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ABSTRACT

Of the dissertation for the degree of Doctor of Philosophy

**CORRECTION OF THE ANTIOXIDANT DEFENSE SYSTEM
DURING INTENSIVE TREATMENT OF PREGNANT
WOMEN WITH PREECLAMPSIA ACCOMPANIED WITH
ANEMIA**

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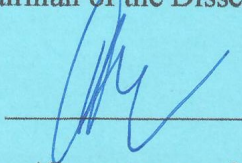
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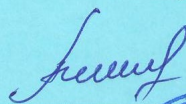
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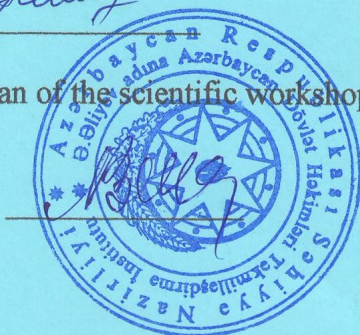
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GENERAL CHARACTERISTICS OF THE RESEARCH WORK

Relevance and development rate of the topic. Preeclampsia is one of the most common complications of pregnancy and plays a key role in the structure of maternal mortality, as well as perinatal morbidity and losses [Аккер Л.В., Варшавский Б.Я., Ельчанинова С.А., Нагайцев В.М., и др. 2000¹; Zeynalova İ.X., 2007²; Qədirov A.V., İsrafilbəyli S.H., Əkbərbəyova S.Ə., 2008³]. That is why, this pathology remains at the focus of modern obstetrics from the scientific-theoretical and practical point of view [Абрамченко В.В. 2001⁴; Qədirov A.V., İsrafilbəyli S.H., Əkbərbəyova S.Ə., Babayeva A.X., 2009⁵]. Acute forms of this complication cause increase in the number of neonatal morbidity and mortality [Əkbərbəyova S.Ə., 2012⁶].

Another most prevailed pathology during pregnancy is anemia. Acute forms of this pathology affects the childbirth and post-childbirth periods, posing a high risk to the mother as well as the fetus. The analysis of maternity mortality showed that independently from the reasons, in 2/3 of cases of childbirth and post-childbirth ended withleth

¹ Аккер Л.В., Варшавский Б.Я., Ельчанинова С.А., Нагайцев В.М., Чекрый О.В., Кореньяк Н.А. Показатели оксидантного и антиоксидантного статуса у беременных с гестозом. Акушерство и гинекология 2000; 4: 17-20

² Zeynalova İ.X. Hestozlarda fetoplasentar çatmamazlığın müasir metodlarla korreksiyası: Tibb elm.namiz. ... dis. Bakı. 2007, 192 s.

³ Qədirov A.V., İsrafilbəyli S.H., Əkbərbəyova S.Ə. Yüngül dərəcəli hestozlar zamanı uşaqliq arteriyalarında qan cərgəyanının vəziyyəti / Sağlamlıq, Bakı, 2008, №10, s. 63-67.

⁴ Абрамченко В.В. Антиоксиданты и антигипоксанты в акушерстве (оксидативный стресс в акушерстве и его терапия антиоксидантами и антигипоксантами)-СПб.: Изд-во ДЕАН, 2001.-400 с.

⁵ Qədirov A.V., İsrafilbəyli S.H., Əkbərbəyova S.Ə., Babayeva A.X. Hamiləlik hestozlarının müxtəlif ağırlıq dərəcələrində anemiyanın rastgəlmə tezliyi / Azərbaycan Təbabətinin müasir nailiyyətləri. Bakı, 2009, №6, s.176-180.

⁶ Əkbərbəyova S.Ə. Hamiləlik hestozları zamanı böyrəklərin və çiftin perfuziyasının pozulmaları və onların korreksiya yolları: Tibb elm. namiz. ... dis. Bakı. 2012, 196 s.

lityanemia has been observed [Məhərrəmova G.G. 1983⁷, Qədirov A.V., İsrafilbəyli S.H., Əkbərbəyova S.Ə., Babayeva A.X., 2009⁵].

It also should be noted that, preeclampsia often develops against the background of iron deficiency anemia (IDA) [Zeynalova İ.X., 2007⁸; Qədirov A.V., İsrafilbəyli S.H., Əkbərbəyova S.Ə., Babayeva A.X., 2009⁵]. The prevalence rate of such combination reached 40%. Etiology and pathogenesis of preeclampsia and IDA have some common features; also their combination often causes complications during pregnancy, worsens the consequences of childbirth for mother and fetus. Many authors point out that, preeclampsia occurs as a result of a violation of the adaptation of the female body to pregnancy; anemia in pregnant women is often associated with iron deficiency.

According to different sources the frequency of anemia changes between 15% and 80%. There fore, it can be considered that, in case of anemia (or against the background) the problem of development of preeclampsia remains more relevant.

