

Abstract

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**FEATURES OF THE COURSE OF MULTIPLE PREGNANCY  
AGAINST THE BACKGROUND OF FETAL GROWTH  
RETARDATION**

In most European countries in recent years, the frequency of multiple births ranges from 11 to 14 per 1000. These pregnancies have a high number of complications. Perinatal mortality in multiple births is more than 6 times higher than in singleton pregnancies. Severe neurological abnormalities under the age of 1 year have from 10% to 25% of twins. According to most researchers, the main cause of perinatal losses in multiple births is deep prematurity and severe fetal growth delay. It has now been proven that placental insufficiency is the main reason of developmental delay, discordant fetal growth, antenatal death of one of the fetuses. A fetus that develops and is born in conditions of chronic placental insufficiency is more vulnerable and at high risk of developing perinatal pathology.

The purpose of the research was to study the frequency and structure of complications of the pregnancy and labor of women with multiple pregnancies, complicated uteroplacental insufficiency and fetal discordance.

The study was carried out at the city clinical maternity house during 2013–2019. The information was gathered from literature and by interviewing pregnant women with twins. 20 pregnant women (group I) with dichorionic, diamniotic twins with the presence of placental insufficiency and fetal discordance of more than 20%. Group II consisted of 20 pregnant women with twins but fetal discordance did not exceed 20%. However, the control group III consisted of 30 women without complications and ended in physiological labor. The general, somatic, obstetric and gynecological anamnesis, especially the course of pregnancy, childbirth, the state of the cervix by vaginal and ultrasound examination were studied.

The results of the study show that in the anamnesis of pregnant women with fetal discordance, take place in vitro fertilization and infections of the respiratory and urinary tract. Multiple pregnancies which were accompanied by fetal discordance exceeding 20% is accompanied by impaired uteroplacental circulation. Labor with twins complicated by impaired uteroplacental circulation occurs in a large number of complications. The results can be applied to the using various medications for the correction of disorders of the uteroplacental circulation.

**Key words:** multiple pregnancy, placental insufficiency, fetal discordance.

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**Резюме****А. Б. Сухарєв,****Т. В. Копиця,****В. І. Бойко,***Сумський державний університет, м. Суми, Україна***ОСОБЛИВОСТІ ПЕРЕБІГУ БАГАТОПЛІДНОЇ ВАГІТНОСТІ ПРИ ВИЯВЛЕННІ ЗАТРИМКИ РОСТУ ПЛОДІВ**

В більшості європейських країн за останні роки частота багатоплідних вагітностей коливається від 11 до 14 на 1000 [8]. Перинатальна смертність при багатоплідді більш ніж у 6 разів вища, ніж при одноплідній вагітності. Вивчені особливості перебігу вагітності, пологів у жінок з багатоплідною вагітністю, у яких виявлені фізіологічна і патологічна дискордантність росту плодів [9, 10, 12, 14]. Багатоплідні вагітності, які супроводжувалися дискордантністю плодів, що перевищує 20 %, характеризуються порушенням матково-плацентарного кровообігу [4, 5]. Ці вагітності протікають з великою кількістю ускладнень [11–13]. Зокрема відзначена висока частота екстрагенітальної патології та прееклампсії під час вагітності. Велика кількість жінок народжували передчасно, порівняно частіше спостерігалось передчасне відходження навколоплідних вод, слабкість пологової діяльності [1–3, 6, 7]. Майже всі жінки народжували шляхом операції кесаревого розтину.

Метою дослідження було вивчити частоту та структуру ускладнень вагітності та пологів жінок із багатоплідними вагітностями, ускладненими матково-плацентарною недостатністю та дискордантністю плода.

