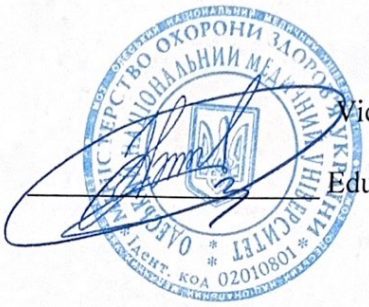
MINISTRY OF HEALTH OF UKRAINE
ODESA NATIONAL MEDICAL UNIVERSITY

International Faculty
Department of obstetrics and gynecology



CONFIRMED by
Vice-rector for scientific and pedagogical work
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September 1, 2023

METHODOGICAL RECOMMENDATIONS

FOR PRACTICAL CLASS

International Faculty, Course V
Discipline "Obstetrics and Gynecology"
Practical lesson №17. Topic: Isoantigenic incompatibility of maternal and fetal blood."

Approved:

Meeting of the Department of Obstetrics and Gynecology of Odesa National Medical University

Protocol No. 1 dated August 28, 2023.

Head of the Department_____ (Ihor GLADCHUK)

Developer:
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Practical class №17.

ISOANTIGENIC INCOMPATIBILITY OF MATERNAL AND FETAL BLOOD

LEARNING OBJECTIVE: The overall aim of this topic is to gain basic knowledge about physiological changes in postpartum period, physiology of lactation and breastfeeding, primary care of newborn in order to make recommendations for management of puerperium and neonatal period and advice woman on discharge.

BASIC CONCEPTS: Immunological incompatibility of maternal and fetal blood (Rh-, ABO-system, isoleukocyte, etc.). Pathogenesis, diagnosis, management, treatment, and prevention.

EQUIPMENT

- Multimedia equipment (computer, projector, screen), TV.
- Obstetric models and obstetric instruments (pelvimeter, obstetric stethoscope, centimeter tape).
- Professional algorithms, structural-logical schemes, tables, videos.
- Results of laboratory and instrumental researches, situational tasks, patients, medical histories.

EDUCATIONAL TIME – 4 h

1. **ORGANIZATIONAL STAGE**
   - Greetings,
   - checking attendees,
   - defining of educational goals,
   - providing of positive motivation.

Among the clinical variety of forms of this pathology, the most known and learned a small amount of hemolytic dieses (HD) to the fetus and non-malignancy, which develops in the midst of the insane organisms of the mothers and antibodies of the fetus after The knowledge of the nutrition of the etiopathogenesis of ailments, the peculiarities of obstetric and perinatal tactics, allows in the significant world to change the number of unwelcoming inheritances for the fetus, because of the relevance of the inception of this pathology.

2. **CONTROL OF BASIC KNOWLEDGE** (written work, written testing, online testing, face-to-face interview, etc.)

2.1. Requirements for the theoretical readiness of students to perform practical classes.

Knowledge requirements:

– Communication and clinical examination skills.
– Ability to determine the list of required clinical, laboratory and instrumental studies and evaluate their results.
– Ability to make a preliminary and clinical diagnosis of the disease
– Ability to perform medical manipulations
– Ability to determine the tactics of physiological pregnancy, physiological labor and the postpartum period.
– Ability to keep medical records.

List of didactic units:

- Etiopathogenesis of HD of the fetus and infant.
– classification and clinic of HD.
– methods of ante- and postnatal diagnosis of HD
– principles of isoimmunization therapy and HD in the antenatal and early neonatal periods
– methods of isoimmunization prevention

2.2. Questions (test tasks, tasks, clinical situations) to test basic knowledge on the topic of the class.

Questions

– determine the Rh- and AB0-affiliation of maternal and fetal blood
– interpret the data of immunological, biochemical, cardiotocographic studies, analyze ultrasound results
– make a plan for Rh-negative unimmunized pregnant women
– make a plan for Rh-negative pregnant woman with isoimmunization
– determine the indications for specific prevention of Rh-immunization in non-immunized pregnant women and women in labor
– substantiate the diagnosis and make a treatment plan for a pregnant woman with isoimmunization, determine the tactics of delivery in immune-conflict pregnancy
- Explain the pathogenesis of essential hypertension fetus and infant.
- Describe the clinical characteristics of different forms of GD.
- List the diagnostic methods GD fetus and infant.
- Describe the principles of pregnant women with isoincompatibility.
- Describe the main treatment of hemolytic disease in the antenatal period.
- State the principles of treatment of hemolytic disease in the early neonatal period.
- What are the methods of prevention of Rh -conflict.

Tests

1. Pregnant with blood group B (III) Rh (-) 24 weeks of pregnancy revealed titer Rh antibody 1: 8. The first pregnancy ended antenatal fetal death due to Rh-conflict. The general condition is satisfactory. Tonus of uterus is normal. Position of the fetus is longitudinal, presenting part is head, heart rate - 146 beats / min. No edema. Your tactics?
A. Natural labor, waiting tactics.
B. Repeat analysis for Rh antibodies after 2 weeks
C.Send for consultation to therapist.
D. Send for consultation to immunologist
E. Dynamic observation in antenatal clinic.