It should be noted that, as pregnancy progresses, stress in the body's antioxidant defense system manifests itself clinically in changes in the peripheral circulation and hemodynamic systems. It has been found that iron supplements and blood transfusions used for therapeutic purposes also have a significant effect on the body's AODS (Antioxidant Defense System).

According to the modern ideas, the mechanism of maladaptation is due to disturbances in the balance of LOP (peroxidation of lipids) –AODS (Antioxidant Defense System). So that, in comparison with healthy pregnant women during the pregnancy complicated with preeclampsia intensification of peroxidation of lipids

⁷ Məhərrəmova G.G. Hamiləliyin ikinci yarısının toksikozları zamanı arterial qanın oksigenlə doyması // Azərb. Tibb Jurnalı, 1983, №5, s. 56-57.

⁸ Zeynalova İ.X. Hestozlarda fetoplasentar çatmamazlığın müasir metodlarla korreksiyası: Tibb elm.namiz. ... dis. Bakı. 2007, 192 s.

against the background of variability in different rings of antioxidant defense system was detected [Qədirov A.V., İsrafilbəyli S.H., Əkbərbəyova S.Ə., Babayeva A.X., 2009⁵, Qədirov A.V., Sadiqov R., Quliyeva L., Məmmədova L., Hüseynova G., 2009⁹].

According to medical literature in the third trimester of pregnancy in comparison with physiological pregnancies, the concentration of vitamin-antioxidants in women is very low. On the other hand, it was found that the amount of α -tocopherol-acetate, retinol, β -carotene decreases in pregnant women with IDA [Аврүцкая В.В., 2007¹⁰; Qədirov A.V., Sadiqov R., Quliyeva L., Məmmədova L., Hüseynova G., 2009⁹]. It is known that retinol, α -tocopherol-acetate, β -carotene are exogenous bioantioxidants. They have great importance for the normal functioning of AODS [Qədirov A.V., İsrafilbəyli S.H., Əkbərbəyova S.Ə., 2008³, Qədirov A.V., İsrafilbəyli S.H., Əkbərbəyova S.Ə., Babayeva A.X., 2009⁵].

It is likely that the combination of preeclampsia and anemia in pregnant women deepens the disorders of vitamin metabolism, and as the result of LOP-AODS imbalance deepens pathological morphological and metabolic changes in organs and systems, complicates the course of pregnancy and adversely affects the results. Thus, the treatment of anemia in pregnant women with preeclampsia is one of the most pressing issues.

It is written in medical literature that, in the II and III trimester of physiological pregnancy serum concentration of vitamin antioxidants is 1.5-2 times higher in comparison with non-pregnant women. Such a level is necessary not only for the adequate supply of the fetus and the active press of the mother's body, but also for the maintenance of a stable balance between LOP-AODS [Qədirov A.V., İsrafilbəyli S.H., Əkbərbəyova S.Ə., 2008³, Qədirov A.V.,

⁹ Qədirov A.V., Sadiqov R., Quliyeva L., Məmmədova L., Hüseynova G. Ağır preeklampsiya və eklampsianın reanimasiyası üzrə kliniki protokol. İctimai Səhiyyə və İslahatlar Mərkəzi. Bakı, 2009, 48 s.

¹⁰ Аврүцкая В.В. Изменения эндотелиальной системы сосудов беременных при гестозе / В.В. Аврүцкая, В.И. Орлов, А.Ю. Пономарева и др. // Российский вестник акушера-гинеколога .- 2007. - Т.7. - №1. - С. 4-6.

İsrafilbəyli S.H., Əkbərbəyova S.Ə., Babayeva A.X., 2009⁵]. In pregnant women with preeclampsia antioxidant levels are lower than normal and as a result of the intensification of LOP, the concentration of these antioxidants decreases according to the severity of the pathological process [Абрамченко В.В., 2001¹¹].

Thus, in pregnant women who develop severe preeclampsia accompanied by anemia, there are deep deficiencies in the body's antioxidant system, which creates unfavorable conditions for the normal course of pregnancy, and does not pass without affecting the health of the mother and fetus.

Thus, in pregnant women with developed severe preeclampsia accompanied by anemia, there are deep deficiencies in the body's antioxidant system, unfavorable conditions for the normal course of pregnancy, which does not pass unnoticed to the health of the mother and fetus.

Object and subject of the research work: In 122 women at the 33rd-35th weeks of gestation were examined as the object of the study, the state of the antioxidant defense system of pregnant women with various degrees of anemia and preeclampsia was studied as a subject of research.

The purpose of the research work: The purpose of the study is pathogenetically substantiated correction of antioxidant defense system in pregnant women with preeclampsia accompanied by anemia.

The main tasks of the research work:

1. Investigation of the incidence and consequences of pregnancies complicated by preeclampsia and anemias of different levels.
2. A comparative study of the effects of anemia-associated preeclampsia on perinatal performance.
3. Comparative study of variables in LOP and AODS in pregnant women with anemia-associated preeclampsia of different levels.

