

**RISK FACTORS OF RH-ISOSENSITIZATION IN PREGNANT WOMEN
WITH RH-NEGATIVE BLOOD IN THE CONDITIONS OF THE BAKU CITY**

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Thirteen pregnant women with Rh isosensitization were examined. Based on somatic and obstetric anamnesis data, risk factors for the development of Rh isosensitization were identified. The average age of the women was 30.3 ± 14.16 years. The sexual life of the examined women began at the age of 23.26 ± 2.5 (17–18) years. The study of obstetric history revealed that the total number of pregnancies was 4.0 ± 2.2 (1–10), childbirth 2.2 ± 0.9 (1–4), abortion 2.0 ± 1.7 (1–5), and the total number of children was 1.1 ± 0.3 (1–2). It was established that the risk factors for the isosensitization development in pregnant women with Rh-negative blood are the absence of immunoprophylaxis after previous childbirth in 92.3 % of pregnant women, the lack of immunoprophylaxis after an interrupted pregnancy in 84.6 %, the presence of antenatal fetal death in an obstetric history in 53.8 %, 46.2 % had a premature detachment of a typically located placenta during a previous pregnancy, 46.2 % of pregnant women had bleeding in the first pregnancy trimester, 30.8 % of pregnant women had a history of induced abortions, 15.4 % had a history of spontaneous miscarriages, 15.4 % incorrect definition of Rh belonging.

Risk factors for the isosensitization development in the conditions of the Baku city are lack of immunoprophylaxis after previous childbirths (92.3 %), abortion (84.6 %), a history of antenatal fetal death (53.8 %), premature detachment of a typically located placenta (46.2 %), bleeding in the first trimester of pregnancy (46.2 %), a history of artificial termination of pregnancy (30.8 %), a history of spontaneous miscarriage (15.4 %), incorrect determination of Rh affiliation (15.4 %). Conducting timely anti-D immunoprophylaxis in pregnant women with a high risk factor for isosensitization and the development of fetal hemolytic disease significantly reduces perinatal morbidity and mortality from hemolytic disease of the fetus and newborn.

Key words: isosensitization, Rh isoimmunization, anti-D immunoprophylaxis.

Relationship of the publication with planned research works. This work is a fragment of an ongoing dissertation for the degree of Doctor of Philosophy in Medicine «Modern diagnostic methods of immunological conflict during pregnancy and the effectiveness of intrauterine blood transfusion in rhesus isoimmunization».

Introduction. The development of immune conflict (isosensitization, isoimmunization) in women with Rh-negative blood is an urgent problem of modern obstetrics. There are various causes and features of the clinical course in rhesus mismatch of maternal and fetal blood.

According to I.V. Mitra [1], one of the factors of Rh sensitization in pregnant women with Rh-negative blood is the transfusion of Rh-positive donor blood. The frequency of sensitization of this contingent of pregnant women is 2.9 %.

According to the conducted studies, the cause of Rh immunization in pregnant women with Rh-negative blood is acute fetoplacental insufficiency. The presence of spontaneous abortion during pregnancy, antenatal fetal death, premature detachment of a normally located placenta, various medications, obstetric interventions, hemotransfusion for various indications, the presence of blood group 0 (I) significantly increases the likelihood of isosensitization [2, 3, 4].

The conducted scientific studies have made it possible to establish that during in vitro fertilization, the need for screening genetic diseases in Rh-negative women, as well as conducting genetic studies in the preimplantation period, is a high risk factor for alloimmunization.

The term isoimmunization is synonymous with the term Rh immunization, Rh conflict, Rh sensitization, alloimmunization.

According to various studies, the frequency of Rh immunization between Rh-negative maternal blood and Rh-positive fetal blood is 10–13 % [5, 6, 7].

It has been established that the state of health of pregnant women is affected by a variety of factors, one of which is the state of the immune system. According to S.G. Tsakhilov et al. [5] it was found that the state of the mother's immune system significantly affects the intrauterine development of the fetus and the state of the fetoplacental system. It has been established that Rh immunization between mother and fetus occurs as a result of the presence of D-antigen.