2. A pregnant 22 years old. Pregnancy is first. The examination determined Rh negative blood type A (II) in December. From history was found that as a child she spent hemotherapy. A man has Rh-positive blood type 0 (I) gr. How often to determine the blood of pregnant Rh antibodies?

A. Definition of antibodies in the blood of pregnant each month.

B. Determination of antibody 1 per month in the first half of pregnancy and 2 times a month in the second half.

C. Determination of antibodies in the blood of pregnant women during her first visit, at 20 weeks term, then every 4 weeks

D. Determination of antibody every two weeks.

E. Determination of antibodies twice during pregnancy.

3. Second gravida has the blood group 0 (I) Rh (-), at term 35 weeks of pregnancy was diagnosed antenatal fetal death. Three days ago titer Rh antibody was 1: 128, ultrasound signs of hepatosplenomegaly, ascites of the fetus, placenta edema, non-stress test was abnormal. From the proposed delivery refused pregnant. What is the reason antenatal fetal death?

A. Rh - imunisation
B. Intrauterine infection
C. Congenital defect of the fetus
D. ABO conflict
E. Fetal hypoxia

4. Second gravida, in term 34 weeks of gestation during next visit complained of shortness of breath and a rapid increase in the abdomen. OBJECTIVLY: height of fundus of the uterus is 40 cm, abdominal circumference is 102 cm. Presenting part is head, its movabale

above the pelvic inlet, fetal heart 132 bpm. / Min. During ultrasound examination was diagnosed polyhydramnios, ascites and hydrothorax in the fetus, placenta is thick. Choose tactics management of pregnancy.

A. Determine fetal biophysical profile
B. Determine blood flow in the vessels of the umbilical cord with dopplerometry
C. ECG
D. Labor induction
E. amniocentesis is necessary to do

5. Pregnant 17 years, and pregnancy 8-9 weeks, ending in a complete abortion. Blood group O (I) Rh negative, in men - A (II) Rh positive. No rhesus antibodies were detected in the woman's blood. Doctor's tactics.

A. Prophylactic administration of Rh-immunoglobulin IM woman
B. Monitoring the level of anti-rhesus blood in women
C. Prophylactic administration of Rh-immunoglobulin IM man
D. Hemodialysis
E. Autohemotherapy

6. Second gravida C., at 28 weeks of pregnancy has the Rh- antibodies titer 1: 8. She gave birth to child with symptoms of hemolytic disease. When should you check Rh-antibodies titer?

A. Re-determination of antibodies in 1 week
B. Re-determination of antibodies in 1 month
C. Re-determination of antibodies in 3 weeks
D. Re-determination of antibodies in 1 day
E. Re-determination of antibodies after 2 weeks

7. A. A pregnant, 34 weeks gestation, is at the department of pathology. She has Rh-antibodies titer 1:32. From history, she had ectopic pregnancy with level of Rh-antibodies 1: 2 in 14 weeks. What should you do?

A. Re-determination of antibodies in 1 day
B. Cordocentesis
C. Early delivery
D. Blood transfusion
E. ECTG

8. 24 y.o. woman with Rh-negative blood , admitted to Obstetrician at term 10 weeks of pregnancy. Current pregnancy is third; first pregnancy finished normaly six years

ago, the child is healthy; second - miscarriage at 16 - 17 weeks of pregnancy. After birth detected diabetes class "B". The titer of Rh-antibodies 1: 16-1: 32. Correct tactic is :

A. prolongation of pregnancy , prescribe needed dose of insulin.
B. prolongation of pregnancy, dietotherapy .
C. prolongation of pregnancy with regular determination of blood glucose.
D. prolongation of pregnancy with the introduction of the suspension lymphocytic blood man.
E Stop pregnancy (abortion).

9. Time to give anti-D-imunohlobulyn in puerperium period is:

A. In the first 24 hours after birth.
B. In the early postnatal period.
C. During the first 72 hours.
D. During the first 96 hours.
E. After 1 month postpartum.

10. Secundipara , 26 y.o. addressed to the department of pathology pregnancy at term 32-33 weeks. Blood A (II), Rh-negative. From the history she gave bith for two Rh-positive healthy kids. Antibodies titers during pregnancy is on the level 1:32, not growing. The patient must be delivery:

A. gestational age 34-35 weeks.
B. At 37-38 weeks.
C. Immediately.
D. At 40 weeks.
E. Since the beginning of the spontaneous labor.

11. On the 1st day of life a full-term girl (2nd labour) weighing 3500g, with Apgar score of 8 points, presented with jaundice. Indirect bilirubin of blood - was 80 micromole/ l, 6 hours later - 160 micromole/l. What is the optimal method of treatment?

A. Infusion therapy
B. Phototherapy
C. Exchange blood transfusion
D. Phenobarbital treatment
E. Enterosorbents

12. A primigravida is 22 years old. She has Rh(-), her husband has Rh(+). Antibodies to Rh weren't found at 32 weeks of pregnancy. Redetermination of antibodies to Rh didn't reveal them at 35 weeks of pregnancy as well. How often should the antibodies be determined hereafter?

