleeding, and long-term hypoxia of the fetus are the causes.
- Apgar score and acid-base balance examination are essential in diagnosis.

At-risk newborn

Classification of risk groups of newborns:

According to gestational age

- **premature** (immature, premature) – born before the 37th week of pregnancy;
- **full term** – born between 37 and 42 weeks of pregnancy;
- **over carried** – born after 42 weeks of pregnancy.

By birth weight

- **> 4 kg** – newborn with a large birth weight;
- **2,5 – 4 kg** – newborn with normal birth weight;
- **< 2,5 kg** – newborn with low birth weight;
- **< 1,5 kg** – newborn with very low birth weight;
- **< 1 kg** – newborn with extremely low birth weight.

According to the relationship between gestational age and birth weight

- **hypertrophic newborn** – with birth weight > 95th percentile;
- **eutrophic newborn** – with a birth weight between the 5th and 95th percentile;
- '''eutrophic newborn''' – with birth weight < 5th percentile.[2]

After discharge, a high-risk newborn requires comprehensive monitoring focused on prevention, detection and treatment of specific consequences of birth stress.

Newborn of a drug-addicted mother

Most common abuse: **alcohol**, **benzodiazepines**, **marijuana**, **opiates** (codeine, heroin, morphine), **barbiturates**, amphetamine, cocaine. Overuse of substances leads to a significant influence on the metabolic and regulatory processes of the fetus, which lead to growth restriction and numerous disorders at the organ and functional level. Alcohol has also been shown to have a teratogenic effect, causing fetal alcohol syndrome (low birth weight, microcephaly, mental and motor retardation, typical facial appearance with a smoothed filter).

These are usually women with a low socio-economic status, among whom there is also a high incidence of sexually transmitted diseases (hepatitis, HIV, syphilis, herpes viruses), which contribute to fetal damage with their teratogenic effect. This lifestyle usually leads to reduced immune mechanisms and more frequent infectious complications. Seeding of genital herpes is a contraindication to natural childbirth. Ascending infection, the development of PID, and the risk of fetal sepsis can also occur.

When all these factors are combined, the risk of abortion, premature birth and SIDS increases significantly.

Within 3 days after birth, the newborn may develop **neonatal abstinence syndrome** (50-90%). Severity depends on the duration of the mother's use of addictive substances and the length of the interval between the administered substance and the birth. Clinical manifestations may vary depending on the substance used. It usually presents with non-specific symptoms (high-pitched cry, short sleep time after eating, increased Moro reflex, tremors, hypertension, convulsions, feeding problems, vomiting, loose stools, fever, tachypnea, tachycardia).

Early diagnosis is often difficult, because mothers usually keep the addiction a secret. Through the anamnesis, we find out the type of substance, the duration of use, the time of the last dose. According to the presence of symptoms, we determine the score according to Finnegan. Toxicological examination of newborns is carried out from urine, cerumen, umbilical cord blood, peripheral blood and hair. We examine the mother's blood and urine. At the same time, we carry out laboratory diagnostics to rule out other diseases.

The most important step in therapy is the introduction of regimen and nutritional measures. We move the child to a quiet, dark place with room temperature. Careful handling and monitoring of vital functions is important. We allow breastfeeding only for fully abstinent mothers (interruption of breastfeeding would lead to the acute development of withdrawal symptoms). Substitution therapy (morphine, phenobarbital, diazepam) is indicated for newborns who have a high score according to Finnegan. It is given in low doses, along with the improvement of the clinical condition, the doses are gradually reduced.

🔎 *For more information see Newborn of a drug-addicted mother.*

The newborn of a diabetic mother

In pregnant women, we distinguish diabetes I. and II. of the type that were already diagnosed before pregnancy, and gestational diabetes, which occurs in connection with pregnancy and disappears during the six months of pregnancy. The type of diabetes does not play a major role in risk influencing the development of the fetus.

Sufficient correction of glycemia and glycated hemoglobin levels is an essential factor. Pathology develops as a result of long-term uncorrected hyperglycemia, which correlates with the level of glycemia and the duration of these conditions. Risks for the mother include the formation of an excessive amount of amniotic fluid (polyhydramnios), the development of hypertension, urogenital diseases, women with gestational diabetes have a high risk of developing diabetes in the following years of life. Intrauterine death of the fetus or newborn often occurs.

Hyperglycemia significantly increases the incidence of congenital developmental defects (up to 4x higher risk). Specifically, diabetic fetopathy (macrosomia > 4000 g, pulmonary immaturity, hypoglycemia, hypocalcemia, and hyperbilirubinemia) may occur. The excessive size of the fetus leads to numerous traumas for both the mother and the newborn during childbirth (torsion of the shoulder blades). We usually indicate cesarean delivery. Lung immaturity is a risk factor for the development of respiratory distress syndrome. At the same time, the newborn has an increased risk of developing diabetes I and II. degrees already in early childhood.

Screening of pregnant women using oGGT in the 24th week of pregnancy helps to detect the development of gestational diabetes. This is usually only solved by dietary measures. In the case of non-reducing glucose levels, we indicate the administration of fast-acting human insulin.

For women with a known diagnosis of diabetes, a planned pregnancy with careful preparation (4-6 months) is recommended. The preparation includes correction of blood glucose after discontinuing oral antidiabetic drugs and starting insulin therapy, and multiple examinations of organ systems that can be damaged in diabetes. A fully compensated diabetic woman must follow the prescribed dietary measures during pregnancy. She is automatically placed in the group of women with a high-risk pregnancy.

