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**ABSTRACT**

of the dissertation for the degree of Doctor of Philosophy

**CLINICAL DIAGNOSTIC FEATURES OF THE BIRTH  
PROCESS IN WOMEN WITH MILD PREECLAMPSIA**

Speciality: 3215.01 – Obstetrics and gynecology

Field of science: Medicine

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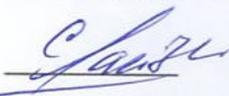
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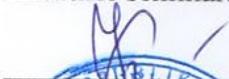
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## GENERAL REVIEW OF THE WORK

**Relevance of the topic.** One of the current problems of modern obstetrics is hypertension during pregnancy. The incidence of hypertension during pregnancy is 2-10%, which increases significantly to control maternal and fetal mortality<sup>1</sup>.

According to the classification of research groups investigating high blood pressure during pregnancy, 4 hypertensive conditions are identified during pregnancy. These include: chronic hypertension, preeclampsia, eclampsia, preeclampsia on the background of chronic hypertension, gestational hypertension<sup>2</sup>.

According to modern scientific research, preeclampsia is observed after the 20<sup>th</sup> week of pregnancy with a symptom-complex of hypertension, proteinuria, edema. Such pregnant women develop pathological symptoms in many organs and systems. This is manifested by hemolysis, an increase in the amount of liver enzymes in the blood, a decrease in the number of platelets, a functional deficiency of large organs and systems. Among them, pulmonary edema, acute renal failure, liver failure are being observed.

It should be noted that despite the large number of scientific studies to assist in the process of childbirth, the characteristics of labor activity in patients with preeclampsia have not been studied. Considering the urgency of the problem, the study was scheduled.

**Object of the research.** The study included women with mild preeclampsia.

**The purpose of the research.** To study the characteristics of the birth process in women with mild preeclampsia.

### **Research objectives:**

1. To study the effects of maternal and fetal performance on the characteristics and complications of labor in women with mild preeclampsia (based on retrospective material).

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<sup>1</sup>Волкова, Е.В. Оптимизация тактики ведения беременных с преэклампсией // Ж. Проблемы репродукции – 2012. №6, – с. 63-67.

<sup>2</sup>Меликова, У.Ф. Особенности течения беременности и родов, состояние плода и новорожденного у больных с эклампсией / У.Ф. Меликова, Э.М. Алиева, Ш.Ш. Асадова [и др.] // Ж. Здоровье женщины – 2014. №4, – с. 97-99.

2. To study the characteristics of pregnancy and the course of this obstetric complication in women with mild preeclampsia. Assessment of cervical maturity at 39-40 weeks of gestation.

3. To study the characteristics of uterine cumulative activity in women with mild preeclampsia and to conduct a comparative analysis (based on the method of external intrapartum cardiotocography).

4. Assessment of the condition of the fetus in the dynamics of spontaneous births in women with mild preeclampsia.

5. Determination of enzyme and electrolyte changes in the dynamics of childbirth in women with mild preeclampsia.

6. To study the characteristics of oxygen transport and changes in acid-base parameters in women with mild preeclampsia.

**Research methods.** The study used clinical-anamnestic, instrumental (ultrasound, external antenatal cardiotocography, intranatal cardiotocography), laboratory (determination of capillary blood acid-base and gas status) methods and the National Institute for Health and Clinical Excellence classification.

**The main provisions submitted to the defence:**

1. In 79,4% of women with mild preeclampsia, the cervix matures in the last weeks of pregnancy,  $6,1 \pm 0,2$  points on the M.S.Brunchill scale modified by E.A.Чернуха, and 20,6% are incomplete,  $3,2 \pm 0,3$  points are assigned to this scale.

2. Early signs of chronic intrauterine fetal hypoxia are detected in 53.6% of women with mild preeclampsia, and noticeable signs of chronic hypoxia in 11,3%. The frequency of acute hypoxia in the background of chronic hypoxia of the fetus is 19.6%. Causes of acute hypoxia of the fetus include absolute shortness of the umbilical cord, umbilical cord entanglement in the neck of the fetus and other parts of the body, hyperstimulation of childbirth, acute adhesion of the umbilical cord to the edge of the placenta, and true knot of the umbilical cord.

3. According to the external intrapartum cardiotocography examination of women in the latent phase of labor with mild preeclampsia, the intensity of contractions, uterine contractions, ejaculation, total duration of contractions, uterine activity is

significantly higher and the duration of the latent phase is significantly shortened. The duration of the latent phase is  $1,24 \pm 0,11$  hours.

4. In women with mild preeclampsia, the course of childbirth is marked on the background of hypoxemia and manifests itself in the first period of blood oxygen saturation and with a significantly lower level of hemoglobin and pH.

**Scientific novelty of the research.** As a result of scientific research, the effects of pregnancy and childbirth on the mother, fetus, and newborn in women with mild preeclampsia, uterine accumulation activity in the dynamics of the birth process were studied. It was determined that women with mild preeclampsia have coordinated labor in the latent phase of childbirth, which indicates statistically high in the intensity of self-contractions, uterine contractions, ejaculation, total duration of contractions, uterine activity while a significant decrease in the interval between contractions and the total duration of the uterine cycle is noted. Births of women with mild preeclampsia are defined as statistically significant low levels of oxygen transport. This also reflects the background of hypoxemia in childbirth.

**The practical significance of the research.** The study found that in the last weeks of pregnancy, the cervix is mature, which is manifested by a significant shortening of the latent phase of labor. The incidence of fetal hypoxia in women with mild preeclampsia is 19,6%, which is mainly due to pathology of the umbilical cord. In women with mild preeclampsia, the course of labor is determined against the background of hypoxemia and manifests itself in a statistically significant decrease in blood oxygen saturation, hemoglobin, and pH. In women with mild preeclampsia, the activity of metabolic processes in the dynamics of childbirth is reflected in a significant increase in the enzyme alkaline phosphatase, sodium and potassium electrolytes.

**Approbation.** Materials of the dissertation reported at the XV Symposium of Azerbaijani Urologists and Andrologists "Genetic aspects of urology and reproductive medicine" (Baku, 2019); at the conference on "Actual approaches to some problems of obstetrics

and gynecology in Azerbaijan" (Baku, 2019).