A. There is no need in further checks
B. Once in two weeks
C. Once in three weeks
D. Monthly
E. Once a week

13. A multigravida with Rh- isosensitization was found to have a decrease in anti-Rh titer from 1:32 to 1:8 at 33-34 weeks of gestation. Ultrasound revealed double contour of head, enlargement of fetal liver, placental thickness of 50 mm. The patient has indication for:
A. Repeated (after 2 weeks) USI
B. Course of desensitizing therapy
C. Plasmapheresis
D. Premature delivery
E. Administration of anti-Rh gamma globulin

14. Rh-negative woman with 32-weeklong term of pregnancy has been examined. It was observed that Rh-antibodies titer had increased four times within the last 2 weeks and was 1:64. First two pregnancies ended in antenatal death of fetus caused by hemolytic disease. What tactics of pregnancy management should be chosen?
A. Preterm delivery
B. Delivery at 37 weeks term
C. Rh-antibody test in 2 weeks; if Rh-antibodies increase in number conduct delivery
D. Introduction of anti-Rh immunoglobulin
E. US examination to determine signs of fetal erythroblastosis

15. Examination of a Rh-negative pregnant woman at 32 weeks of gestation revealed a four-time rise of Rh-antibody titer within 2 weeks, the titer was 1:64. In the first two pregnancies the patient had experienced antenatal fetal death due to hemolytic disease. What is the optimal tactics of pregnancy management?
A. Early delivery
B. Delivery at 37 weeks of gestation
C. Screening for Rh-antibodies 2 weeks later and early delivery in case of further titer rise
D. Introduction of anti-Rh (D) immunoglobulin
E. Ultrasound for signs of hemolytic disease of the fetus

16. A woman with blood group B(III) Rh(+) gave birth to a full-term healthy boy. Examination on the 3rd day of the infant's life shows him to have icteric tint to his skin. The child has no problems with suckling, sleep is nondisturbed. The abdomen is soft, the liver protrudes by 2 cm from under

the costal margin. Complete blood count: hemoglobin -200 g/L, erythrocytes - 5.5 · 1012/L, total bilirubin – 62 mcmol/L, indirect bilirubin – 52 mcmol/L. What condition can be suspected?
A. Physiologic jaundice
B. Congenital hepatitis
C. Hemolytic disease of the newborn due to Rh incompatibility
D. Biliary atresia
E. Hemolytic disease of the newborn due to ABO incompatibility

17. A 30-year-old woman in childbirth gave birth to a child with an anemic-jaundiced form of hemolytic disease. Blood group in woman A (II) Rh−, blood group in newborn B (III) Rh +, in father of newborn also B (III) Rh +. What is the most likely cause of immune conflict?
A. Rh conflict
B. Antigen Conflict A
C. Antigen Conflict B
D. AB antigen conflict
E. AB0 conflict
18. A 28-year-old woman in childbirth gave birth to a girl weighing 3,400 g, 52 cm long, with manifestations of anemia and progressive jaundice. Blood group in woman B (III) Rh−, in the father of the newborn - A (II) Rh +, in the newborn - B (III) Rh +. What is the cause of anemia?
A. Rh conflict
B. Antigen Conflict A
C. Antigen Conflict B
D. AB antigen conflict
E. Intrauterine infection
19. The firstborn has rhesus - a negative blood type, isoantibodies are not detected. Rhesus man is positive. At monthly control antibodies are not revealed. What should be the doctor's tactics?
A. Immunize a pregnant woman at 28 weeks of gestation and postpartum for 72 hours.
B. Do not desensitize or immunize.
C. Immunize after delivery for 72 hours.
D. To carry out desensitizing therapy, not to carry out immunization.
E. Desensitizing therapy and immunization for 72 hours after delivery.

20. Pregnant 26 years old, pregnancy II, 14-15 weeks. The first pregnancy ended in an abortion at 11-12 weeks. In women - O (I) Rh−, in men - O (I) Rh + blood group. What examinations should a woman have?

A. Coagulogram
B. Determination of group antibodies
C. Determination of anti-Rh antibodies
D. Biochemical analysis of blood
E. Cordocentesis

21. In a 22-year-old woman with Rh (-) negative blood, the man is Rh (+) positive. No antibodies to Rh were detected until 32 weeks. At 35 weeks of gestation, no antibodies to Rh were detected during retesting. What is the frequency of further determination of antibodies?
A. Once a month
B. Once every two weeks
C. Once every three weeks
D. Once a week
E. Further definition is impractical

22. On the second day of the child from physiological urgent childbirth appeared icteric skin and mucous membranes. Indirect bilirubin - 152 μmol / l. The mother has blood group O (I) Rh-, the child - A (II) Rh +. The mechanism of jaundice?
A.Intrauterine infection.
B. Impaired bile outflow.
C. Disorders of bilirubin metabolism.
D. Fetoplacental insufficiency.
E. Hemolysis of erythrocytes

23. The pregnant woman turned to the doctor of the women's consultation with complaints about the decrease in the motor activity of the fetus within 34-35 weeks. Ultrasound revealed: the placenta is thickened, 52 mm, granular, with calcinates, the head and torso of the fetus have a double contour, the diameter of the abdomen is increased, the motor activity of the fetus is sluggish, the fetal heart rate is 160-170 / min. Pregnant blood group 0 (I) Rh (-). Rh antibody titer 1: 128. What tactics?
A. Premature birth by cesarean section
B. Introduce 1 dose (300 μg) of anti-Rho (D) immunoglobulin
C. Carry out a skin graft from a man
D. Carry out infusion antihypoxic therapy for the fetus
E. Repeat ultrasound after 4 days