¹¹ Абрамченко В.В. Антиоксиданты и антигипоксанты в акушерстве (оксидативный стресс в акушерстве и его терапия антиоксидантами и антигипоксантами)-СПб.: Изд-во ДЕАН, 2001.-400 с.

4. Comparative study of the dynamics of dopplerometric parameters in the fetoplacental system in pregnant women with anemia-associated preeclampsia of different levels
5. Comparative study of the dynamic state of the pair hormones in the peripheral blood of pregnant women as the result of complications by preeclampsia and anemias of different levels.
6. To study the results of the application of pathogenetically justified corrective measures of the antioxidant defense system in the process of treatment of pregnant women with preeclampsia associated with anemia.

Methods of the research work: In order to achieve this goal, 122 women with preeclampsia and anemia were selected as the subject of the study. They are divided into groups according to the severity of preeclampsia and anemia. Due to the nature of the treatment, pregnant women were divided into subgroups within the group.

The severity of preeclampsia was determined on the Wittlinger scale. The diagnosis of IDA was made based on the results of the hemogram and the condition of iron in the blood (iron, the ability of blood serum to bind to total iron, the concentration of ferritin).

For assessment of the state of the antioxidant system, the activity of catalase in the blood plasma and erythrocytes of pregnant women, the concentration of vitamin E, the levels at different stages of the peroxidation process were determined.

Perfusion of fetus at different stages of pregnancy (hemodynamic dopplerometry in the maternal-fetal system) was studied, and the features of the fetus after pregnancy were studied.

The condition of the fetoplacental (fetus-pair) complex was assessed by the concentration of placental lacto-gene, estrogens, progesterone in the serum.

The main provisions submitted to the defense:

1. Preeclampsia, as a complication of pregnancy, has no tendency to decrease and in the frequency of severe cases an increase is observed.

2. Preeclampsia is often associated with anemia, and the development levels of the severity of both pathologies are parallel.
3. During the physiological pregnancy, the oxidative processes of the mother's body and the antioxidant system intensify, and the ratio between them is balanced. In case of preeclampsia accompanied by anemia this balance is violated and an increase in the intensity of the lipoperoxidation process is observed against the background of weakening of the antioxidant system.
4. In case of preeclampsia accompanied by anemia – along with the disruption of the molecular level of antioxidation, there is deterioration in the uterine-fetal circulatory system and perfusion, the placenta's hormone-producing function; the intensity of the process is proportional to the severity of the pathology.
5. Weakening of the antioxidant system during pregnancy causes pathological changes in condition of the mother, as well as the fetus, morbidity and deterioration of perinatal parameters.
6. In case of preeclampsia accompanied by anemia, it is possible to correct a damaged oxidation-antioxidant system.

Scientific innovation of the research work: For the first time:

1. Perfusion and hormonal changes in the fetoplacental system as the result of anemia, preeclampsia and their combination have been studied.
2. The mutability of AODS in pregnant women with anemia complicated by preeclampsia depending on severity of the pathology has been studied.
3. Antioxidant status of the body against the background of traditional treatment of complications in pregnant and puerperant women has been studied.

In women with severe preeclampsia combined with anemia, depending on the combination and severity rate of the pathologies as well as antiemetic treatment and other measures, perfusion in the fetoplacental complex, hormonal changes, various degrees of disor-

ders in AODS have been found. By correcting the damaged antioxidant system of the body improvements were observed in other pathological changes and clinical effects were obtained.

Theoretical and practical significance of the study: Information from the achieved results of the research work pathogenetically justified the correction of disorders of the central antioxidant system in women with severe preeclampsia combined with anemia, and the complex application of intensive care in patients.

Besides it, this information can be used for assessment of the severity rate of the pathology, its prognostic condition and effectiveness of treatment.

Approbation of the research work and application of research results: The initial discussion of the dissertation was implemented at the interdepartmental meeting (Department of Obstetrics and Gynecology, Hematology, SSRL) of the Azerbaijan State Advanced Training Institute for Doctors, (03.02.2021, protocole #1), at the scientific workshop #3 of the Dissertation Council FD 2.11 on date 12.03.2021. The results of the research work were reported on the International Correspondence Scientific-Practical Conference in Tbilisi (2010 year), at the Republican Scientific-Practical Conference on Obstetrics, Some Issues Of Gynecological Pathologies in Sumgayit city (2010).

The results of the dissertation have been published in 5 scientific-practical journals, including Ukrainian journals, 7 theses and 2 reports in the collections of scientific conferences in the relevant list of the Higher Attestation Commission over the past five years.

The results of the implemented scientific research work included in the practice in the City Clinical Hospital #3. Materials of the research work are used for teaching process at the Department of Obstetrics and Gynecology of the Azerbaijan State Advanced Training Institute for Doctors.