The materials of work was approved at a meeting of the I Department of Obstetrics and Gynecology of Azerbaijan Medical University (AMU) (24.04.2018, the protocol No 17), at the scientific seminar of the Dissertation Council ED 2.06 at the AMU (12.03.2021, protocol No 3).

**Implementation of research results into practice.** The achieved results were used in the teaching process of the I Department of Obstetrics and Gynecology, in the clinical process of the Educational Surgery Clinic of AMU.

**The name of the organization where the dissertation has been accomplished.** The dissertation was completed at the I Department of Obstetrics and Gynecology of Azerbaijan Medical University.

**Published works.** 8 scientific works on the topic of the dissertation have been published. 6 of them, 2 theses, including 1 articles and 1 thesis were published abroad.

**Volume and structure of the dissertation.** The dissertation is written on 162 computer pages of computer text (170069) consists of literature review, chapter of material and methods, results of own research, conclusions, findings, practical recommendations and bibliography. The dissertation contains 53 tables, 12 charts and 23 figures. The bibliography includes 232 sources (5 in Azerbaijani, 57 in Russian and 170 in English).

## **MATERIALS AND METHODS OF THE RESEARCH**

According to the target, 97 women with mild preeclampsia were included in the study (prospective study). The National Institute for Health and Clinical Excellence (2013) classification was used to determine the degree of hypertension in pregnant women with preeclampsia.

At the same time, the characteristics of childbirth, the effect on the mother, fetus and newborn were assessed in 101 women with mild preeclampsia (retrospective material).

The study was conducted at 38 weeks of gestation and the dynamics of birth. In the study, the degree of maturity of the cervix in the last weeks of pregnancy was assessed by the M.S.Brunchill

scale, antenatal cardiotocography, ultrasound examination of the fetus, placenta and amniotic fluid.

The mean age of postpartum women included in the retrospective material was  $25,1 \pm 0,45$  (18-39).

When analyzing menstrual function in these women, it was determined that menarche was  $12,85 \pm 0,1$  years, the duration of menstruation was  $4,94 \pm 0,11$  days, and the duration of the menstrual cycle was  $32,0 \pm 0,12$  days.

When studying the anamnesis of postpartum women, it was determined that sexual life was  $21,24 \pm 0,29$  (16-32) years. The number of first-born women was 50 (49,5%) and the number of repeat births was 51 (50,5%).

Thus, according to retrospective material, the number of first and second births was almost the same. The mean number of pregnancies in repeat births was  $2,57 \pm 0,5$ .

The incidence of chronic inflammatory diseases of gynecological diseases in women included in the study is 74,8%.

The prospective material included 97 pregnant women with mild preeclampsia. The mean age of the pregnant women was  $25,24 \pm 0,42$ .

When studying the menstrual function of pregnant women included in the study, menarche was  $12,73 \pm 0,09$  years, the duration of the menstrual cycle was  $30,6 \pm 1,19$  days, and the duration of menstruation was  $4,95 \pm 0,1$  days. Sexual activity of pregnant women with mild preeclampsia was started at the age of  $21,1 \pm 0,31$  years. Of the 97 pregnancies, 58 (59,8%) were first-born and 39 (40,2%) were reborn. The mean number of repeat pregnancies was  $1,73 \pm 0,12$ . The number of births was  $1,48 \pm 0,12$ , and the number of abortions was  $1,53 \pm 0,27$ .

The incidence of gynecological diseases in pregnant women with mild preeclampsia is determined by chronic inflammatory diseases of the reproductive organs was (74,4%).

All patients with mild preeclampsia included in the prospective study were examined from 38 weeks of gestation. First of all, the general condition, blood pressure, edema were determined. Laboratory, biochemical examinations of blood hemostasiogram were performed. In order to study the condition of the fetus and the

placenta, an ultrasound examination was performed to determine the condition of the fetus, amniotic fluid, and placenta.

Assessment of cervical maturity in all pregnant women. The M.S.Brunchill scale modified by Ye.A.Chernukha was used.

According to the Burnchill scale, a score of 0-2 on the cervix is considered immature, 3-4 points on an incomplete adult, and 5-8 points on a mature cervix.

***Clinical examination.*** The study assessed the severity of preeclampsia at 38 weeks of gestation and the dynamics of birth, along with obstetric examination.

***Ultrasound examination.*** At 38 weeks of gestation, an ultrasound examination was performed to examine the condition of the fetus and the placenta before delivery. Ultrasound examination measured the biparietal size of the fetal head, the circumference of the fetal uterus, the circumference of the abdomen, and the length of the fetal femur. Obtained results compared with echographic physiological indicators presented by Hadlock F.P. et.al (1982).

***External antenatal cardiotocography.*** External cardiotocographic (CTG) examination was performed at 38 weeks of gestation. The study was performed using the "non-stress" method when the woman was lying on her back or side for 60 minutes.

***Intrapartum cardiotocography.*** The method of intrapartum cardiotocography was used in the dynamics of birth to study the accumulation activity of the uterus. Cardiotocography was performed using a device with 2 transmitters "Bionet (England)". The first transmitter is used to record the fetal heart rate, and the second transmitter is used to record the accumulation activity of the uterus. Cardiotocography was performed posteriorly or sideways in the dynamics of labor. The writing speed of the paper was 1 cm/min.

The following indicators were determined on intrapartum cardiotocography:

- intensity of contractions, mm Hg; uterine contractions, seconds; uterine discharge, seconds;
- duration of contractions, seconds; duration of the interval between contractions, seconds; the number of contractions in 10 minutes; duration of the uterine cycle, seconds; the ratio of uterine

contractions to discharge (K1); the ratio of uterine contractions to total contractions (K2); determination of childhood activity:

a) Montevideo unit = intensity of contractions x frequency of contractions;

b) Alexandria unit = Montevideo unit x childhood assembly.

Indicators of uterine cumulative activity were compared with those of spontaneous births that did not have anomalous labor activity.

***Determination of acid-base and gas status of capillary blood during childbirth.*** To study the acid-base status of the blood and the gas content of the blood, blood was taken from a standard heparinized capillary from the nail phalanx of the finger and determined with high accuracy in an "Epx" blood gas analyzer (Alere).

The study identified the following indicators.

- pH of the blood;
- $p\text{CO}_2$  – partial pressure of carbon dioxide in the blood, mmHg;
- $p\text{O}_2$  – partial pressure of oxygen in the blood;
- $\text{HCO}_3$  – bicarbonates in blood plasma;
- $\text{TCO}_2$  total amount of carbon dioxide in plasma mmol/l;
- BE-ECF, BE-B – deficiency of blood bases;
- Sat ( $\text{SO}_2$ ) – oxygen saturation of the blood, %.

