



International Science Group

ISG-KONF.COM



**INTERNATIONAL SCIENTIFIC
AND PRACTICAL CONFERENCE**

"PROSPECTS OF MODERN SCIENCE AND EDUCATION"

Stockholm, Sweden

February 7– 10, 2023

ISBN 979-8-88896-530-6

DOI 10.46299/ISG.2023.1.5

47.	Карвацка Н.С. СУТНІСТЬ, ОСОБЛИВОСТІ ТА ПРОЦЕС ФОРМУВАННЯ ЗОВНІШНЬОЕКОНОМІЧНОЇ СТРАТЕГІЇ РОЗВИТКУ ПІДПРИЄМСТВА	229
48.	Мармаза О.І., Ворона С.М. ЗАГАЛЬНІ ПОНЯТТЯ ІМІДЖОЛОГІЇ ЯК ТЕОРЕТИЧНА ОСНОВА ЕФЕКТИВНОГО УПРАВЛІННЯ ПРОЦЕСОМ ФОРМУВАННЯ ІМІДЖУ ОРГАНІЗАЦІЇ	236
49.	Розмарина А.Л., Линник О.В. СУЧАСНІ ТЕНДЕНЦІЇ РОЗВИТКУ МАРКЕТИНГУ	240
50.	Титок В.В., Ємельянова О.М. КОНТРОЛІНГ ПЕРСОНАЛУ ЯК ІНСТРУМЕНТ ФОРМУВАННЯ СТАЛОГО ПЕРСОНАЛУ В ОРГАНІЗАЦІЇ	244
51.	Черновол-Ткаченко Р. ОЦІНЮВАННЯ РІЧНОГО ПЛАНУ РОБОТИ ОРГАНІЗАЦІЇ	248
52.	Яковенко Р.В., Яблонський І.А., Базака Р.В., Пузирьов О.Л. ВИРОБНИЧА СТРУКТУРА АТ "ЕЛЬВОРТІ" В СИСТЕМІ УПРАВЛІННЯ ВПРОВАДЖЕННЯМ РОБОТИЗАЦІЇ	251
MEDICINE		
53.	Akhmedova D.I., Akhmedova N.R., Ibragimov A.A., Gazieva K.S. ANTIBODIES TO MODIFIED CITRULLINATED VIMENTIN IN JUVENILE ARTHRITIS	255
54.	Bielikova Y., Angel A. TAURINE IN BLOOD SERUM AND HEART RATE VARIABILITY IN POSTINFARCTION PATIENTS	258
55.	Djurabekova S., Salimbaeva N. RELATIONSHIP OF THE PLACENTAL GROWTH FACTOR WITH THE DEVELOPMENT OF THE SYNDROME OF RESTRICTION OF FETUS DEVELOPMENT (SRFD) IN WOMEN	263
56.	Khaldarbekova M.A., Tozaboyeva S. MODERN CONCEPTS ON THE ETIOPATOGENESIS OF JUVENILE RHEUMATOID ARTHRITIS	267

RELATIONSHIP OF THE PLACENTAL GROWTH FACTOR WITH THE DEVELOPMENT OF THE SYNDROME OF RESTRICTION OF FETUS DEVELOPMENT (SRFD) IN WOMEN

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Abstract: Fetal growth restriction syndrome (SRFD) is an urgent and complex obstetric problem. A significant number of works are devoted to the study of the dynamics of the levels of placental growth factor (PLGF) during physiological pregnancy, as well as to the study of its role in the development of such a pregnancy complication as SRFD. Its role in the pathogenesis of this complication is not entirely clear, partly due to a lack of understanding of the physiological action of placental growth factor (PLGF) in general

The study of the effect of this placental growth factor (PLGF) factor on placentation will contribute to the expansion of understanding of the pathogenesis of SRFD, will allow the development of methods for its prediction in early pregnancy, and timely start the prevention of this pregnancy complication. The described data will prove that PLGF plays a significant role in the development of SRFD and determines the degree of its severity in different trimesters of pregnancy. The dynamics of the PLGF content in the serum of peripheral venous blood during pregnancy complicated by SRFD differs from the indicators of the control group by a less pronounced increase in the concentration of PLGF with an increase in the gestational age, which may be an additional diagnostic method for the threat of the development of SRFD.

Fetal growth restriction syndrome (SRFD) is an urgent and complex obstetric problem (5,9).

According to WHO, the number of newborns with SRFD ranges from 6.5% in developed countries of Europe to 31.1% in Central Asia. In the US, SRFD occurs in 10-15% of births, with severe intranatal hypoxia observed in 30%. In Russia, this syndrome occurs in 2.4-17% (2, 7, 9).