24. A 24-year-old woman at the age of 16 weeks applied for an appointment due to a history of reproductive losses (stillbirth, early infant death). The study was not

performed due to a burdensome history. In the phenotype of the pregnant woman pay attention: high growth, developed mammary glands. At cytogenetic research the karyotype of the woman - 45, X / 46, XX / 47, XXX. Ultrasound examination of the fetus revealed marker signs of chromosomal pathology. What are the tactics of managing a pregnant woman?
A. Abortion
B. Carrying out of ultrasound research of a fetus with the analysis of syndromes
C. Carrying out cytogenetic research of a man
D. Carrying out molecular cytogenetic research
E. Carrying out invasive methods of prenatal diagnosis (amniocentesis

25. In a re-pregnant woman with Rh-isosensitization revealed a decrease in the titer of Rh antigen from 1:32 to 1: 8 during pregnancy 33-34 weeks. Ultrasound revealed a double contour of the head, enlargement of the fetal liver, placental thickness of 50 mm. The patient is shown:
A. Premature birth
B. Conducting a course of desensitizing therapy
C. Plasmophoresis
D. Repeated (after 2 weeks) ultrasound examination
E. Introduction of anti-rhesus gamma globulin

Answers: 1- B; 2-C; 3- A; 4-D; 5- A; 6-E; 7-C; 8-E; 9- C; 10-B; 11-C; 12- E; 13—D; 14-A ;15- A ; 16-A; 17-A; 18- A; 19- A; 20- C; 21- D; 22- E; 23- A; 24- E; 25- A.

Situational tasks:

1. Secondipara, O (I), Rh - negative blood type at 36-37 weeks of gestation was hospitalized in the Department of Pathology of Pregnant Women. The titer of natural antibodies - 1: 256, immune antibodies - 1: 4, hemolysins - 1: 2. Ultrasound: hepatosplenomegaly, ascites, placental thickness 56 mm, polyhydramnios were detected in the fetus. What diagnosis is most likely, and what are the tactics of the patient?

The correct answer is isoantigenic incompatibility of maternal and fetal blood by Rh factor. Hemolytic disease of the fetus. Premature birth by cesarean section.

2. In a second gravida woman with Rh-isosensitization revealed a decrease in the titer of rhesus antibodies from 1:16 to 1: 8 at a gestational age of 25-26 weeks. Ultrasound revealed a double contour of the head, enlargement of the liver, thickening of the placenta to 50 mm. What are the next tactics?

The correct answer is to terminate the pregnancy

3. A pregnant woman with Rh-isosensitization (titer 1:16) was diagnosed with type I diabetes. What are the next tactics?

The correct answer is to terminate the pregnancy

4. Second gravida with 0 (I), Rh-positive blood at 36-37 weeks of gestation was hospitalized in the Department of Pathology of Pregnant Women. The titer of natural antibodies 1: 256, immune antibodies 1:64, hemolysins - 1: 2. At what time of gestation should the patient give birth?

The correct answer is urgent

5. Second gravida hospitalized in the pathology department of pregnant women at gestational age of 32-33 weeks. Blood group A (II), Rh-negative. History of two births with Rh-positive full-term fetuses. The antibody titer in this pregnancy is 1:16, does not increase. At what time of gestation is it necessary to give birth to a patient?

The correct answer is at 37-38 weeks

6. A first-pregnant woman with Rh-negative blood had a medical abortion at 10-11 weeks. What are the doctor's next tactics?

The correct answer is the introduction of anti Rh-immunoglobulin.

7. Rh-factor sensitization was detected in a second pregnant woman during registration in the woman’s consultation. The woman was diagnosed with chronic pyelonephritis, mild iron deficiency anemia. History of two blood transfusions, 2 miscarriages in early gestation. What is the most likely cause of Rh factor sensitization?

The correct answer is a blood transfusion without taking into account the Rh factor**.**

8. Prima gravida with Rh-negative blood at a gestational age of 40 weeks is in the second period of childbirth. When is it necessary to administer anti Rh immunoglobulin to prevent Rh-sensitization?

The correct answer is within 72 hours after delivery.

9. A mother with O (I), Rh-negative blood type and a father with A (II), Rh-positive blood type gave birth to a child with A (II) Rh-negative blood type with signs of hemolytic jaundice. What is the most likely cause of this condition?

The correct answer is a conflict according to the ABO system.

10. A full-term newborn developed moderate jaundice one day after birth. The mother is pregnant with O (I), Rh-negative blood type, the father with B (III), Rh-positive blood type. Coombs' direct test with umbilical cord blood is negative, the mother has no anti-rhesus antibodies. What is the diagnosis of a newborn?

The correct answer is hemolytic disease of the newborn according to the ABO system.

3. FORMATION OF PROFESSIONAL SKILLS (mastering skills, conducting curation, determining the treatment regimen, conducting a laboratory study, etc.).