Normative indicators of acid-base bases of blood were used.

- pH 7,35-7,45
- $p\text{CO}_2$  35-45 mmHg
- BE-B $\pm$ 2,5 mmol/L
- BE-ECF $\pm$ 2,9 mmol/L
- $\text{TCO}_2$  24-33 mmol/L

At the same time, the amount of  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Ca}^{++}$  ions and Hct, cHqb, glucose (Glu), and lactate (Lac) in the capillary blood was determined.

During the first, second, and third stages of labor dynamics, blood was taken from a vein and a biochemical examination was performed. The amount of potassium ( $\text{K}^+$ ), sodium ( $\text{Na}^+$ ), chlorine ( $\text{Cl}^{-1}$ ), calcium ( $\text{Ca}^{++}$ ) in the capillary blood was determined.

Amino aminotransferase (ALT), aspartate aminotransferase

(AST), lactate dehydrogenase (LDH), alkaline phosphatase (ALP), and creatinine phosphokinase (CK) were determined to study the enzymatic activity of the liver at birth.

In the study, the birth characteristics of 101 women with mild preeclampsia were studied retrospectively and the course of pregnancy of the patients included in the material was analyzed.

As a result of the study, it was determined that out of 101 women who gave birth, 50 (49,5%) were first-born and 51 (50,5%) were second-born women.

Thus, the number of first-born and second-born women in the reproductive material was almost the same.

When analyzing labor activity in women with mild preeclampsia, it was found that in 88 women (87,1%) the birth was uncomplicated. The duration of the first stage of labor is  $7,4 \pm 0,16$  (4-12) hours, the duration of the second stage is  $28,8 \pm 0,31$  (8-60) minutes, and the third period is  $8,2 \pm 0,28$  (3-15). was min. The total birth period was  $7,51 \pm 0,17$  (4,28-13,5) hours. It should be noted that 22 (21,8%) women gave birth spontaneously.

In 87,1% of women with mild preeclampsia, childbirth was considered uncomplicated, and in 21,8%, rapid delivery.

In 6 (5,9%) women with mild preeclampsia, labor was complicated by primary cramp weakness, in 5 (5,0%) by premature ejaculation, and in 2 (2,0%) by hypotonic bleeding.

Thus, 13 women with mild preeclampsia had complications during childbirth (12,9%).

During childbirth, a woman's systolic blood pressure was  $142,55 \pm 0,5$  (130-150) mm Hg, and diastolic blood pressure was  $98,12 \pm 0,66$  (80-110) mm Hg.

***Statistical processing of the results obtained.*** The statistical indicators obtained as a result of the study were processed statistically. For each group, the numerical mean, standard deviation of the numerical mean, its standard error, and the minimum and maximum values of the series were determined. The association coefficient or tetrachoric index, proposed by K. Pearson, was used to determine the main relationship between the parameters studied in the main group and the comparison group. In addition, in the study

groups, a correlation analysis was carried out to identify correlations between different indicators. For this, a correction factor was calculated and the Z-Fisher transformation was used to determine the accuracy of the resulting factor.

## RESEARCH RESULTS AND DISCUSSIONS

In the research, the birth characteristics of 101 women with mild preeclampsia were studied retrospectively and the course of pregnancy of the patients included in the material was analyzed<sup>3</sup>.

As a result of the study, it was determined that out of 101 women who gave birth, 50 (49.5%) were primiparous and 51 (50.5%) were multiparous.

Thus, the number of primiparous and multiparous women in the reproductive material was practically the same.

When analyzing labor activity in women with mild preeclampsia, it was found that 88 women (87.1%) gave birth without complications. The duration of the first stage of labor is  $7.4 \pm 0.16$  (4-12) hours, the duration of the second period is  $28.8 \pm 0.31$  (8-60) minutes, the third period is  $8.2 \pm 0.28$  (3-15) minutes. The total period of labor was  $7.51 \pm 0.17$  (4.28-13.5) hours. It should be noted that 22 (21.8%) women gave birth spontaneously.

In 87.1% of women with mild preeclampsia, childbirth was considered uncomplicated, and in 21.8% - rapid.

In 6 (5.9%) women with mild preeclampsia, labor was complicated by I degree of weakness, in 5 (5.0%) women with premature waste of water and in 2 (2.0%) with hypotonic bleeding.

Thus, complications were reported in 13 (12.9%) women with mild preeclampsia.

During childbirth, the systolic blood pressure of women is  $142.55 \pm 0.5$  (130-150) mm Hg, and diastolic blood pressure -

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<sup>3</sup>Abbasova, N.V., Əliyeva, E.M., Qaraşova, M.A. Yüngül preeklampsiya olan qadınlarda hamiləliyin gedişatının xüsusiyyətləri // – Bakı: Azərbaycan Təbabətinin Müasir Nailiyyətləri, – 2017. №2. – s. 208-215.

98.12±0.66 (80-110) mm Hg<sup>4</sup>.

### **The course of features of pregnancy in women with mild preeclampsia (based on prospective material)**

The frequency of complications of the current pregnancy was studied in 97 women included in the study. Characteristics of the first trimester of pregnancy in 53,6% of women with mild preeclampsia, the pregnancy was uncomplicated, 19,6% had anemia, 11,3% had a frightening miscarriage, 3,1% had a miscarriage, 7,2% had an early toxicosis of pregnancy and acute respiratory viral infection in 5,2%.

In the second trimester of pregnancy, the incidence of various extragenital and obstetric complications has increased, and the number of uncomplicated pregnancies has decreased significantly. It was found that 20,6% had anemia, 32% had a severe miscarriage, and 23,7% had asymptomatic bacteriuria. The incidence of acute miscarriage (7,2%), hestatic pyelonephritis (5,2%), and acute upper respiratory tract infections (5,2%) were relatively low.

The course of the third trimester was characterized by mild preeclampsia in all pregnant women, including edema, varying degrees of proteinuria, and hypertension. The frequency of complications was determined to be 61,4% of mild preeclampsia, 15,2% of anemia, 8,2% of asymptomatic bacteriuria, 7,0% of preterm birth, and 5,7% of chronic fetal hypoxia. In isolated cases, lower peripheral varicose veins (1,9%), hydronephrosis (0,6%) were identified<sup>5</sup>.