It should be noted that the presence of C, c, E, e antigens also determines isoimmunization. Sensitization of pregnant women with Rh-negative blood occurs when the fetus has D antigen inherited from the father, or when transfusing Rh-positive donor blood [8, 9, 10]. It was found that the presence of a transplacental hematoma also accelerates the development of isosensitization [10].

Isoimmunization of pregnant women with Rh-negative blood leads to the development of various forms of fetal hemolytic disease, which justifies the study of risk factors and the frequency of their occurrence.

According to N.G. Pavlov et al., [11] isoimmunization risk factors are:

– repeated pregnancy, repeated childbirth, the presence of spontaneous miscarriages and the absence of immunoglobulin prevention;

- a history of severe hemolytic disease of the fetus and newborn;
- the presence of ante-, intra- and postnatal fetal death in a pregnant woman;
- the presence of an ectopic pregnancy in the anamnesis and the absence of immunoprophylaxis;
- the presence of a history of donor blood transfusion in pregnant women, without first examining the group and Rh factor of donor blood in the pregnant woman.

According to other authors, risk factors for the development of isoimmunization include:

- the presence of obstetric, extragenital pathology, increasing the permeability of the placental barrier;
- the presence of bloody discharge in pregnant women and the threat of spontaneous miscarriage.

The use of invasive procedures during pregnancy includes chorionic biopsy, cordocentesis, transplacental amniocentesis [1, 10, 11].

According to G.N. Savelyeva [12], risk factors for the development of Rh isoimmunization are:

- transfusion of donor blood to women with Rh-negative blood, without first examining the Rh affiliation;
- the presence of childbirth, medical abortions, ectopic pregnancy in women with Rh-negative blood;
- conducting invasive diagnostics and therapeutic methods, including chorion biopsy, amniocentesis, cordocentesis, circulation, embryo reduction in multiple pregnancies, obstetric rotation of the fetus on the head during pelvic presentation;
- the presence of bleeding during pregnancy;
- the presence of antenatal fetal death during a real pregnancy;
- the presence of abdominal trauma during pregnancy.

It should be noted that in the conditions of the city of Baku, there is practically no information about risk factors and the frequency of their occurrence in pregnant women with Rh-negative blood.

The aim of the study was to study risk factors and the frequency of their occurrence in pregnant women with Rh-negative blood in the conditions of the city of Baku.

Object and methods of research. Based on the purpose of this study, 77 pregnant women with Rh-negative blood were examined. Of these, 13 (16.9 %) have clinical, functional, laboratory manifestations of isosensitization.

The study of the anamnesis of pregnant women with Rh isosensitization allowed us to establish that their average age was 30.4 ± 4.16 and ranged from 25–41 years. The sexual life of the examined women began at 23.26 ± 2.5 (17–18) years. The study of obstetric history revealed that the total number of pregnancies was 4.0 ± 2.2 (1–10), births 2.2 ± 0.9 (1–4), abortions 2.0 ± 1.7 (1–5), the total number of children at home 1.1 ± 0.3 [1–2].

The obtained results of the study were subjected to statistical processing. At the same time, a computer program «Statgraph» was used, designed for statistical data processing in a parametric and nonparametric way.

This study was conducted on the basis of the Educational and Surgical Clinic of the Azerbaijan Medical University. Written informed consent was obtained from all patients who participated in the study.

The results of the study and their discussion. As a result of the study, risk factors and the frequency of their occurrence in pregnant women with Rh isosensitization were established. The results obtained are presented in the **table**.