Дослідження проводилось у КНП "Клінічний пологовий будинок Пресвятої Діви Марії" СМР протягом 2013–2019 років. 20 вагітних (група I) з дихоріальною, діамніотичною двійнею з наявністю плацентарної недостатності та дискордантністю плоду понад 20%. II група складалася з 20 вагітних жінок, дискордантність плоду у яких не перевищував 20 %. Група III складалася з 30 жінок без ускладнень. Вивчали загальний, соматичний, акушерський та гінекологічний анамнез, особливо перебіг вагітності, пологів, стан шийки матки за допомогою вагінального та ультразвукового дослідження.

Результати дослідження показали, що в анамнезі вагітних з дискордантністю плода мають місце екстракорпоральне запліднення та інфекції дихальних та сечовивідних шляхів. Багатоплідна вагітність, яка супроводжувалася дискордантністю плоду, що перевищує 20 %, характеризувалась порушенням матково-плацентарного кровообігу. Результати можуть бути застосовані на практиці для призначення корекції порушень матково-плацентарного кровообігу у жінок з багатоплідною вагітністю, ускладненою плацентарною недостатністю.

**Ключові слова:** багатоплідна вагітність, плацентарна недостатність, дискордантність росту плодів.

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**Introduction**

The formation of placental insufficiency is a universal reaction of the fetoplacental system to various extragenital diseases and the pathological course of this pregnancy. It has now been proven that placental insufficiency is the main cause of developmental delay, discordant fetal growth,

hypoxia, antenatal death of one of the fetuses, birth trauma [4]. A fetus that develops and gives birth in conditions of chronic placental insufficiency is more vulnerable and at high risk of developing perinatal pathology [5].

**The purpose** was to study the frequency and structure of complications of the course of

pregnancy and childbirth in multiple pregnancies with varying degrees of uteroplacental insufficiency, complicated by fetal discordance.

#### Materials and research methods

The study was conducted on the basis of a city clinical maternity hospital during 2013–2019. Twenty pregnant women (group I) with dichorionic, diamniotic twins were observed. Pregnancy in women of this group proceeded with the presence of placental insufficiency and fetal discordance of more than 20%. Group II consisted of 20 pregnant women with multiple pregnancies in whom pregnancy proceeded with the presence of placental insufficiency, but fetal discordance did not exceed 20%. The control group III consisted of 30 women whose pregnancy proceeded without complications and ended in physiological labor. The general, somatic, obstetric and gynecological anamnesis, especially the course of pregnancy, childbirth, the state of the cervix by vaginal examination were studied. In addition to clinical examination methods and conventional laboratory tests, in order to assess the threat of premature termination of pregnancy, an ultrasound study was carried out. For this, a Mylab Seven ultrasound machine with a 6.5 MHz transvaginal transducer was used. We were guided by order No. 205 dated 8.04.15. "The order of providing medical assistance to women with a multiple pregnancies". During ultrasound examination, attention was paid to the number and position of fetuses, the type of placentation in pregnant women.

We used Demidov's classification of the severity of uteroplacental-fetal blood flow disorders, according to which 3 degrees of severity of hemodynamic disorders were distinguished:

1st degree (A and B) – disturbance of the uteroplacental with preserved fetal-placental blood flow and disturbance of the fetal-placental blood flow with preserved uteroplacental blood flow.

2nd degree – simultaneous disturbance of uteroplacental and fetal-placental blood flow, which does not reach critical disturbances

3rd degree – critical disorders of fetal-placental blood flow with unchanged or altered uteroplacental blood flow.

Mathematical processing of the indicators was carried out using the methods of variation statistics to compare the two populations by mean values using the Student's t test of variation statistics.

#### Research results and discussion

The average age of the examined group I was  $23.0 \pm 4.3$  years. 8 (40.0%) women were primigravida, 4 (50.0%) of them after. 12 (60.0%) – were secundigravida, 2 (17.0%) of them got pregnant after in vitro fertilization. Previous pregnancies ended in urgent singleton births. There were no cases of spontaneous or artificial termination of pregnancy. All women were followed up in the antenatal clinic with a history of uncomplicated cases of respiratory infection. There were no admissions to an obstetric hospital.