The institution where the dissertation was prepared: SSRL of the Azerbaijan State Advanced Training Institute for Doctors named after A.Aliyev and the City Clinical Hospital #3.

Volume and structure of the dissertation. The dissertation consists of an introduction (- 10842 symbols), main chapters (Chapter I- 47783 symbols, Chapter II - 52511 symbols, Chapter III – 20071 symbols, Chapter IV – 15030 symbols, Chapter V – 12309 symbols, Chapter VI – 15837 symbols, Chapter VII – 9403 symbols), final – 52038 symbols, achieved results (3544 symbols), practical recommendations (1803 symbols), literature review and appendixes. Total volume of the dissertation in symbols is 241171 (excluding table of contents, bibliography, 39 tables, 29 diagrams) symbols. 219 local, Russian and foreign sources are included into literature review.

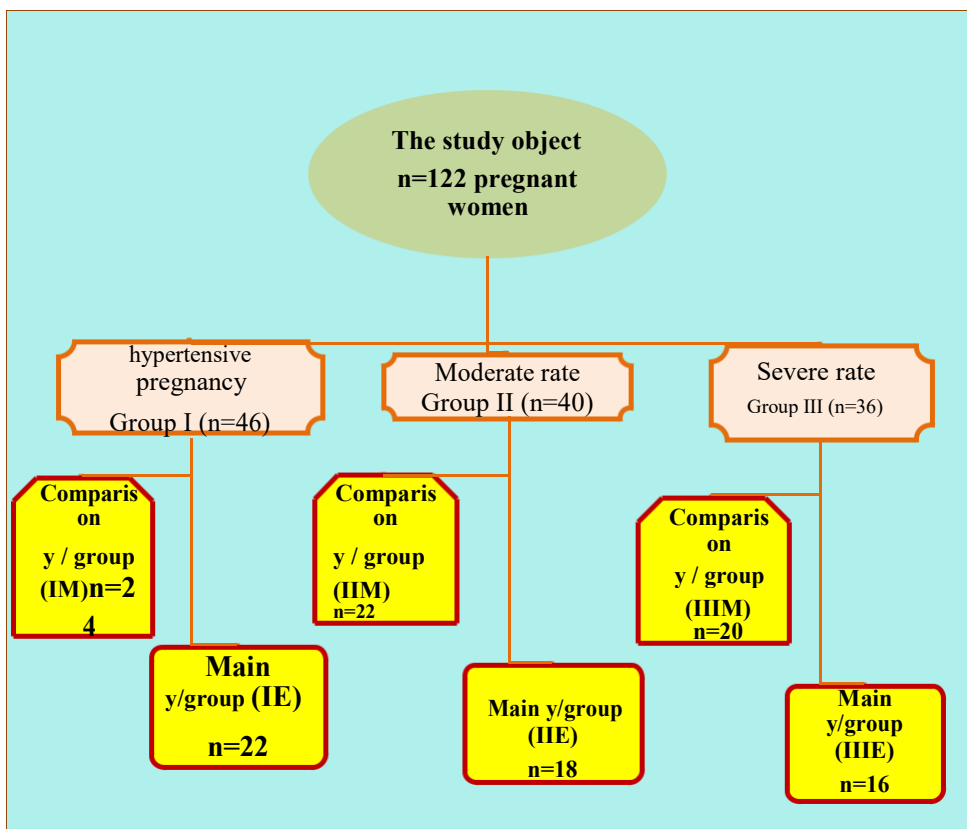
MATERIALS AND METHODS OF THE RESEARCH WORK

In order to study the incidence of preeclampsia and its complications among pregnant women entering the clinic the total number of pregnant women who applied to the maternity department of the clinic during 4 years (2013-2016) for delivery and treatment of this pathology, and the list of pregnant women with preeclampsia was taken, the usual statistical analysis was conducted.

In case of preeclampsia complicated with anemiaprospective materials were divided into groups and clinically characterized in order to visually draw attention to the picture and urgency of the problem in the antioxidant system of the pregnant body.

Pregnant women selected for the prospective study were divided into groups due to severity rate of the pathology (see the Scheme!). Due to characteristics of implemented treatment measures those pregnant women were divided into subgroups within the groups. On later periods of the pregnancy despite changes in the severity of the pathology, the patients included in each group or subgroups were studied in that group until the end of the research work.

Totally 122 women have been involved to examinations. They were studied within three groups. Based on the known classification of those contingents were divided to three groups: group I - pregnant women with pregnancy hypertension (46 women); group II – pregnant women with moderate to severe preeclampsia (42 women); group III - pregnant women with severe preeclampsia (36 women).



Scheme. Division of pregnant women into groups and subgroups for prospective study

On period of the pregnancy more than 33-35 weeks pregnant women with various degrees of combined anemia and preeclampsia, who applied to the maternity department of Clinical City Hospital No. 3 were included as the main group. They were involved to examination within sub-groups and dynamics in the prenatal period were followed by these examinations. The results of the examinations achieved in both groups were studied comparatively.