3.1. Content of tasks (tasks, clinical situations, etc.).

Interactive task:

Students of the group are divided into 3 subgroups of 4-5 people each. We work in women's consultation rooms with gynecological patients, we give tasks:

And the I subgroup - to make a preliminary diagnosis.

Subgroup II - to make a plan for the management of a pregnant patient.

Subgroup III – to assess answers of subgroups I and II and makes adjustments.

3.2. Recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills, etc.)

Isoantigenic incompatibility of maternal and fetal blood

Isoimmunization – one of the clinical forms of immune pregnancy failure that arises conditional upon incompatibility of maternal and fetal organisms for different antigens and leads to severe disorders in the state of fetus and baby.

The main forms are:

- Rh- isoimmunization;
- AB0- isoimmunization.

Rh isoimmunization – humoral immune answer to fetus erythrocytal antigenes of Rh group. Antibodies (Ab) get through placenta and cause extravascular hemolysis and anemia conditioning erythroblastosis of fetus.

Risk factors:

- Artificial abortion in anamnesis;
- Spontaneous abortion in anamnesis;
- Rh-positive blood type transfusion in anamnesis;
- Ectopic pregnancy;
- Absence of specific prophylactics of Rh incompatibility after the end of previous pregnancy;
- Rh incompatibility during previous pregnancies.

Risk of isoimmunization is heightened by:

- Placental abruption;
- Surgery (manual removal of placenta, caesarean section, amniocentesis) in anamnesis or during existent pregnancy;
- Virus infection (herpes, cytomegalovirus).

AB0 incompatibility develops in conditions of incompatibility of maternal and fetal blood groups and presence of Ab to erythrocytes of fetal blood group. Group-specific Ab may be produced in maternal organism as an answer to hemotherapy, vaccines and therapeutic serums, contact with bacteria that contain A and B antigenic factors.

In most cases immune incompatibility happens when maternal blood type is 0(I) and fetal blood type is A(II), seldom B(III) or AB(IV). AB0 isoimmunization can be the cause of different forms of hemolytic disease (HD) of newborn from subclinical form to severe erythroblastosis and antenatal fetal death. Although whilst in AB0 incompatibility fetal erythrocytes are quickly destroyed in maternal organism and Ab synthesis doesn't catch so as a rule the form of the disease is mild.

It is wise to make AB0-specified Ab test in women with recurrent miscarriage or antenatal fetal death in anamnesis.

Ab0 incompatibility smoothes pregnancy course whilst in Rh incompatibility. Rh incompatibility arises more often if mother and fetus have the same or common blood types of AB0 system.

Diagnostics of immune conflict

Anamnesis: blood transfusion without regard to Rh group, abortions, stillbirth or babies with HD, data of specific prophylactics of isoimmunization during previous pregnancies.

Rh-Ab titre test: rise and instability of Rh-Ab titre indicates on Rh incompatibility. In titre 1:32 and higher HD arises more often, the risk of antenatal fetal death is high.

AB0-specific Ab test is performed in pregnant women with O(I) blood type that have spontaneous abortions, stillbirth, child death from HD in anamnesis.

Diagnostics of HD of fetus

Ultrasound examination allows to visualize symptoms of an early and fully developed hydrops fetalis.

Symptoms of an early stage of hydrops fetalis:

- polyhydramnion;
- hepatosplenomegaly.

Symptoms of a fully developed hydrops fetalis:

- growth of echogenicity of fetal intestines;

- cardiomegaly and pericardial effusion;
- ascites and hydrothorax;
- "Buddha" posture;
- motion activity deminussion;
- placenta thickening.

Ultrasonic scanning is carried out in pregnant women from the risk group for Rh incompatibility:

- before 30 weeks of pregnancy once a month;
- after 30 weeks of pregnancy twice a month;
- on appearance of fetal damage symptoms every day up to delivery.

Cardiotocography – symptoms of chronic hypoxia of fetus and decrease of compensatory ability of fetoplacental complex.

Transabdominal amniocentesis is carried out after 26 weeks of pregnancy.

A question of necessarity of amniocentesis is solved depending upon Ab titre and anamnesis data. If there are indications to amniocentesis a woman must be treated in the health care institution of the 3rd level.

Indications to amniocentesis:

- Ab titre 1:64 and higher;
- 4-fold titre growth in repeated test in 2 weeks;
- Ab titre growth and ultrasonic symptoms of HD of fetus;
- stillbirth, children with HD in anamnesis.

Contraindications:

- threatening premature birth;
- fever.

Amniotic fluid test allows to estimate fetal anemia severity.

In the case of development of fetal HD, rise of the concentration of bilirubin in amniotic fluid and growth of amniotic fluid optical density (AFOD) indicates severity level of the HD.

If AFOD is 0,1 or lower then pregnancy can be prolonged, if AFOD is 0,15 or over then delivery preparation should be started.