The duration of mild preeclampsia in the examined pregnant women was 3,2±0,11 (1-4) weeks.

In the examined women, Hb was 107,24±1,3 g/dL, leukocyte count was 9,86±0,39 10<sup>9</sup>/L, and platelet count was 264,68±11,83 10<sup>9</sup> L.

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<sup>4</sup>*Abbasova, N.V., Əliyeva, E.M.* Yüngül preeklampsiya olan qadınlarda hamiləliyin, doğuş fəaliyyətinin xüsusiyyətləri // – Bakı: Sağlamlıq, – 2017. №3. – s.54-59.

<sup>5</sup>*Abbasova, N.V.* Yüngül preeklampsiya olan qadınlarda doğuş proksinin klinik-diaqnostik xüsusiyyətləri // – Bakı: Müasir ginekologiya və perinatologiyanın aktual məsələləri, – 2019. Cild 06. – №4. – s. 9-12.

When analyzing the general analysis of urine, it was determined that the amount of protein in the urine was  $0,33\pm 0,03$  g/L, the number of leukocytes was  $7,7\pm 0,34$  g/L, epithelial cells were  $5,86\pm 0,38$  g/S.

When analyzing the results of USM, it was determined that in 17 (17,5%) pregnant women with mild preeclampsia at 38-40 weeks, the placenta had a posterior uterus, 18 (18,6%) anterior, and 19 (19,6%) right lateral, 21 (21,6%) in the left lateral wall, 3 (3,1%) in the lower segment, and 19 (19,6%) in the bottom of the uterus.

It was determined that in 7 (7,2%) the expected weight of the fetus was more than 4000,0 gram, and in 3 (3,1%) the malnutrition of the fetus was noted.

According to the echographic examination, 9 (9,3%) pregnancies and 3 (3,1%) pregnancies were reported. In pregnant women with mild preeclampsia, the placenta's placement in different areas of the uterus occurred at almost the same frequency.

Thus, the symptoms of preeclampsia in pregnant women with mild preeclampsia were  $3,2\pm 0,11$  weeks, and in most cases, mild hypertension: systolic blood pressure  $142,2\pm 0,69$  (130-150) mm Hg, diastolic blood pressure -  $96,13\pm 0,6$  (85-110) mm Hg, proteinuria:  $0,33\pm 0,03$  g/L, hypoproteinemia  $59,3\pm 0,35$  g/L, and anemia were Hb  $107,24\pm 1,3$  g/L. 9,3% of pregnant women were diagnosed with low birth weight and 3,1% with high blood pressure. In 35% of pregnant women, the condition of the fetus in the anatomy was normal, in 53,6% there were early signs of intrauterine hypoxia, and in 11,3% there were significant cardiotocographic signs.

At 38-40 weeks of gestation, cervical maturity was achieved in 79,4% of women, and incomplete maturity in 20,6%, which is one of the factors influencing the course of childbirth.

### **Features of the birth process, uterine cumulative activity in women with mild preeclampsia**

The study examined the characteristics of the birth process in 97 women with mild preeclampsia.

Characteristics of uterine accumulation activity in the dynamics of the birth process are given in Table 1.

Table 1

**Uterine cumulative activity in women with mild preeclampsia (main group) and uncomplicated births (control group) comparative indicators (M±Se)**

Indicators n=80	I period of birth			II period of birth
	Opening of the uterine cavity, cm			
	2-4	5-7	8-10	
<b>Intensity of contractions, mmHg:</b>				
main group	43,8±2,32	71,9±2,96	83,9±2,27	93,6±1,54
control group	27,9±1,88	42,3±3,18	60,5±3,49	74,7±3,1
p	<0,05	<0,05	<0,05	<0,05
<b>Accumulation of childhood, second:</b>				
main group	28,32±1,1	37,8±1,38	31,59±1,57	38,21±2,46
control group	18,3±0,99	30,4±1,04	34,8±0,17	35,2±1,20
p	<0,05	<0,05	>0,05	>0,05
<b>Discharge of the uterus, second:</b>				
main group	43,44±1,46	52,75±1,48	49,8±1,31	48,88±2,64
control group	23,59±1,0	42,0±1,61	50,0±1,13	54,13±1,26
p	<0,05	<0,05	>0,05	>0,05
<b>Total duration of contractions, seconds:</b>				
main group	71,76±1,27	90,56±1,12	81,39±2,11	87,19±2,42
control group	41,86±2,02	72,44±1,95	84,81±2,63	89,23±2,33
p	<0,05	<0,05	>0,05	>0,05
<b>Duration of the interval between contractions, seconds:</b>				
main group	94,79±9,38	55,37±6,76	54,45±4,32	55,58±3,56
control group	448,8±0,48	261,0±0,25	212,4±0,23	150,0±1,4
p	>0,05	<0,05	<0,05	<0,05
<b>Number of contractions in 10 minutes:</b>				
main group	2,72±0,3	4,0±0,27	4,89±0,48	4,5±0,29
control group	2,34±0,12	3,68±0,16	4,43±0,03	4,72±0,02
p	>0,05	>0,05	>0,05	>0,05
Indicators n=80	I period of birth			II period of birth
	Opening of the uterine cavity, cm			
	2-4	5-7	8-10	
<b>Duration of the uterine cycle, seconds:</b>				
main group	166,55±0,28	162,9±0,42	135,84±0,21	142,8±0,33
control group	490,66±0,31	333,44±0,27	297,2±0,19	239,33±0,23

**Continuation of Table 1**

p	<0,05	<0,05	<0,05	<0,05
Ratio of uterine contractions to discharge, $K_1$ :				
main group	0,65±0,03	0,72±0,06	0,63±0,01	0,78±0,02
control group	0,77±0,06	0,72±0,09	0,70±0,02	0,65±0,04
p	>0,05	>0,05	<0,05	<0,05
The ratio of uterine contractions to total contractions, $K_2$ :				
main group	0,39±0,01	0,42±0,03	0,39±0,02	0,44±0,03
control group	0,44±0,03	0,47±0,01	0,41±0,06	0,39±0,03
p	>0,05	>0,05	>0,05	>0,05
Childhood activity, with Montevideo unit:				
main group	119,1±23,4	287,6±21,1	410,0±28,3	421,2±18,5
control group	65,3±17,5	156,0±21,1	268,2±18,9	352,4±20,8
p	>0,05	<0,05	<0,05	>0,05
Childhood activity, with the Alexander unit:				
main group	3372,9±82,2	10874,2±123,1	12951,9±120,6	16094,1±128,1
control group	1193,0±0,59	4749±100,1	9336±112,8	12404,5±120,5
p	<0,05	<0,05	<0,05	<0,05

The study found a statistically significant increase in the intensity of labor in the dynamics of childbirth in women with mild preeclampsia ( $P < 0,05$ ).