The average age of the examined group II was  $24.0 \pm 3.8$  years. 12 (60.0%) women were primigravida, 7 (35.0%) patients got pregnant after in vitro fertilization. Other women were secundigravida, 4 women got pregnant after in vitro fertilization. Previous pregnancies ended in repeated urgent labor. There were no cases of spontaneous or artificial termination of pregnancy. 12 (60.0%) women were hospitalized during pregnancy due to exacerbation of chronic renal pathology (chronic pyelonephritis, urolithiasis), as well as acute respiratory viral infections, bronchitis.

The average age of the examined group III was  $22.0 \pm 3.4$  years. Pregnancies occurred naturally. 24 (80.0%) women were primigravida, 6 (20.0%) were multigravida. Previous pregnancies ended in urgent singleton births. There were no cases of spontaneous or artificial termination of pregnancy. All women were observed in the antenatal clinic. The history of the presence of extragenital diseases is not burdened. There were no admissions to the obstetric hospital.

Studies have shown that a distinctive feature of pregnant women of groups I and II is the presence of in vitro fertilization and infections of the respiratory and urinary tract in the anamnesis.

The first degree of impairment of the uteroplacental circulation was detected in 10 (50.0%) women of the main group, 14 (70.0%) from the comparison group and in 2 (6.6%) women from the control group.

The second degree of impaired uteroplacental circulation was detected in 8 (40.0%) women of the main group, 2 (10.0%) from the comparison group. In the control group, this degree of circulatory disorders was not noted.

The third degree of impairment of the uteroplacental blood circulation was revealed only in 2 (6.6%) women of the main group; there were no such cases in the comparison group and in the control group.

Thus, all pregnant women in the main group had disorders of the uteroplacental blood circulation, and in two cases it was severe. In the comparison group, the percentage was  $80.0 \pm 9.2$ , but a mild degree of impairment prevailed.

As shown in Table 1, early toxicosis in women with multiple pregnancies with uncomplicated pregnancy in the comparative group is 2 times less common than in the main group.

**Table 1 – Complications during pregnancy in women with multiple pregnancies**

Course of pregnancies	Main group		Comparative group		Control group	
	n	%	n	%	n	%
Early gestosis	11	$60,0 \pm 11,2$	5	$25,0 \pm 9,9$	4	$13,3 \pm 6,3$
The threat of interruption in the first half	12	$60,0 \pm 11,2$	7	$35,0 \pm 10,9$	1	$3,3 \pm 3,3$
The threat of interruption in the second half	15	$75,0 \pm 9,9^*$	16	$80,0 \pm 9,2$	5	$16,7 \pm 6,9$
Polyhydramnios	8	$40,0 \pm 11,2$	4	$20,0 \pm 9,2$	2	$6,7 \pm 4,6$
Preeclampsia	17	$85,9 \pm 8,2$	7	$35,0 \pm 10,9$	-	-
Total:	20		20		30	

The frequency of hypertension disorders in pregnant women with impaired uteroplacental circulation was  $85.9\% \pm 8.2\%$ , which is higher than this indicator in the comparison and control groups ( $30.0\% \pm 8.4\%$  and 0, respectively) ( $p < 0.001$ ). In our study, the threat of termination of pregnancy in half was noted significantly more often in 12 patients of the main group and amounted to  $60.0\% \pm 11.2\%$ , which, respectively, is in 3 and 4 times higher than in the comparative and control groups, respectively  $35.0\% \pm 10.9\%$  ( $p < 0.05$ ) and  $3.3\% \pm 3.3\%$  ( $p < 0.001$ ).

Pregnant women of the main group repeatedly during pregnancy received conserving, antihypertensive therapy on an outpatient and inpatient basis.

Analysis of the course and outcome of labor in women with multiple pregnancies with uteroplacental and without uteroplacental insufficiency shows a decrease in the frequency of urgent labor, an increase in untimely discharge of water, weakness of labor, cesarean section (Table 2).