Amniotic Fluid Optic Density	Bilirubin concentration in amniotic fluid, mg/l	Fetus state
0,15 – 0,20	0 – 2,8	Risk of fetal HD development is low
0,21 – 0,34	2,9 – 4,6	Risk of fetal HD development is mild
0,35 – 0,70	4,7 – 9,5	Risk of fetal HD development is high

Over 0,70	Over 9,5	Risk of fetal HD development is extremely high

Cordocentesis – umbilical cord blood taking through anterior abdominal wall of a woman (is carried out at the health care institution of the 3rd level if there are trained specialists). In fetal blood we measure:

- hemoglobin and hematocrit;
- blood group and Rh-factor;
- bilirubin level;
- reticulocytes amount;
- serum protein;
- fetal erythrocytes-fixed Ab.

If fetal blood is Rh-negative further analysis are not necessary.

Postnatal diagnostics of hemolytic disease of newborn (HDN) – blood group, Rh-factor and bilirubin level, speed of hourly bilirubin level rise, Hb and Ht levels are measured in blood of umbilical cord vessels. Coombs direct test is carried out on peripheral blood of fetus.

Tactics of pregnancy care and delivery management

On the stage of antenatal clinic:

Rh-Ab titre is measured in blood on the first visit, in 20 weeks and later every 4 weeks.

If pregnant woman has 0(I) blood type we measure her husband's blood type and identify the risk group for newborn for AB0 incompatibility.

On the stage of maternity obstetric service:

Delivery in women with Rh-negative blood type with isoimmunization is carried out prematurely depending on blood Ab titre.

Indications to premature delivery in Rh-incompatibility:

- Ab titre 1:64 (critical level);
- 4-fold titre rise in repeated test;
- AFOD 0,35-0,70 and over, bilirubin level in amniotic fluid is 4,7-9,5 mg/l;
- ultrasonic symptoms of HD of fetus;
- stillbirth or babies with HD in anamnesis.

Straight after baby's birth umbilical cord is clamped to prevent of anti-Rh Ab getting into baby's bloodstream, placental end of umbilical cord is not clamped (to decrease the risk and volume of transfusion from mouther to child). In the case of caesarean section manual removal of placenta is not performed.

Prophylactics of Rh-immunization

Prophylactics during pregnancy without previous immunization of pregnant woman is carried out by intramuscular injection of 1 dose (300 mcg) of anti-Rh (D) immunoglobulin:

- at the term of pregnancy of 28-32 weeks;
- in case of symptoms of threatened spontaneous abortion before 28 weeks of pregnancy;
- after amniocentesis or chorion biopsy;
- after molar pregnancy removal;
- after ectopic pregnancy;
- after abortion (not later than in 48 hours);
- after mistaken transfusion of Rh-positive blood to Rh-negative woman;
- after platelet concentrate transfusion;
- in clinical situations that are accompanied by fetus cells arriving in maternal bloodstream;
- placenta abruption, uterine bleeding (of an unknown etiology);
- trauma of pregnant woman (e.g. car crash).

In pregnancy term less then 13 weeks dose of anti-Rh (D) immunoglobulin is 75 mcg, in pregnancy term over 13 weeks – 300 mcg.

Prophylactics after birth of Rh-positive baby: intramuscularly 1 dose (300 mcg) of anti-Rh (D) immunoglobulin during first 72 hours.

Contraindications to injection of anti-Rh (D) immunoglobulin – anamnesis data of anaphylactic or severe system reactions to human immunoglobulin.

Prophylactics of HD caused by AB0 incompatibility is not performed during pregnancy.

Unspecific drug prophylactics and treatment of Rh incompatibility is not performed in pregnant women.

Jaundice of the newborn – appearing of visible yellow tinction of skin, sclerae and/or mucosae as a result of bilirubin blood level rise in newborn.

- **Early jaundice –** appears during the first 36 hours after birth. Jaundice that appeared during the first 24 hours after birth is always a symptom of pathology.
- **"Physiological" jaundice –** appears after the first 36 hours after birth and is characterized by total bilirubin level rise in blood serum not more then up to 205 mmol/l.
- **Complicated "physiological" jaundice–** physiological jaundice that is accompanied by changes in a state of newborn.
- **Prolonged (protracted) jaundice –** is diagnosed after the 14^{th} day in mature newborns and after the 21^{th} day in premature newborns.
- **Late jaundice –** appears after the 7^{th} day of newborn's life.

Methodics of clinical examination and staging of jaundice

Skin colour: check for yellow discoloration of skin should be held on a fully naked baby in condition of sufficient (optionally daylight) illumination.

Yellow skin tinction spread: It is wise to use modified Kramer's scale for estimation of jaundice appear stages and correlation with bilirubin blood level. An alternative to the visual estimation with Kramer's scale can be bilirubin skin level analysis with percutaneous bilirubinometry.

Time of jaundice appear:

Child age (hours)	Jaundice localization	Conclusion
24	Any	
24-48	Extremities	"dangerous jaundice"
>48	Foots, arms	

Immediate phototherapy should be started after symptoms appearing of a "dangerous jaundice".

Clinical state of a newborn

- **Clinical state of newborn should be estimated on appearance of jaundice:**
  - Grade of child adequacy, reflex activity.
  - Adequacy of breast feeding that should take place not less than 8 times a day.
  - Skin turgor state and mucosae wetness
  - Liver and spleen sizes.
  - Miction rate and urine character.
- It is extremely important to check newborns with jaundice for symptoms of central neural system disorders (kernicterus):
  - Early symptoms – appearance of lethargy, drowsiness, torpidity and sucking reflex repression.
  - Acrimony, muscular hypertonia, high sound scream, possible temperature rise at a later period.
  - At terminal stage child develops opisthotonus, convulsions, apnea, monotonous high-pitch cry, deep stupor or coma.