🔎 *For more information see The newborn of a diabetic mother.*

Maternal infection during pregnancy

During pregnancy, there is a slight decrease in immunity. This increases the risk of infectious disease for both the mother and the fetus, ongoing infections tend to have a severe course. Routes of penetration are ascending (per continuitatem from the birth canal/endometrium of the mother, e.g. during urogenital infections), hematogenous (from the mother's bloodstream through the placental barrier) and descending (from the fallopian tubes).

Both infections causing severe inflammation and teratogenic agents, often with mild symptoms during infection, are risky during pregnancy. They negatively affect the development of the fetus and lead to miscarriage or extensive malformations.

Inflammatory diseases

- **Infected abortion** (endotoxin shock, leukopenia, thrombocytopenia, high hematocrit).
- **Ascending infection** (after the outflow of amniotic fluid, streptococci, [[E. coli]).
- Infection after dg. procedures (amniocentesis, chorionic villus sampling, fetoscopy, ...).
- **Puerperal sepsis** (residua post partum, mastitis).

Infection caused by the bacteria Streptococcus agalactiae (GBS)

The most common life-threatening disease of newborns (death 24 hours after manifestation). Mortality 20-30%. About 30% of women form part of the vaginal physiological microflora. Infection of the newborn occurs through intrapartum transmission from the birth canal. Risk factors include delivery of premature newborns, premature outflow of amniotic fluid, low gestational age, fever during labor, etc.
Early infections (80%) usually occur under the guise of neonatal sepsis. The late one is more often manifested as meningitis.
Screening for the detection of GBS as part of the microflora is carried out on the 35th-37th. gestational week. In the event of a positive detection, we indicate an ATB barrier during childbirth (including penicillin).

Gonorrhea

STD, causes inflammation of the cervix and urethra. Transmission to newborns at birth (blepharitis, keratitis, pneumoinitis, meningitis).
Treated by ATB (cephalosporins, penicillin, macrolides).

CHLUM (Chlamydia, ureaplasma, mycoplasma)

Intracellular bacterial infection, the most common STD. They cause PID, infertility and ectopic pregnancy. They are usually asymptomatic.
They increase the risk and morbidity of RDS in newborns, cause atypical pneumonia and conjunctivitis.

Infections with a teratogenic effect

Infection during pregnancy with proven teratogens (syphilis, toxoplasmosis, rubella, parvovirus B19, VZV, HBV, HIV, CMV, HSV, *Listeria monocytogenes , Borrelia burgdorferi*, etc.) leads to fetal malformations of varying degrees, up to intrauterine death.[3] Detected infection with these pathogens is a medical indication for abortion (up to the 24th week of pregnancy).

HIV

In order to prevent the transplacental transmission of HIV+ infection from the mother to the fetus, we indicate the prophylactic administration of antiretroviral therapy throughout pregnancy. We give birth by caesarean section (to avoid mixing the blood of the mother and the fetus). Lactation is often suspended due to the

presence of viruses in the milk.

VZV
When the disease is exacerbated, the replicated virus can cross the placenta and cause neonatal varicella, which creates numerous scars as it heals, causing extensive malformations.
We administer acyclovir as part of the therapy.

Rubella
A significant teratogen, upon exposure more than 80% of pregnant women develop serious developmental defects (cataracts, deafness, congenital heart defects). Termination of pregnancy is always indicated.
A preventive measure is collective immunity obtained by vaccination.

CMV
A very widespread disease in the population that persists in the body after primary infection. It occurs asymptomatically in healthy individuals.
The risk of a teratogenic effect is highest during primary infection during pregnancy. In persistent infections, a significant reduction in immunity can lead to reactivation of the virus, which causes very serious malformations (mortality 30%).

HSV
Primary infection during pregnancy has very serious consequences for the fetus (especially in late pregnancy). About 99% of infected newborns are affected and the mortality rate is 40-60%. The main manifestations include generalized skin rash, severe eye damage and life-threatening encephalitis.
When genital herpes is reactivated and seeded, it can be transmitted to the fetus during natural childbirth. For women with an active infection, we give Herpesin as a preventive measure and indicate delivery by caesarean section.

Syphilis
Part of the screening, the incidence is increasing rapidly. Affecting the fetus (congenital syphilis) depends on the stage of infection and the gestational age of the fetus. Infection in the first trimester without treatment leads to abortion. During treatment (penicillin) the pleob is not affected.

- ***Syphilis congenita tarda*** (infection in the II trimester, latent stage)
  - Manifestations after the 5th year, Hutchinson's triad (keratitis, vestibular deafness, barrel-shaped incisors), tabes dorsalis, inflammation of the II nerve, caput quadratum , saber-shaped tibia, parrot grooves, saddle-shaped nose, Gothic palate.
- ***Syphilis congenita praecox*** (infection in the III trimester, secondary stage)
  - Manifestation in newborns, maculopapulopustular exanthema healing with scars (Parrot lines), skin looking old, atrophic, enanthemas on mucous membranes, coryza syphilitica, pneumonia alba, flinty liver, pemphigoid, alopecia, anemia.

Toxoplasmosis
Protozoal infection occurs asymptomatically in the general population. Primary infection in pregnancy causes granulomatous inflammation - Sabin's tetrad (hydrocephalus, chorioretinitis, encephalitis, CNS calcification).
Therapy – rovamycin, spiramycin

🔎 *For more information see Infection threatening the fetus.*

Links

References

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