In order to determine the degree of deviation of the studied indicators, 60 healthy pregnant women aged 18-38 years (without any extragenital diseases), who had applied to the maternity hospital

at that time, were taken by random sampling method; they formed a control group.

Pregnant women were observed in their groups from 33rd-35th weeks of gestation until the end of pregnancy. The severity of preeclampsia was determined according to a known classification.

Examination methods of the research work

According to purpose and plan of the dissertation, besides the general clinical and laboratory studies the following examination methods have been used:

1. Ultra sound examination (USE) of placenta and fetus;
2. Cardiotocography examination (KTE);
3. Dopplerometry examination method;
4. Determination of placenta hormone levels;
5. Materials and methods for morphological examination;
6. Method of statistical processing of the obtained indicators.

Ultra sound examination (USE) of placenta and fetus:

Ultrasound was used to assess the condition of the fetus and the placenta, the amniotic fluid. For this purpose, the SHIMADZU Corporation SDH-450 (made in Japan) was used within examination starting from 24th week of pregnancy. In this case, the biparietal size of the fetal head (SFH), the average diameter of the abdomen (AD), the length of the femur (FL), the location of the placenta, its size, the amount and nature of amniotic fluid were assessed.

Cardiotocography examination (KTE): KT examination of the fetus is a non-invasive method and is completely safe for the mother and fetus. KTE is highly informative when performed and evaluated correctly.

Dopplerometry examination method: Doppler examination was used to study the nature of the placenta's blood flow. For this purpose, "Aloka" 1700 SSD color Doppler device was used. The device is equipped with a Doppler sensor block that can receive pulsating waves at a frequency of 3.5-5 mGh.

Biochemical research methods: The following biochemical examination methods were used in accordance with the dissertation plan:

1) Iron exchange indicators:

- Iron level in the blood (plasma and erythrocytes) - Fe_{pl} vø Fe_{er});
- Transferring;
- The ability of blood serum to bind iron
- Ferritin.

2) AODS indicators:

- Vitamin E (in plasma and erythrocytes - E_{pl} vø E_{er});
- Catalase activity (in plasma and erythrocytes - KAT_{pl} vø KAT_{er});

3) LOP products indicators:

- Hydroperoxides of lipids (LHP_{pl}) (62);
- Malone dialdehyde (in plasma and erythrocytes- MDA_{pl} vø MDA_{er}) (38).

4) Serum lipid metabolism indicators:

- Total cholesterol (TCh);
- α -XS of high-density lipoproteins (HDLP);
- Triglycerides (TG).

Statistical processing of achieved results: All indicators obtained during the study were statistically analyzed taking into account modern recommendations. The indicators in the groups are arranged in a series of variations, and for each variation series, the average index (M), the standard deviation (σ), standard error (m), minimum (min) and maximum (max) values were calculated. Since it was not possible to determine the presence of, the non-parametric method - Wilcoxon (Manna-Winty) criterion (U) was used to determine the difference between the indicators in the groups.

Stages of examination and treatment methods: Diagnostics: Implemented treatment was detected depending on severity rate of preeclampsia and anemia, the characteristics of the pathology, the symptoms that occur. Treatment: Depending on the severity of the pregnancy and the fetus, the severity of the anemia and hypertension the complex pathogenetic therapy of pregnant women with pree-

lampsia accompanied by anemia includes antithrombocyte-Thrombopol 75 mg and antioxidant drug (Fortekebd) in addition to antihypertensive, correction of anemia for the prevention of complications that may occur in pregnant woman and fetus.

Betamethasone 12 mg 2 doses were administered every 24 hours for prevention of fetal respiratory distress syndrome in pregnant women with moderate to severe preeclampsia. Pregnant women with moderate to severe preeclampsia were prescribed antihypertensive drugs methyl dopa-Dopegit 250-500 mg, maximum daily dose up to 2000 mg, maximum daily dose of Nifedipine 10-20 mg 60 mg.

Pregnant women taken as prospective clinical material were divided into different age groups and analyzed according to the severity of preeclampsia within the group. At this time, it was found that at 33rd -35th weeks of gestation, the incidence of preeclampsia in different age groups of pregnant women with different severity was different. Thus, 8.5% of pregnant women with this pathology aged 18-20 years (10 pregnancies); Women aged 21-26 and 27-30 (45 and 48 pregnant women) years made up the majority (38.1% and 40.7%, respectively). Share of pregnant women older than 30 years (15 women) was 12.7% and they were underrepresented.

It can be concluded once again that the complications of preeclampsia in pregnancy among young first-born women, as well as in those over 30 years of age, have a more severe form and course than in other age groups.