When analyzing the indicators of uterine contractions, it was found that in the first period of birth, a significant increase in the dynamics of uterine contractions until the opening of the uterine 5-7 cm ( $p < 0,05$ ).

In the second stage of labor, the rate of uterine contractions is practically no different from the opening of the uterine of 8-10 cm in the first stage of birth ( $p > 0,05$ ).

When analyzing the indicators of uterine ejaculation activity, it was found that in the first period of birth until the opening of the uterine 5-7 cm, a statistically significant increase in uterine ejaculation was observed ( $p < 0,05$ ).

At 8-10 cm of uterine opening and in the second stage of childbirth, uterine discharge rates are practically indistinguishable ( $p > 0,05$ ).

Another indicator of uterine cumulative activity is the total duration of contractions. In women with mild preeclampsia, a significant increase in these values is observed before the second stage of labor ( $p < 0,05$ ). In the second stage of labor, the total duration of labor is practically unchanged ( $p > 0,05$ ).

By determining the interval of contractions during childbirth, it was determined that the interval between contractions before the opening of the uterine of 5-7 cm is significantly reduced, the opening of the uterine cavity is 8-10 cm and during the second period of birth these indicators do not change ( $p > 0,05$ ).

When analyzing the number of contractions for 10 minutes, it was found that women with mild preeclampsia had a significant increase in the number of contractions during the first period of labor until the opening of the uterine 5-7 cm, and after this period no changes were observed ( $p > 0,05$ ).

When examining the indicators of the duration of the uterine cycle, it was found that in the dynamics of the first period of birth there was a statistically significant opening of the uterine hole 5-7 cm and a significant decrease in the uterine cycle in the second period of birth ( $p < 0,05$ ).

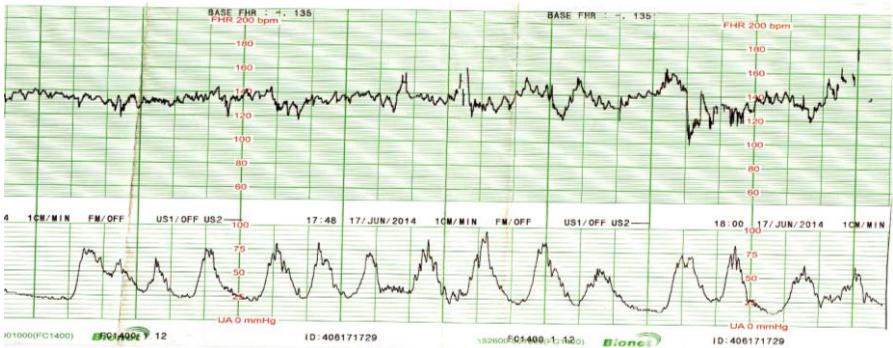
Although the ratio of uterine contractions to discharge (K1) and the ratio of uterine contractions to total contractions (K2) increased in the dynamics of labor, no statistically significant difference was found between the indicators ( $p > 0,05$ ).

It should be noted that in women with mild preeclampsia, uterine cumulative activity is significantly increased by the Montevideo unit until the second stage of birth, and practically does not change in the second stage of birth.

Thus, the study of uterine activity in women with mild preeclampsia by intrapartum cardiotocography revealed a significant increase in the intensity of labor in the dynamics of childbirth, and a statistically significant increase in uterine contractions and the total duration of labor until the second stage of labor. It was found that the activity of the uterus is manifested by a statistically significant

increase in births in the I and II periods of the Alexandria unit<sup>6</sup>.

Examples of intrapartum cardiotocography during childbirth are presented in Figures 1 and 2.



**Figure 1. 39-40 weeks of pregnancy. I period of birth (active phase). 5 cm opening of the uterine cavity, 5 contractions in 10 minutes. Fetal heart rate 126-160 beats per minute**



**Figure 2. 40 weeks of pregnancy. Mild preeclampsia. I period of birth. 8-9 cm opening of the uterine cavity. Regular delivery, 10 minutes. The presence of 4 contractions during the period, the intensity of contractions is 75-95 mm Hg Fetal heart rate 130-155 beats per minute**

The duration of labor in women with mild preeclampsia is given in Table 2.

<sup>6</sup>Аббасова, Н.В. Особенности сократительной деятельности матки при спонтанных родах у первородящих / Н.В.Аббасова, Э.М.Алиева, В.А.Ахмедзаде [и др.] // – Киев: Здоровье женщины, – 2017. №4 (120), – с. 69-72.

**Table 2**

**Duration of labor in women with mild preeclampsia (M±Se)**  
**(n=97)**

Periods of birth	In women with mild preeclampsia	Births without anomalies of labor	p
I period, hour:	8,33±0,24 (1-14,3)	10,41±0,34 (1,4-13)	<0,05
– latent phase	1,24±0,11 (1-3)	3,18±0,31 (3-7)	<0,05
– active phase	7,09±0,22 (3-10)	7,23±0,36 (3-11)	>0,05
II period, minute	32,21±1,76 (1-50)	27,95±0,84 (10,0-50,0)	>0,05
III period, minute	7,22±0,34 (5-15)	6,0±0,29 (3-10)	>0,05
Total duration, hour	9,12±0,22 (5,4-14,5)	11,24±0,21	<0,05

*Note: p – honesty coefficient*

Thus, when analyzing the dynamics of childbirth in women with mild preeclampsia, it was found that the intensity of contractions at the beginning of labor is high, the activity of the uterus is high in the Alexandria unit, the interval between contractions, and the duration of the uterine cycle is statistically low. The results show that in women with mild preeclampsia, there is a high level of uterine contraction activity in the latent phase of childbirth, which results in a significant reduction in the duration of the latent phase<sup>7</sup>.