Table – Risk factors and the frequency of their occurrence in Rh sensitization of pregnant women with Rh-negative blood

Risk factors	Abs.	%
Artificial abortion	4	8
Spontaneous miscarriage	2	4
Antenatal fetal death	7	14
Premature detachment of a normally located placenta during a previous pregnancy	6	12
Lack of anti-D immunoprophylaxis after previous births	12	24
The presence of bleeding in the first trimester of a previous pregnancy	6	12
Absence of anti-D immunoprophylaxis after termination of pregnancy	11	22
Incorrect determination of Rh belonging to a pregnant woman	2	4

As can be seen from the **table**, the study of risk factors for rhesus isosensitization allowed us to establish a high frequency of the absence of anti-D immunoprophylaxis after previous childbirth (24 %), the absence of anti-D immunoprophylaxis after an aborted pregnancy (22 %), the presence of a history of antenatal fetal death (14 %), the presence of partial premature detachment of a normally located placenta in the previous pregnancy (12 %), the presence of bleeding in the first trimester of previous pregnancy (12 %), the presence of artificial termination of pregnancy (8 %), spontaneous miscarriage (4 %), incorrect definition of Rh belonging to a woman (4 %).

As a result of the study, it was found that out of 13 pregnant women with rhesus isosensitization, 12 (92.3 %) had no anti-D immunoprophylaxis after childbirth, 11 (84.6 %) pregnant women had no anti-D immunoprophylaxis after termination of pregnancy, 7 (53.8 %) had a history of antenatal fetal death, 6 (46.2 %) partial premature detachment of a normally located placenta during termination of pregnancy, 6 (46.2 %) had bleeding in the first trimester of previous pregnancy, 4 (30.8 %) had a history of medical abortion, 2 (15.4 %) have a history of spontaneous miscarriage, 2 (15.4 %) have an incorrect definition of Rh affiliation.

Thus, risk factors for the development of Rh-isosensitization in pregnant women with Rh-negative blood are 92.3 % of pregnant women without immunoprophylaxis after previous childbirth, 84.6 % after termination of pregnancy, 53.8 % have a history of antenatal fetal death, 46.2 % have premature detachment of a normally located placenta during a previous pregnancy, 46.2 % have bleeding in the I in the trimester of pregnancy, 30.8 % had a medical abortion, 15.4 % had a spontaneous miscarriage in the anamnesis, 15.4 % had an incorrect determination of Rh affiliation.

It has been established that the determination of risk factors and the frequency of their occurrence make it possible to carry out timely anti-D immunoprophylaxis in pregnant women with Rh-negative blood, which will significantly reduce the indicators of hemolytic disease of the fetus and newborn.

Conclusions. 1. Risk factors for the development of isosensitization in the conditions of Baku are: lack of

immunoprophylaxis after previous childbirth (92.3 %), termination of pregnancy (84.6 %), the presence of antenatal fetal death in the anamnesis (53.8 %), premature detachment of the normally located placenta (46.2 %), the presence of bleeding in the first trimester of pregnancy (46.2 %), the presence of an artificial termination of pregnancy in the anamnesis (30.8 %), spontaneous miscarriage in the anamnesis (15.4 %), incorrect determination of Rh affiliation (15.4 %).

2. Timely anti-D immunoprophylaxis in pregnant women with a high risk factor for isosensitization and the development of hemolytic disease of the fetus, significantly reduces the indicators of perinatal morbidity and mortality from hemolytic disease of the fetus and newborn.

Prospects for further research. This study involves further research on the timely diagnosis of fetal hemolytic disease and the need for intrauterine hemotransfusion.

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ФАКТОРИ РИЗИКУ РЕЗУС ІЗОСЕНСІБІЛІЗАЦІЇ У ВАГІТНИХ З РЕЗУС НЕГАТИВНОЮ КРОВ'Ю В УМОВАХ МІСТА БАКУ

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Резюме. Метою дослідження було визначити фактори ризику та частоту виникнення ізосенсибілізації у жінок з резус негативною кров'ю. Було обстежено 13 вагітних з резус ізосенсибілізацією. На основі даних соматичного та акушерського анамнезу було визначено фактори ризику розвитку резус ізосенсибілізації. Середній вік досліджуваних складав $30,3 \pm 14,16$ років і був в межах від 25 до 41 року. Статеве життя досліджуваних жінок почалося з $23,26 \pm 2,5$ (17–18) років. Дослідження акушерського анамнезу показало, що загальна кількість вагітностей становила $4,0 \pm 2,2$ (1–10), пологів $2,2 \pm 0,9$ (1–4), абортів $2,0 \pm 1,7$ (1–5), загальна кількість дітей вдома $1,1 \pm 0,3$ (1–2).

