

## THE ROLE OF HEMOSTATIC SYSTEM INDICATORS IN PREDICTING OBSTETRIC BLEEDING

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**Key words:** physiological pregnancy, D-dimer, fibrinolysis, hemostasiologic.

**Таянч сўзлар:** физиологик ҳомиладорлик, Д-димер, фибринолиз, гемостазиологик.

**Ключевые слова:** физиологическая беременность, D-димер, фибринолиз, гемостазиологический.

The purpose of the study: to evaluate the state of hem coagulation with its physiological course for predicting the risk of obstetric hemorrhage in terms of trimesters of pregnancy in its dynamics. Surveyed 65 women with physiological pregnancy. Of these, 30 women (group II) have risk factors; smoking patients during this pregnancy, overweight, taking oral contraceptives with the abolition of less than or 3 months before pregnancy. 35- Women without risk factors with a normal pregnancy. Clinical and hemostasiologic studies were performed for periods of 10–12, 22–24, and 35–36 weeks of gestation. During gestation, there was an increase in spontaneous platelets, an increase in fibrinogen level, D-dimer, and a slowdown in fibrinolysis.

## АКУШЕРЛИК ҚОН КЕТИШИНИ БАШОРАТЛАШДА ГЕМОСТАЗ КЎРСАТКИЧЛАРИНИНГ АҲАМИЯТИ

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Тадқиқот мақсади: ҳомиладорлиги физиологик кечаётган аёлларда динамикада акушерлик қон кетиши хавфини башорат қилиш, учун қон ивишининг ҳолатини баҳолашдан иборат. Ҳомиладорлиги физиологик кечаётган 65 нафар аёл ўртасида текширув ўтказилди. Улардан 30 нафар аёл (II гуруҳ) хавф омиллари эга; ҳомиладорлик пайтида чекадиган, ортикча вазнга эга бўлган, ҳомиладорликдан 3 ой олдин ёки ундан 3 ой олдин контрацептив воситаларни қабул қилган аёллар. 35 - нафар эса хавф омиллари бўлмаган ҳомиладор аёллар олинди. Клиник ва гемостазиологик тадқиқотлар ҳомиладорликнинг 10–12, 22–24 ва 35–36 ҳафталаарида ўтказилди. Ҳомиладорлик пайтида ўз-ўзидан пайдо бўлган тромбоцитларнинг кўпайиши, фибриноген даражасининг ошиши, Д-димер ва фибринолизнинг секинлашиши кузатилди.

## РОЛЬ ПОКАЗАТЕЛЕЙ СИСТЕМЫ ГЕМОСТАЗА В ПРОГНОЗИРОВАНИИ АКУШЕРСКИХ КРОВОТЕЧЕНИЙ

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Цель исследования: оценить состояние гемокоагуляции с ее физиологическим течением для прогнозирования риска возникновения акушерских кровотечений в условиях триместра беременности в его динамике. Обследовано 65 женщин с физиологической беременностью. Из них 30 женщин (группа II) имеют факторы риска; Курящие пациенты во время этой беременности имеют избыточный вес, принимают оральные контрацептивы с отменой менее чем за 3 месяца до беременности. 35- Женщины без факторов риска с нормальной беременностью. Клинические и гемостазиологические исследования проводились в течение 10–12, 22–24 и 35–36 недель беременности. Во время беременности наблюдалось увеличение спонтанных тромбоцитов, повышение уровня фибриногена, D-димера и замедление фибринолиза.

Obstetric hemorrhages are the leading cause of maternal mortality in most countries of the world, including our Republic of Uzbekistan. The frequency of obstetric bleeding with blood loss of more than 1000 ml is from 2 to 8% in relation to the total number of births. Massive bleeding due to a combination of several causes and almost always accompanied by gross violations of the hem coagulation system [1,3,6].

Bleeding as the cause of maternal and prenatal mortality during pregnancy, in childbirth and the postpartum period continues to be one of the urgent problems of modern obstetrics, being in 20–28% of cases the only cause of deaths for the mother and fetus [4,5].

Massive bleeding may be due to a number of reasons and more often their combination. A practical doctor is not always in the state of the variety of them to distinguish leading and implement the most rational prevention and therapy. The difficulty of real and differentiated prevention of massive blood loss is due to several factors, one of the main factors being the presence of physi-

ological hyper coagulation, as the “pregnancy rate” [2,9,10].

However, the prognostic criteria for hemostatic system impairment resulting in massive obstetric bleeding remain deeply unexplored. Changes in the hemostatic system of a pregnant woman are physiological and are associated with the appearance of the uteroplacental circulation. This process is due to various factors and is an adaptive response of the pregnant woman's body to compensation of costs due to the development of the fetus and possible blood loss during childbirth.

An important indicator to characterize the degree of hemostasis activation is the level of D-dimer. With fibrin cleavage, the final products are formed D-dimers. In healthy people, the concentration of D-dimer does not exceed 500 mg / ml FEV (units equivalent of fibrinogen). An excess of D-dimer indicates activation of fibrinolysis and an increase in the formation of thrombin [7,8,10].