3.3. Requirements for the results of work.

- to give an advice for pregnant woman with Rh negative blood.
- to evaluate the patient.
- to make a management of pregnancy course and postpartum period for women's with O(I) and Rh neative blood .

- to write the clinical diagnosis in pregnant women with Rh - incompatibility of mother and fetus;
- to write a plan of survey pregnant with Rh-negative blood type;
- to write tactics pregnant withRh – and ABO incompatibility of blood between mother and fetus;
- to make an oral report on the thematic patient.
- to do analysis and discussion of the results of the patient's examination.
- to do multimedia presentation on the topic of the lesson (review of literature using modern sources; videos, etc.).

3.4. Control materials for the final stage of the class: tasks, tests, etc.

Situational task:

1. Second- Gravida with blood type O (I) Rh - negative at term 36-37 weeks of gestation was hospitalized. Natural antibodies titer - 1: 256, immune antibodies - 1: 4, hemolysin - 1: 2. Ultrasound results: fetal revealed hepatosplenomegaly, ascites, placental thickness of 56 mm, polyhydramnios.
What is the most likely diagnosis and what tactics?
Correct answer – Rh-incompatibility between the blood of mother and fetus in Rh-factor. Hemolytic disease of the fetus. Early delivery by Caesarean section.

2. Pregnant with Rh-iincompatibility has a reduction in titer Rh antibodies from 1:16 to 1: 8 at term gestation 25-26 weeks. With ultrasound revealed the outline of the head, liver enlargement, thickening of the placenta to 50 mm. What subsequent tactic?
Correct answer - abortion

3. In pregnant women with Rh-iincompatibility (titer 1:16) discovered type I diabetes. What subsequent tactic?
Correct answer - abortion

4. Multigravida with 0 (I), Rh- positive blood was admitted to hospital at 36-37 weeks gestation . Natural antibody titer of 1: 256, 1:64 immune antibodies, hemolyzyny - 1: 2. In what term of gestation should be taken labor?
Correct answer - immediately

5. Multigravida was hospitalized in the department of pathology of pregnancy at term gestation 32-33 weeks. Blood group A (II), Rh-negative. In the history She gave a birth to 2 Rh-positive mature babies. Antibody titers during this pregnancy 1:16, not increased. In what gestation period is necessary to gently delivery patient?
The correct answer – at 37-38 weeks

6. Primagravida with Rh-negative blood affiliation made medical abortion at 10-11 weeks of term. What subsequent tactic of doctor?
The correct answer - the prescribtion of Anti-Rh immunoglobulin.

7. In Multigravida during registration in Women's consultatition detected sensitization by Rh-factor. The woman discovered chronic pyelonephritis, iron deficiency anemia mild. In the history of two hemotranfuziyi 2 mymovylnyh abortion in early nd habitats. What is the most probable cause sensitization by Rh-factor?

The correct answer is - without blood transfusion Rh-factor.

8. Primagrvida with Rh-negative blood at term gestation of 40 weeks nahodytsya in the second stage of labor. When you need to enter Antirhesus Rh-immunoglobulin to prevent Rh-sensitization?

Correct answer - to train the first 72 hours after birth.

9. The mother of O (I), Rh-negative blood type and the father of A (II), Rh-positive blood type baby with A (II) Rh-negative blood type with signs of hemolytic jaundice. What is the most likely cause of this condition?

Correct answer is conflict ABO system.

10. In newborn baby one day after birth developed mild jaundice. Mother is Primapara with O (I), Rh-negative blood type, the father has B (III), Rh-positive blood type. The direct Coombs test of umbilical cord blood is negative, no antirhesus maternal antibodies. What is the diagnosis in a newborn?

Correct answer - hemolytic disease of the newborn ABO system.

4. SUMMING UP

Assessment of the ongoing learning activity at the practical class:

1. Assessment of the theoretical knowledge on the theme:
   - methods: individual survey on the theme, participation of the students in the discussion of problem situations; assessment of performance of tests on the theme;
   - the maximum score – 5, the minimum score – 3, the unsatisfactory score – 2.
2. Assessment of practical skills on the theme:
   - methods: assessment of the solution of situational tasks (including calculation) on the theme;
   - the maximum score – 5, the minimum score – 3, the unsatisfactory score – 2.

Assessment of the individual task:

1. Assessment of the quality of the performance of the individual task:
   - the maximum score – 5, the minimum score – 3, the unsatisfactory score – 2.
2. Assessment of the presentation and defense of an individual task, participation in the assessment of the business plan of the competitors and its critical analysis:
   - the maximum score – 5, the minimum score – 3, the unsatisfactory score – 2.

The score for one practical class is the arithmetic average of all components and can only have an integer value (5, 4, 3, 2), which is rounded statistically.