It was found that in women with mild preeclampsia, there is a statistically significant reduction in the total duration of labor, which is due to a significant reduction in the latent phase of period I.

### **Determination of the condition of the fetus during pregnancy and the dynamics of spontaneous birth in women with mild preeclampsia**

In all women with mild preeclampsia, an external CTG scan was performed at 38 to 40 weeks of gestation to determine fetal status and uterine cumulative activity.

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<sup>7</sup>*Abbasova, N.V., Əliyeva, E.M. Yüngül preeklampsiya olan qadınlarda spontan doğuşlardan qabaq və doğuşların dinamikasında dölün vəziyyətinin xüsusiyyətləri // – Bakı: Sağlamlıq, – 2018. №1. – s.71-78.*

According to the results of CTG examination, the condition of the fetus was normal in 34 (35%) pregnancies, early signs of intrauterine hypoxia in 52 (53,6%) pregnant women, and noticeable signs of chronic fetal hypoxia in 11 (11,3%). In these pregnant women, a decrease in the total number of slow accelerations and an increase in the total duration of a stable rhythm were noted.

It was determined that the condition of the fetus was normal in 34 (35%) pregnancies, and the condition of the fetus was  $0,89 \pm 0,3$  according to В.Н.Демидова. Early signs of intrauterine hypoxia in 52 (53,6%) pregnancies and the condition of the fetus was  $1,4 \pm 0,2$ . Significant signs of fetal hypoxia in 11 (11,3%) pregnant women with preeclampsia were  $2,7 \pm 0,01$ .

Thus, 64,9% of pregnant women with mild preeclampsia showed signs of chronic fetal hypoxia. These pregnant women were hospitalized in the pathology department at 38-39 weeks of gestation and underwent pathogenetic treatment for 5-7 days, taking into account the clinical signs of fetoplacental insufficiency on the background of mild preeclampsia. This pathogenetic treatment was given for the treatment of mild preeclampsia, fetoplacental insufficiency, and major somatic diseases, including anemia, asymptomatic bacteriuria.

After pathogenetic treatment, the fetal condition was normal in 74 (76,3%) of 97 patients with mild preeclampsia. In 23 (23,7%) mild signs of fetal hypoxia were note.

In women with mild preeclampsia, the condition of the fetus during childbirth was assessed by intrapartum cardiotocography. Newborns were  $7,3 \pm 0,14$  (1-9) on the 1st minute and  $8,25 \pm 0,09$  (4-10) on the 5th minute according to the Apgar scale. As a result of the birth, it was determined that 78 (80,4%) were born in satisfactory condition, and 19 (19,6%) were diagnosed with acute fetal hypoxia at the end of chronic fetal hypoxia..

Causes of acute fetal hypoxia:

- absolute shortness of the umbilical cord – 5 (5,2%);
- circumference of the umbilical cord to the neck of the fetus or other parts of the body at 9 (9,3%);
- as a result of hyperstimulation of labor - in 2 (2,1%);

- true knot of the umbilical cord in 1 (1%);
- sharp edge of the umbilical cord in the placenta was in – 2 (2,1%).

### **Changes in enzymatic activity in the dynamics of the birth process in women with mild preeclampsia**

The study studied the changes in liver enzymes alanine aminotransferase (ALT), aspartate aminotransferase, lactate dehydrogenase, alkaline phosphatase (ALP) in women with mild preeclampsia.

Enzyme levels in women with mild preeclampsia were compared with those in spontaneous uncomplicated births. In the dynamics of childbirth in women with mild preeclampsia, ALT (I period  $13,6 \pm 1,62$  u/l, III period  $14,19 \pm 1,29$  u/l), AST (I period  $22,5 \pm 1,128$  u/l, III period  $24,59 \pm 1,91$  u/l), LDH (I period  $225,46 \pm 10,16$  u/l, III period  $245,19 \pm 14,0$  u/l), ALP (I period  $203,19 \pm 12,8$  u/l, II period  $220,16 \pm 11,6$  u/l, III period  $228,9 \pm 15,41$  u/l), do not differ from the indicators of spontaneous births. ALP was statistically higher in women with mild preeclampsia than in those with spontaneous births.

Thus, a significant increase in the enzyme ALP is observed in the dynamics of childbirth in women with preeclampsia ( $p < 0,05$ ).

### **The importance of electrolytes in childbirth in women with mild preeclampsia**

The study determined the amount of sodium ( $\text{Na}^+$ ), potassium ( $\text{K}^+$ ), calcium ( $\text{Ca}^{++}$ ), chlorine ( $\text{Cl}^-$ ) ions in the first, second and third stages of childbirth in women with mild preeclampsia. The values of these electrolytes are shown in Table 3.

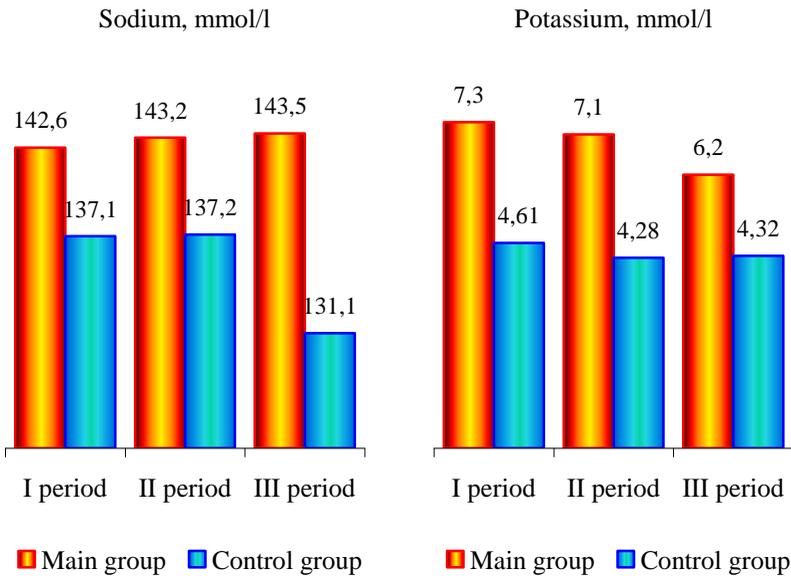
Electrolyte levels were virtually unchanged in women with mild preeclampsia ( $p > 0,05$ ).