During normal pregnancy, the level of D-dimer in the blood plasma gradually increases several times, reaching its peak by the first day of the postpartum period.

Excessive increase in D-dimer is considered evidence of the unfavorable course of pregnancy and labor associated with impairment in the hemostasis system, including the development of the risk of massive obstetric hemorrhage [8,9].

**The study's purpose:** to evaluate the state of hemocoagulation with its physiological course for predicting the risk of obstetric hemorrhage in terms of trimesters of pregnancy in its dynamics.

**Material and methods.** The study involved 65 women with physiological pregnancy. Of these, 30 women (group II) have risk factors; smoking patients during this pregnancy, overweight, taking oral contraceptives with the abolition of less than or 3 months before pregnancy. 35- Women without risk factors with a normal pregnancy. Clinical and hemostasiologic studies were performed for periods of 10–12, 22–24, and 35–36 weeks of gestation. Clinical examination included analysis of complaints, history taking, physical examination, analysis of medical records. Blood for hemostasiological research was taken in the morning, on an empty stomach, from the cubital vein, using a needle with a wide lumen. The study was carried out for 2 hours from the moment the plasma was obtained on the “Biologist 2A-230-2” apparatus. Coagulation studies were performed using the “Technology – Standard” reagents on a Diamed-CD-4 semi-automatic coagulometer. Investigated activated plasma recalcification time (APR), activated partial prothromboplastin time (APTT), prothrombin time (PT), fibrinogen level. Statistical processing of the results was carried out using Student's criterion using the Statgraf and Microsoft Excel versions of the Windows software package.

**Results and discussion.** According to the inclusion criterion, 65 women were examined. The average age of the patient is 25 (22-30) years. Of these, 30 had the first birth, 35 - repeated. None of the patients before the survey did not receive anti-thrombotic therapy. The dynamics of hemostasis are presented in the table below.

When analyzing the results obtained in the table it should be noted that, APR, APTT, PT did not have dynamic static differences in trimesters. At the same time, an increase in PV by the end of pregnancy turned out to be statically significant compared with rates in the first and second trimesters. Since this test reflects the total antithrombin plasma activity, it is possible that the increase is due to an increase in the level of paracoagulation products, which have an anticoagulant effect.

When analyzing the number of platelets, we found no statistical differences with a slight decrease in mean values in the third trimester, which can be explained by both relative hemodilution and partial physiological consumption of platelets in the uteroplacental circulation.

It is noteworthy that there is an increase in the level of fibrinogen during pregnancy, which is 39.4% out of the normal range by the end of pregnancy compared with the first trimester. In parallel with hyperfibrinogenemia, there was a threefold increase in the content of D-dimer, respectively.

A comparative analysis of these parameters in the studied patients of groups I and II revealed a 3.7% increase in the number of platelets, ABP decreased by 3.8%, APTT decreased by 3.6%, PT

Table 1.

**Comparative indicators of hemostasis physiological course of pregnancy  
and in pregnant women at risk.**

Indicator	Trimester					
	I		II		III	
	I group (n=30)	II group (n=35)	I group (n=30)	II group (n=35)	I group (n=30)	II group (n=35)
Platelet count, $10^9/L$	235±36	230±34	225±39	220±30	218±30	213±25
Spontaneous platelet aggregation, %	0.17±0.13	0.16±0.15**	0.35±0.15**	0.40±0.17**	0.34±0.14**	0.30±0.12**
APR (activated plasma recalcification time), s	56.1±5.1	55.1±4.9	57.6±5.4	58.5±5.1	56.9±5.3	54.8±5.4
APTT (activated partial thromboplastin time), s	33.8±2.6	33.6±2.8	33.3±3.0	33.1±2.9	33.3±2.8	32.1±2.9
Fibrinogen, g/l	3.8±0.6	4.1±0.5	4.2±0.5*	4.8±0.4**	5.3±1.5**	5.8±1.6
Prothrombin time, s	15.5±0.9	15.9±0.8	15.7±1.2	16.1±1.1	16.1±1.8***	17±1.6***
D-dimer, mg/ml	115±58.6	125±60.2	276.8±5.1*	301±1.2	469±77.7	540±80.5***

Note: Significance of differences ( $P < 0.05$ ) when comparing indicators: \* in I and II trimesters, \*\* - in I and III trimesters \*\*\* - in II and III trimesters.

increased by 5.6%. Indicators of D-dimers increased by 15.1% in the 3rd trimester in pregnant women with an existing risk group (Group II).

Thus, indicators of fibrinogen, D-dimer and PV can be early markers of changes in the hemostasis system in patients with risk factors even during physiological pregnancy, and they can be included in the group of pregnant women with a high risk of bleeding during childbirth. In order to prevent the expected risks that exist, it is necessary to address the issues of prenatal hospitalization, which require medical correction of hemostasis system parameters, in order to achieve a successful outcome of labor for the mother.

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