It was found that among women with preeclampsia at 33rd - 35th weeks of gestation (122 women) mild - grade I anemia 33.61% (41 cases), moderate - grade II anemia 39.34% (48 cases) and severe - grade III anemia was seen in 27.05% (33 cases) of cases. However, this ratio of the severity of anemia in groups with different severity of preeclampsia was observed with a different pattern. Thus, among pregnant women with mild anemia (41 women), gestational hypertension was 48.78% (20 women), moderate to severe preeclampsia was 39.02% (16 women) and severe preeclampsia was 12.20% (5 women).

In pregnant women with severe anemia, the severity of preeclampsia was quite different: gestational hypertension was 15.15% among these pregnant women; moderate preeclampsia was 30.30% and severe preeclampsia was 54.55%.

It can be concluded that the frequency of severe preeclampsia in severe anemia, as well as the specific gravity of severe anemia in severe preeclampsia, is higher. In other words, there is a direct correlation between the severity of preeclampsia and anemia. The emergence and development of these pathologies are almost complementary.

Also, the results of a study of the severity of anemia in groups formed according to the severity of preeclampsia show that the severity of anemia became deeper as the severity of the groups associated with preeclampsia increased.

The specific gravity of abdominal births in the observed pregnancies was studied in comparison with the control group. It was found that in the group of healthy pregnant women, the frequency of surgical births was 11.67% (7 out of 60 women), while among pregnant women with the pathology under study, this figure was 30.36% (34 out of 122 pregnancies). Thus, the share of surgical births in pathological pregnancies is 2.6 times higher.

Takin all this features into consideration, characteristics of changes in LOP-AODM balance among pregnant women with preeclampsia complicated by anemia was analyzed.

It became clear that, although the indicators of the antioxidant system in both cases increased significantly on the 33rd -35th weeks of pregnancy, the rise in the enzyme ring was more pronounced than in the vitamin ring of the system. Thus, compared with non-pregnant women, catalase was 68.47% higher in plasma and 76.65% higher in erythrocytes, while α -tocopherol in the vitamin ring was 56.10% higher in plasma and 47.02% higher in erythrocytes.

At the same time, an increase in the amount of lipoperoxidation products was observed. Also, the variability in the direction of their increase was more pronounced than the variability in AOMS. Thus, at 33-35 weeks of gestation, plasma levels of lipoperoxide, the pri-

mary product of LPO, and malone dialdehyde, the intermediate product, increased 1.82 and 1.76 times, respectively.

It was found that the changes in the body's AOMS at 33-35 weeks of pregnancy varied depending on the severity of preeclampsia and anemia. Thus, in severe pathology, a decrease in plasma levels was observed in both rings of the system, in particular. At the same time, catalase was significantly lower than α -tocopherol (17.62% vs. 10.34%). However, their erythrocyte levels were resistant to decline (especially α -tocopherol levels: 9.76% and 4.39%).

The results of our study showed that in case of a complication of a hypertensive condition, there is a certain strain in the body's antioxidant defense and the intensity of the SRO process increases, resulting in increased levels of LPO products. Thus, the amount of both primary (LP) and secondary (MDA) products increases compared to healthy pregnant women. In this case, the increase occurred mainly in plasma values. The amount of MDA in erythrocytes increased by a relatively low percentage. These factors show that in mild cases of pathology, the increase in the amount of LOP reserves is compensated, even if the tension in the body's antioxidant system increases.

It turns out that as the severity of the pathology increases, the intensity of the SRO process increases, and in connection with this there is an excessive accumulation of toxic products of LPO in the body. As a result, profound clinical disorders occur in various functions of the body.

The effect of different treatments on the antioxidant-lipoxidation system in women with preeclampsia complicated by anemia has been studied. Therefore, according to the purpose and plan of the dissertation, a group of pregnant women of different weights was divided into subgroups within these groups due to the nature of the treatment (relevant comparison and main subgroups: IM subgroup (n = 24) and IA y / q (n = 22), IIM y / q (n = 22) and IIE subgroup (n = 20), IIIM subgroup (n = 20) and IIIIE subgroup) (n = 16). Thus, pregnant women who received traditional treatment in the relevant severity groups formed comparative subgroups, and those who received the proposed treatment formed the main subgroups.

The results achieved in this stage of the study, generally were compared within the relevant group and between the main subgroups, as well as with the group of healthy pregnant women, and the effects of different treatments on the AODS-LOP system were investigated. Towards the end of gestation, the amount of lipoperoxidation products continued to increase in pregnant women and was significantly higher than in healthy pregnant women ($p < 0.05$). However, during the correction of antioxidants purposefully added to the traditional treatment of the antioxidant system (in IE subgroup), a relatively weak intensity of LOP processes was observed and, as a result, less accumulation of lipoperoxidation products than in the previous subgroup. Such dynamics was accompanied by a positive change in the dynamics of AOMS. Against the background of anemia, pregnant women receiving conventional treatment for moderate preeclampsia observed a greater intensification of the SRO process in tissues and blood due to the weakening of AODS in pregnant women and, accordingly, a marked accumulation of lipid secondary and final peroxide products and elevated blood levels.