The dynamics of childbirth in women with mild preeclampsia show statistically high levels of sodium and potassium electrolytes compared to spontaneous uncomplicated births (Chart 1). The

amount of calcium ions does not differ from similar indicators of spontaneous births.

**Table 3**  
**Electrolyte levels in women with mild preeclampsia (M±Se)**

Indicators (n=82)	Periods of birth			p
	I period	II period	III period	
Sodium, mmol/L	142,58±0,55	143,2±0,43	143,46±0,49	>0,05
Potassium, mmol/L	7,33±0,6	7,05±0,11	6,15±0,17	>0,05
Calcium, mmol/L	1,1±0,01	1,2±0,02	1,21±0,01	>0,05
Chlorine	104,1±0,21		102,78±0,16	>0,05



**Chart 1. Comparative indicators of sodium and potassium electrolytes in the dynamics of birth**

Thus, although the amount of Na<sup>+</sup>, K<sup>+</sup>, Ca<sup>++</sup>, Cl<sup>-</sup> in the dynamics of childbirth in women with mild preeclampsia remains practically

the same, it is noted that  $\text{Na}^+$ ,  $\text{K}^+$  ions are statistically significantly higher at birth compared to spontaneous births ( $p < 0,05$ ).

### **Characteristics of changes in oxygen transport and acid-base status of blood in the dynamics of childbirth in women with mild preeclampsia**

In the study, the partial pressure of oxygen in women with mild preeclampsia practically does not change in the dynamics of childbirth.

When analyzing the indicator of oxygen saturation (saturation) of the blood, it was determined that this indicator is a statistically significant increase in the second period of birth, and does not change in the third period.

Thus, in women with mild preeclampsia, saturation at birth is lower than in oxygen transport in the first period, and a statistically significant increase in the second period (cumle aydın deyil).

Oxygen transport rates of women with mild preeclampsia during childbirth were compared with those of spontaneous uncomplicated births.

Births of women with mild preeclampsia were found to have statistically significantly lower levels of saturation and hemoglobin in the first period, indicating that births of women in this contingent were on the background of hypoxemia. An increase in saturation is detected in the dynamics of births ( $p > 0,05$ ).

The hemoglobin index is significantly lower than that of spontaneous uncomplicated births ( $p < 0,05$ ).

Thus, in women with mild preeclampsia, oxygen saturation of the blood, which reflects oxygen transport during the first period of life, and statistically low hemoglobin are noted. This reflects the onset of labor activity against the background of hypoxemia.

The study studied the acid-base status of the blood in the dynamics of the birth process in women examined.

In women with mild preeclampsia, pH,  $\text{pCO}_2$ , and  $\text{TCO}_2$  levels are statistically low in the first trimester, and a significant increase in the second trimester.

It has been established that women with mild preeclampsia have a statistically significant decrease in pH compared with spontaneous uncomplicated births ( $p < 0,05$ ).

It is determined that the pH level is practically unchanged in the second and third stages of birth ( $p > 0,05$ ).

It should be noted that in women with mild preeclampsia, the partial values of carbon dioxide in the blood ( $p\text{CO}_2$ ), plasma bicarbonates ( $\text{HCO}_3$ ), and blood base deficits (ABE; CBE) did not differ from those in spontaneous births ( $p > 0,05$ ).

The total amount of carbon dioxide ( $\text{TCO}_2$ ) in the blood plasma of postpartum women was significantly higher in the third trimester ( $P < 0,05$ ).

Thus, women with mild preeclampsia have statistically significantly lower pH than spontaneous uncomplicated births. This reflects the fact that in women with mild preeclampsia, labor activity is against the background of hypoxia<sup>8</sup>.

### **Features of changes in the level of oxygen transport, the acid-base status of the blood in the umbilical cord of newborns to women with mild preeclampsia**

In the study, 97 newborns were born to women with mild preeclampsia. The mean weight of newborns fluctuated between  $3413,28 \pm 42,249$  grams.

The incidence of neonates born in the large fetuses was 10,3% (10).

The height of the fetuses was  $51,41 \pm 0,21$  cm. According to the Apgar scale, newborns scored  $7,3 \pm 0,14$  (1-9) points in the 1st minute and  $8,25 \pm 0,09$  (4-10) points in the 5th minute.

As can be seen from table 4, the values of oxygen transport in the umbilical cord of neonates born to women with mild preeclampsia did not differ from those obtained from the umbilical cord of

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<sup>8</sup>*Ağakişiyeva, L.Q.* Spontan doğuşların dinamikasında oksigen nəqliyyatının qadın turşu-qələvi vəziyyətinin və bəzi elektrolitlərin dəyişmə xüsusiyyətləri / *L.Q.Ağakişiyeva, E.M.Əliyeva, M.A.Qaraşova, N.V.Abbasova* // – Bakı: Azərbaycan Təbabətinin Müasir Nailiyyətləri, – 2015. №1. – s. 205-208.

newborns born spontaneously. Ph  $7,02 \pm 0,02$  at the umbilical cord of newborns from the main group of women was a statistically significantly lower.

**Table 4**

**Comparative indicators of oxygen transport in the blood taken from the umbilical cord (M±Se)**

Indicators (n=82)	In the umbilical cord of neonates born to women with mild preeclampsia	In the umbilical cord of neonates born from spontaneous complications	p
pO <sub>2</sub> , mmHg	24,19±1,88	24,92±1,83	>0,05
SO <sub>2</sub> (saturation)%	40,11±4,3	38,1±4,72	>0,05
Hb/g/L	151,0±0,23	154,0±0,66	>0,05

Other indicators of acid-base status, including the partial pressure of carbon dioxide pCO<sub>2</sub> ( $44,58 \pm 3,54$ ), HCO<sub>3</sub> of bicarbonates in blood plasma ( $20,64 \pm 0,32$ ), the total amount of carbon dioxide TCO<sub>3</sub> ( $21,9 \pm 0,033$ ) practically do not change<sup>9</sup>.

Thus, the condition of newborns in women with mild preeclampsia depends on the duration of mild preeclampsia, pathogenetic treatment, frequency of chronic fetal hypoxia during pregnancy, and various causes of acute fetal hypoxia at birth, including absolute and relatively short umbilical cord, and postpartum of hyperstimulation.