Було встановлено, що факторами ризику розвитку ізосенсибілізації у вагітних з резус негативною кров'ю є у 92,3 % вагітних відсутність імунопрофілактики після попередніх пологів, у 84,6 % відсутність імунопрофілактики після перерваної вагітності, у 46,2 % наявність передчасного відшарування нормально розташованої плаценти при попередній вагітності, у 46,2 % вагітних кровотеча в I триместрі вагітності, у 30,8 % вагітних в анамнезі штучні аборти, у 15,4 % наявність в анамнезі спонтанних викиднів, у 15,4 % невірне визначення резус належності.

Було зроблено такі висновки:

1. Факторами ризику виникнення ізосенсибілізації в умовах міста Баку є: відсутність імунопрофілактики після перших пологів (92,3 %), переривання вагітності (84,6 %), наявність антенальної загибелі плоду в анамнезі

(53,8 %), передчасне відшарування нормально розташованої плаценти (46,2 %), наявність кровотеч в першому триметрі вагітності (46,2 %), наявність штучного переривання вагітності в анамнезі (30,8 %), спонтанний викидень в анамнезі (15,4 %), невірно визначена резус належність крові (15,4 %).

2. Проведення своєчасної анти-Д імунпрофілактики у вагітних з факторами високого ризику ізосенсибілізації і розвитку гемолітичної хвороби плоду суттєво зменшує показники перинатальної захворюваності і смертності від гемолітичної хвороби плоду та новонародженого.

Ключові слова: ізосенсибілізація, анти-Д імунпрофілактика, резус ізомунізація.

RISK FACTORS OF RH-ISOSENSITIZATION IN PREGNANT WOMEN WITH RH-NEGATIVE BLOOD IN THE CONDITIONS OF THE BAKU CITY

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Abstract. *Goal of the study.* To study the risk factors and incidence of Rh isosensitization in women with Rh negative blood. *Material and methods.* 13 pregnant women with Rh isosensitization were examined. Based on the data of somatic and obstetric anamnesis, risk factors for the development of Rh isosensitization were identified. The average age of the examined was 30.3±14.16 years, and ranged from 25–41 years. The onset of sexual life of the patients was at the age of 23.26±2.5 (17–18) years. The study of obstetric history revealed that the total number of pregnancies was 4.0±2.2 (1–10), childbirth 2.2±0.9 (1–4), abortion 2.0±1.7 (1–5), the total number of children at home is 1.1±0.3 (1–2).

Results. It was established that the risk factors for the development of isosensitization in pregnant women with Rh negative blood are the absence of immunoprophylaxis after previous births in 92.3 % of pregnant women, the absence of immunoprophylaxis after an interrupted pregnancy in 84.6 %, the presence of antenatal fetal death in an obstetric history in 53.8 % of cases, 46.2 % of examined had premature detachment of a normally located placenta during a previous pregnancy, 46.2 % of pregnant women had first trimester hemorrhage, 30.8 % of pregnant women had a history of induced abortions, 15.4 % had a history of spontaneous miscarriages and 15.4 % incorrect diagnosis of Rh affiliation.

Conclusions.

1. The risk factors for the development of isosensitization in the conditions of the city of Baku are: lack of immunoprophylaxis after previous births (92.3 %), abortion (84.6 %), a history of antenatal fetal death (53,8 %), premature detachment of a normally located placenta (46.2 %), bleeding in the first trimester of pregnancy (46.2 %), a history of surgical abortion (30.8 %), a history of spontaneous miscarriage (15.4 %), incorrect determination of Rh affiliation (15.4 %).

2. Timely anti-D immunoprophylaxis in pregnant women with a high risk factor for isosensitization and the development of hemolytic disease of the fetus significantly decreases the rates of perinatal morbidity and mortality from hemolytic disease of the fetus and newborn.

Key words: isosensitization, anti-D immunoprophylaxis, Rh isoimmunization.

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