However, different dynamics were observed in pregnant women of the same type (IIE subgroup) who underwent targeted antioxidant correction in the proposed combination. Levels of lipid peroxides in this subgroup were lower than the comparison subgroup (traditional treatments) with the severity of the differences. As a result, the amount of these toxic products, especially in erythrocytes, approached the levels of healthy pregnant women, and the differences between them decreased to 3.06, 3.0 and 2.3 times, respectively.

Thus, although traditional treatment has been used (IIIM subgroup), there is a profound deficiency in AOS in this subgroup; Levels of indicators in both rings of the system and in both environments were much lower than not only in healthy pregnant women, but also in mild and moderate. This indicates that the effect of treatment applied in such severe pregnancies has not been satisfactory. However, as in other subgroups, there is relatively little change in vitamin antioxidants, especially in erythrocytes.

According to the literature, as well as from the initial stage of our study, the serum concentrations of antioxidants, including vitamin antioxidants, from the beginning to the end of physiological pregnancy are 1.5-2 times higher than in non-pregnant women. Such a height is necessary not only for the adequate supply of the fetus and the need for active plastic, but also for the maintenance of the lipoperoxidation-antioxidant status of the mother's body. In addition, certain levels of vitamins, especially α -tocopherols, are essential for adequate hematopoiesis and protection of erythrocyte membranes.

In pregnant women with preeclampsia complicated by anemia, as well as changes in the uterine-placenta blood circulation are expected, depending on the nature of the treatment. Therefore, our goal here was to study dopplerometric (DM) readings in the uterine artery to assess the condition of blood flow.

It was found that no signs of blood flow disturbance were observed in the control group according to the results of the DM examination of the UA. That is, although the indicators of peripheral vascular resistance have undergone certain changes in the dynamics, this is due to the dynamic processes that occur physiologically in FPK during pregnancy progression. Thus, as a physiologically advanced pregnancy develops, peripheral vascular resistance decreases. So, a high systolic wave and diastolic blood flow are characteristic of the DM spectrum of UA at the end of pregnancy during the physiological course of pregnancy; therefore, it is reflected in the decrease in the values of vascular resistance indices.

Pregnant women with preeclampsia complicated by anemia developed a different picture in the dynamics of DM in UA during that period of hestasis. Thus, at 34-35 weeks of gestation, vascular resistance was significantly higher in these pregnant women than in the control group.

Thus, there were different changes in the uterine-placenta blood circulation of FPK, i.e. dopplerometric indicators of uterine vessels; these changes have led to a weakening of blood flow and a decrease in perfusion in these areas.

According to dissertation plan dynamic variability of plasma levels of estriol, progesterone, prolactin, chorionic gonadotropin in

pregnant women with preeclampsia complicated by anemia was studied.

The study of the dynamics of blood levels of placenta hormones in preeclampsia showed that, depending on the degree of pathology and the degree of circulatory disorders, they are subject to changes in the same direction and with different manifestations. Thus, as the severity of preeclampsia increases, their levels gradually decrease, and in severe preeclampsia, the levels of Pr, HcG and PL are close to 50% of normal values, i.e. halved. These levels indicate the onset of FPD and worsening of the condition of the fetus. The maintenance of estriol levels to about 75% can be explained by the compensation of the hormone-producing function of the hypothalamic-pituitary system.

Thus, during preeclampsia, a common pathology of pregnancy, dopplerometric values of vascular resistance of the placenta and other organs increase due to total vascular spasm in the female body. As a result, the microcirculation and perfusion of the organs deteriorate the intensity of blood flow decreases. Accordingly, the amount of placenta hormones in the blood decreases. As the severity of the pathology increases, these changes deepen. The proposed treatment, which includes drugs that increase the couple's perfusion, strengthen the rheological properties of the blood and strengthen the antioxidant defense system, can achieve better results than traditional treatment. Therefore, in preeclampsia with anemia, we consider this treatment to be pathogenetically justified.

It was found that the share of premature newborns in the group of pregnant women with preeclampsia with anemia was 72.13% (88 newborns) (in the control group this figure was 95.08%). 2 (2.27%) of them were stillbirths (from mothers with severe preeclampsia); that is, there were 86 children born alive (97.73%). Different degrees of malnutrition were observed in 36 (40.91%) of those born on time. In general, the proportion of hypotrophic newborns born to preeclampsia mothers was 10 times higher (4.31% vs. 40.91%; $p < 0.001$). The degree of malnutrition was proportional to the severity of maternal preeclampsia and anemia.

The weight of premature infants in the moderately severe preeclampsia subgroup receiving conventional treatment was 23.13% of the average weight of healthy newborns born prematurely, and to some extent (10.4%) of preterm infants born to mothers of the same degree (control group) and significantly less than preterm births. 14.74%).