## FINDINGS

1. According to retrospective material, in 87,1% of women with mild preeclampsia, labor was uncomplicated, in 12,9% there was the weakness of the first contraction (5,9%), premature ejaculation (5%), hypotonic bleeding (2 %) is appointed. 21,8% of spontaneous births are premature. The duration of the first period was  $7,4 \pm 0,16$  hours,

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<sup>9</sup>Аббасова, Н.В., Алиева, Э.М., Агакишиева, Л.Г. Особенности изменения транспорта кислорода и кислотно-основного состояния крови в динамике родового процесса у рожениц с легкой степенью преэклампсии // Медицинские новости, – 2017. №11 (278). – с.57-60.

the duration of the second period was  $28,8 \pm 0,31$  minutes, the duration of the third period was  $8,2 \pm 0,28$  minutes, and the total duration of the birth was  $7,51 \pm 0,17$  hours. is. Of the neonates born to women with mild preeclampsia, 13,9% had a large fetus, 96% were in a satisfactory condition, and 4% were in a moderate condition [2].

2. According to the prospective material, against the background of mild preeclampsia at 38-40 weeks of gestation, 79,4% of women have a mature cervix, regarding M.S.Brunchill scale –  $6,1 \pm 0,2$  points, and while 20,6% - incomplete regarding M.S.Brunchill scale was  $3,2 \pm 0,3$  points. Early signs of chronic intrauterine fetal hypoxia are detected in 53,6% of pregnant women, noticeable signs of chronic hypoxia in 11,3%, anemia in 9,3%, and polycystic ovary syndrome in 3,1%. Clinical signs of mild preeclampsia include systolic blood pressure  $142,2 \pm 0,69$  mm Hg, diastolic blood pressure  $96,13 \pm 0,6$  mm Hg, proteinuria  $0,33 \pm 0,03$  g/L. High-frequency hypoproteinemia ( $59,3 \pm 0,35$  g/L) and anemia (Hb  $107,24 \pm 1,3$  g/L) are observed in these pregnant women [2].

3. In women with mild preeclampsia, the intensity of contractions in the latent phase of labor ( $43,78 \pm 2,32$  mm Hg), uterine contractions ( $28,32 \pm 1,1$  seconds), uterine discharge ( $43,44 \pm 1,46$  seconds) , the total duration of contractions ( $71,76 \pm 1,27$  seconds), the statistically significant increase in uterine activity in Alexandria units ( $3372,9 \pm 82,2$ ), the duration of the interval of contractions ( $94,79 \pm 9,38$  seconds), and the total duration of the uterine cycle ( $166,55 \pm 0,28$  sec) was significantly lower. The duration of the latent phase of the first period of labor . is appointed  $1,24 \pm 0,11$  hours, the duration of the active phase is  $7,09 \pm 0,22$  hours, the duration of the second phase of labor is  $32,21 \pm 1,76$  minutes, the duration of the third period is  $7,22 \pm 0,34$  minutes. The total duration of labor is  $9,12 \pm 0,22$  hours [4].

4. 76,3% of women with mild preeclampsia sufficient conditions in the mother's womb before birth, and 23,7% have chronic fetal hypoxia. 97,9% of births are uncomplicated, and 2,1% have secondary cramps. As a result of the birth process, 80,4% of the fetus is born in sufficient condition, and 19,6% of the fetus is born in acute hypoxia. Causes of acute fetal hypoxia include umbilical cord

entrapment in the neck and other parts of the fetus in 9,3%, absolute shortness of the umbilical cord in 5,2%, hyperstimulation of labor in 2,1%, true knot of the umbilical cord in 1%, in 2,1%, a sharp edge of the umbilical cord was observed in the placenta [6].

5. Alkaline phosphatase in women with mild preeclampsia:

In the first period –  $203,19 \pm 12,8$  u/l;  $220,16 \pm 11,6$  u/l in the second period;  $228,9 \pm 15,41$  u/l in the III period, sodium ions:  $142,58 \pm 0,55$  mmol/L in the I period;  $143,2 \pm 0,43$  mmol/L in the second period;  $143,46 \pm 0,49$  mmol/L in the third period, potassium ions:  $7.33 \pm 0.6$  mmol/L in the first period;  $7.05 \pm 0.11$  mmol/L in the second period; In the third period, a statistically high level of  $6.15 \pm 0.17$  mmol/L was noted [5, 8].

6. I period of childbirth in women with mild preeclampsia oxygen saturation of the blood is  $94,4 \pm 0,22\%$ , hemoglobin is  $107,24 \pm 1,3$  g/L, and pH is  $6,96 \pm 0,06$  is determined to be statistically low and this reflects the course of childbirth in women with mild preeclampsia against the background of hypoxemia [1].

## **PRACTICAL RECOMMENDATIONS**

1. The course of mild preeclampsia depends on the attendance, duration of the hestation, timely medical correction. It is necessary to assess the prenatal maturity of the cervix, the condition of the fetus in the womb, the accumulation activity of the uterus in the last weeks of gestation in these pregnant women.

2. In women with mild preeclampsia, prompt and rapid delivery is compensatory and does not affect the condition of the mother, fetus, and newborn.

3. In women with mild preeclampsia, delivery should be performed under the supervision of an external cardiotocography method, and it is advisable to determine the dynamics of oxygen transport and acid-base in the dynamics of labor before delivery.

4. High levels of the enzyme alkaline phosphatase,  $\text{Na}^+$ ,  $\text{K}^+$  ions in the last weeks of pregnancy and the dynamics of childbirth in women with mild preeclampsia indicate the activity of metabolic processes.

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## LIST OF ABBREVIATIONS

B/P	– blood pressure
ABE, CBE	– deficiency of blood basics
ALT	– alanine aminotransferase
AST	– aspartate aminotransferase
Ca <sup>++</sup>	– calcium
Cl	– chlorine
CPK	– creatine phosphokinase
BMI	– body mass index
DVG	– dölün vəziyyətinin göstəricisi
Glc	– glucose
Hb	– hemoglobin
HCO <sub>3</sub>	– the amount of bicarbonates in the blood plasma
K <sup>+</sup>	– potassium
CTG	– cardiotocography
ALP	– alkaline phosphatase
Lac	– lactate
LDH	– lactate dehydrogenase
Na <sup>+</sup>	– sodium
pCO <sub>2</sub>	– partial pressure of carbon dioxide in the blood
pO <sub>2</sub>	– partial pressure of oxygen in the blood
TCO <sub>2</sub>	– total amount of carbon dioxide in blood plasma



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