SRFD has a large share in the structure of the causes of perinatal morbidity and mortality, reaching 40% (9).

Placental growth factor (PLGF) belongs to the vascular endothelial growth factor (VEGF) family and is predominantly expressed in the placenta. PLGF-1 and -2 are the

most common forms, and during pregnancy they are secreted in a highly correlated manner, indicating a common regulatory mechanism (3).

Circulating PIGF rises markedly during pregnancy, sourced from the placenta. The function of PIGF in the placenta is likely to promote the development and maturation of the placental vasculature (6).

In the human placenta, PIGF expression corresponds to different stages of placental development with non-branching angiogenesis of the fetoplacental circulation and maturation of the uteroplacental circulation coinciding with increased PIGF expression in later pregnancy. PIGF concentrations are low in the first trimester of uncomplicated pregnancy and increase from the 11th to the 12th week and beyond to a peak at week 30, after which they decrease. Normal PIGF concentrations depend on gestational age, with the lower limit of normal (defined as the 5th centile) ranging from a peak of approximately 141 pg/mL at approximately 30 weeks' gestation to 23 pg/mL at 18(5) gestational ages.

A significant number of works are devoted to the study of the dynamics of PLGF levels during physiological pregnancy, as well as to the study of the role of PLGF in the development of such pregnancy complications as SRFD (5,6). Its role in the pathogenesis of this complication is not entirely clear, partly due to a lack of understanding of the physiological action of PLGF in general (2).

Therefore, the study of the effect of this factor on placentation will contribute to the expansion of understanding of the pathogenesis of SRFD, will allow the development of methods for its prediction in the early stages of pregnancy, and the timely prevention of this pregnancy complication.

Purpose of the study: to determine the clinical significance of the placental growth factor study for predicting and assessing the severity of SRFD in women.

Materials and methods of research: A survey was conducted in 50 pregnant women, who were divided into two groups. Group I (control) included 25 pregnant women who were comparable with the patients of the main group in terms of the presence of major obstetric complications at the time of the examination, but who gave birth to healthy children without OCRS. Group II (main) included 25 pregnant women with SRFD.

The formation of clinical groups was carried out according to two criteria: the presence or absence of SRFD at the time of the examination (prospective study).

The degree of SRFD was determined by tables of the centile type and the mass-growth coefficient.

All women underwent a complete clinical examination, including history taking, instrumental, obstetric and conventional laboratory examination.

Determination of the content of PLGF in the serum of peripheral venous blood was assessed by the ECLIA method.

Results of the study: When assessing the content of the placental growth factor (PLGF) at different stages of pregnancy in women with SRFD, significant differences were revealed compared with the indicators of pregnant women in the control group.

In the second trimester of gestation, there was a significant decrease in the concentration of PLGF in women with SRFD compared with the control. In grade 1

SRFD, PLGF levels were significantly reduced compared to the control group. With an increase in the severity of the fetal growth restriction syndrome, there were no significant differences in PLGF levels between subgroups in women of the main and control groups.

In the third trimester of pregnancy in women of the main group, the content of PLGF was also significantly lower compared to pregnant women without SRFD, and a decrease in this indicator was observed in women of all subgroups, with SRFD of the third degree, significant differences in the indicator of the compared groups were maximum (table 1).

Table 1
Features of the content of placental growth factor in SRFD

Pregnancy period	Group of pregnant women			
	Control (n=25)	Main (n=25) Subgroups		
		I n=13	II n=10	III n=2
2nd trimester	385.4	170.2	163	156
3rd trimester	449.2	261.3	240	209

As can be seen from the data presented in the table, in the dynamics of the gestational process, which was not complicated by SRFD, there was a significant increase in the content of PLGF. A significant increase in this indicator was observed in the second trimester of gestation and reached its maximum values in the third trimester of pregnancy.

A significant increase in PLGF levels with increasing gestational age was also noted during pregnancy complicated by SRFD, however, it was less pronounced than during pregnancy without SRFD.

Conclusion: According to the described data, it can be seen that PLGF plays a significant role in the development of SRFD and determines the degree of its severity in different trimesters of pregnancy. The dynamics of the content of placental growth factor in the serum of peripheral venous blood during pregnancy complicated by SRFD differed from the indicators of the control group by a less pronounced increase in the concentration of PLGF with an increase in the gestational age, which may be an additional diagnostic method for the threat of developing SRFD.

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