However, in the subgroup of patients treated with antioxidants (IE subgroup), the weight of newborns was 6.54% higher than in the traditional treatment and was closer to the level of the control group.

Thus, during preeclampsia combined with anemia, significant differences in the weight of newborns were observed, depending on the severity of the pathology. Especially, the depth of malnutrition was more pronounced in children, especially during preterm births. Positive results were observed in the weight of newborns compared to the comparison subgroups due to the effect of antioxidant treatment.

ACHIEVED RESULTS

1. There was no decrease in quantity of preeclampsia accompanied with anemia in pregnant women, and there was a direct correlation between the severity of anemia and the severity of preeclampsia. Pregnancy hypertension was 48.78% among pregnant women with mild anemia; moderate preeclampsia 32.02%; severe preeclampsia was 12.20%. Severe preeclampsia was 54.55% among pregnant women with severe anemia.

The severity of preeclampsia and its complications accounted for 27.3% of all surgical births. Among pregnant women with preeclampsia, the specific gravity of abdominal births was 2.25 times higher, and the frequency of emergency operations due to pregnancy and childbirth complications was 3 times higher than planned surgeries. The share of urgent operations – was 64.71%; of planned operations was 35.25%.

2. In case of preeclampsia accompanied by anemia, the incidence of perinatal pathologies (intrauterine growth retardation, posthypoxic, posthemorrhagic encephalopathy) increased up to 10 times. The weight of newborns in groups treated with antioxidants

was 3.30% compared to other groups; 6,54% was high, positive results were observed in perinatal indicators.

3. As part of the adaptive reaction of the female body during pregnancy - an increase in free radicals, intensification of lipid hydroperoxidation processes and the amount of end products 1.82; in addition to a 1.76-fold increase, double activation of the antioxidant defense system as a compensatory mechanism and an increase in both rings of the system were observed. Defects in the antioxidant system during preeclampsia associated with anemia, due to the severity of the pathology, can not be prevented by conventional treatment, leading to a deepening of clinical symptoms and further aggravation of preeclampsia.

Improvement of pathological clinical and laboratory symptoms that occur when the corrective treatment of the antioxidant system is added. As a result, the amount of end products of free radical oxidation processes, especially in erythrocytes it decreased till 3.06; 3.0; 2.3 times.

4. In pregnant women with preeclampsia accompanied by anemia, an increase in dopplerometric vascular resistance in the fetoplacental circulatory system till 19.57%, 18.52%, 13.48%, and a decrease in perfusion was observed. The proposed corrective treatment of the antioxidant defense system is aimed at preventing an increase in vascular resistance and a decrease in perfusion in the fetoplacental circulatory system, NI; led to an improvement in the dynamics of the SDN.

5. In preeclampsia accompanied with anemia, the placenta's hormone production function is reduced by up to 50%. The proposed corrective treatment of the antioxidant defense system has led to an improvement in the placenta's hormone production function. Blood levels of hormones were significantly higher: Estradiol-14.3%; Progesterone-17.7%; HcG-44.2%; Prolactin-57.9%.

6. Levels of all studied indicators of the antioxidant system were significantly higher in pregnant women receiving the proposed corrective treatment of the antioxidant defense system than in other patient groups; Cat. (Pl) -19.51%, Cat (er) -11.42%, VitE (pl) -12 / 75%, VirE (er) -7.99% were high. Antioxidant protection in pre-

eclampsia with anemia Pathogenetically justified corrective measures of the system have led to the alleviation and stabilization of the disease.

PRACTICAL RECOMMENDATIONS

1. In order to adequately assess the condition of pregnant women with preeclampsia accompanied with anemia, to choose the right treatment and obstetric tactics, it is important to conduct a comprehensive examination of the body's antioxidant defense system and lipid peroxidation process

2. In women's clinics, it is advisable to expand the examination of pregnant women at risk until the first signs of anemia and preeclampsia in the early stages of pregnancy to study the state of the body's antioxidant system and the level of lipid peroxidation products.

3. When administering antianemic therapy to pregnant women, it is important to assess the state of oxidative stress and take corrective measures of the antioxidant system in order to prevent the development of preeclampsia until the onset of clinical symptoms.

4. Corrective measures of the antioxidant system should be included in standard therapy according to the severity of preeclampsia in pregnant women with preeclampsia complicated with anemia. Thus, injections and infusions as antioxidants have not been used at all, as outpatient treatment tactics are used in mild forms of hypertensive conditions. In moderate preeclampsia, injections and infusions were used during hospitalization. Outpatient (if the pregnant woman's condition allows) follow-up and treatment (phased treatment) is usually prescribed on the condition of ingestion. During severe preeclampsia, obstetric tactics were identified, the pregnancy was terminated, and corrective antioxidant treatment measures were then intensively incorporated into the main treatment.

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