Criteria for ongoing assessment at the practical class:

"5"	The student is fluent in the material, takes an active part in the discussion and solution of situational clinical problems, confidently demonstrates practical skills during the examination of a pregnant and interpretation of clinical, laboratory and instrumental studies, expresses his opinion on the topic, demonstrates clinical thinking.
"4"	The student is well versed in the material, participates in the discussion and solution of situational clinical problems, demonstrates practical skills during the examination of a pregnant and interpretation of clinical, laboratory and instrumental studies with some errors, expresses his opinion on the topic, demonstrates clinical thinking.
"3"	The student isn't well versed in material, insecurely participates in the discussion and solution of a situational clinical problem, demonstrates practical skills during the examination of a pregnant and interpretation of clinical, laboratory and instrumental studies with significant errors.
"2"	The student isn't versed in material at all, does not participate in the discussion and solution of the situational clinical problem, does not demonstrate practical skills during the examination of a pregnant and the interpretation of clinical, laboratory and instrumental studies.

RECOMMENDED LITERATURE

Basic:

1. Gladchuk I.Z. Obstetrics: student`s book / Gladchuk I.Z., Ancheva I.A. . – Vinnitsia: Nova Knyha, 2021. – 288 p.
2. Obstetrics and Gynecology: in 2 volumes. Volume 1. Obstetrics: textbook / V.I. Gryshchenko, M.O. Shcherbina, B.M. Ventskivskyi et al. (2nd edition). – «Medicina», 2018. – 392 p.
3. Hiralal Konar DC Dutta's Textbook of Obstetrics (9th Ed.) / Hiralal Konar (Ed.). – Jp Medical Ltd, 2018. – 700 p.
4. F. Gary Cunningham Williams Obstetrics (26th Edition) / F. Gary Cunningham, Kenneth Leveno, Jodi Dashe, Barbara Hoffman, Catherine Spong, Brian Casey. – McGraw Hill / Medical, 2022. – 1328 p.
5. Jeremy Oats, Suzanne Abraham Llewellyn-Jones Fundamentals of Obstetrics and Gynaecology (10th Ed) / Jeremy Oats, Suzanne Abraham. – Elsevier, 2016. – 384 p.

Additional:

1. The PROMPT-CIPP Editorial Team. (2019). PROMPT-CIPP Course Participant's Handbook: Care of the Critically Ill Pregnant or Postpartum Woman (Critical Car Prompt Practical Obstetric Multi-professional Training). – Cambridge University Press; 1st edition, 2019. – 136 p.
2. L. A. Magee The FIGO Textbook of Pregnancy Hypertension. An evidence-based guide to monitoring, prevention and management. / L. A. Magee, P. Dadelszen, W. Stones, M. Mathai (Eds). – The Global Library of Women's Medicine, 2016. – 456 p.
3. Edwin Chandraharan Handbook of CTG Interpretation: From Patterns to Physiology / Edwin Chandraharan. – Cambridge University Press; 1st edition, 2017. – 256 p.
4. Louise C. Kenny, Jenny E. Myers Obstetrics by Ten Teachers (20th ed) / Louise C. Kenny, Jenny E. Myers. – CRC Press, 2017. – 342 p.
5. J. Studd Current Progress in Obstetrics and Gynaecology. Vol 4. / J. Studd, Seang Lin Tan, F. Chervenak. – TreeLife Media (A Div of Kothari Medical), 2017. – 419 p.
6. J. Studd Current Progress in Obstetrics and Gynaecology. Vol 5. / J. Studd, Seang Lin Tan, F. Chervenak. – TreeLife Media (A Div of Kothari Medical), 2019. – 403 p.
7. J. Studd Current Progress in Obstetrics and Gynaecology. Vol 6. / J. Studd, Seang Lin Tan, F. Chervenak. – TreeLife Media (A Div of Kothari Medical), 2022. – 309 p.
8. Mark Landon Obstetrics: Normal and Problem Pregnancies, 8th Edition / Mark Landon, Henry Galan, Eric Jauniaux, Deborah Driscoll, Vincenzo Berghella, William Grobman, et al. – Elsevier, 2021. – 1280 pp.
9. Mark B. Landon Gabbe's Obstetrics Essentials: Normal & Problem Pregnancies, 1st Edition / Mark B. Landon, Deborah A. Driscoll, Eric R. M. Jauniaux, Henry L. Galan, William A. Grobman, Vincenzo Berghella. – Elsevier, 2019. – 496 pp.
10. Ian M. Symonds, Sabaratnam Arulkumaran Essential Obstetrics and Gynaecology, 6th Edition / Ian M. Symonds, Sabaratnam Arulkumaran. – Elsevier, 2020. – 480 pp.
11. Myra J. Wick Mayo Clinic Guide to a Healthy Pregnancy, 2nd Edition / Myra J. Wick. – Mayo Clinic Press, 2018. – 520 p.

INTERNET SOURCES:

- https://www.cochrane.org/
- https://www.ebcog.org/
- https://www.acog.org/
- https://www.uptodate.com

- https://online.lexi.com/
- https://www.ncbi.nlm.nih.gov/
- https://pubmed.ncbi.nlm.nih.gov/
- https://www.thelancet.com/
- https://www.rcog.org.uk/
- https://www.npwh.org/