**Table 2 – Labor outcomes in women with multiple pregnancies**

Labor outcomes	Main group		Comparative group група		Control group	
	n	%	n	%	n	%
Childbirth:						
- timely	2	$10,0 \pm 6,9$	16	$80,9 \pm 9,2$	29	$96,7 \pm 3,3$
- premature	16	$80,9 \pm 9,2$		$\pm 8,4^{\circ}$		2,0
- induced	2	$10,0 \pm 6,9$	1	$5,0 \pm 5,0$	1	$3,3 \pm 3,3$
Untimely discharge of amniotic fluid	10	$50,0 \pm 11,5$	9	$45,0 \pm 11,4$	2	$6,7 \pm 4,6$
Weakness of labor	5	$25,0 \pm 9,9$	3	$15,0 \pm 8,2$	2	$6,7 \pm 4,6$
Caesarean section	7	$35,0 \pm 10,9$	6	$30,0 \pm 10,5$	2	$6,7 \pm 4,6$
Average blood loss in ml		$356,6 \pm 17,8$		$398,4 \pm 24,6$		$215,2 \pm 10$
Total:	20	100	20	100	30	100

The average duration of the first period in women with multiple pregnancy in the main and comparative groups was  $8.0 \pm 1.0$  and  $8.4 \pm 1.3$  hours, respectively, in the control group  $8.0 \pm 0.5$  hours ( $p < 0.05$ ).

So, in 2 women in labor ( $10.0\% \pm 6.9\%$ ) of the main group and in 16 ( $80.9\% \pm 9.2\%$ ) of the comparative group, timely delivery was observed,

this was significantly lower than the indicators of the control group 29 ( $96.7\% \pm 3.3\%$ ), ( $p < 0.001$ ). In women with multiple pregnancies with uteroplacental insufficiency, a higher incidence of preterm birth was revealed compared to the comparison and control groups ( $67.9\% \pm 6.3\%$ ,  $15.0 \pm 8.2\%$  and 0%, respectively), ( $p < 0.05$ ). Among the complications of childbirth, untimely

drainage of water was most common in 10 (50.0%  $\pm$  11.5%) of the main group and in 9 (45.0%  $\pm$  11.4%) of the comparative group, which 3 and 4 times higher than in the control group.

Planned hospitalization of pregnant women with multiple pregnancies, timely prevention of bleeding with modern reducing agents made it possible to prevent the development of pathological blood loss in the early postpartum period. In three cases in the main group, a manual examination of the uterine cavity was performed in connection with a placental defect, in 2 cases in the postpartum period a hematometer was noted, and therefore an instrumental revision of the uterine cavity was performed under the control of ultrasound diagnostics. Average blood loss in labor in women in labor in the main group was 386.1 ml  $\pm$  19.8 ml, in the comparative group 378.5 ml  $\pm$  25.0 ml, and in the control group - 255.1 ml  $\pm$  18.0 ml.

Delivery by cesarean section with multiple pregnancies did not have significant differences between the main and comparative groups; 7 women in the first group (35.0%  $\pm$  10.9%) and 6 in the second group (30.0%  $\pm$  10.5%), respectively,

and in the control group only in 2 cases (6.7%  $\pm$  4.6%).

When analyzing the indications for operative delivery in the main and comparative groups, it was found that the indications were determined by the following indications: incorrect position of one of the fetuses, premature detachment of a normally located placenta, distress of one of the fetuses during pregnancy, decompensation of extragenital pathology, presence of scars on the uterus, fetal distress during childbirth.

The data obtained make it possible to reveal the presence of a connection between the appearance of fetal growth retardation in multiple pregnancies and in vitro fertilization, the presence of chronic site of infections. Pregnancy in these women was often accompanied by the threat of termination, hypertensive disorders, the presence of impaired uteroplacental circulation. Labor was complicated by weakness of labor, fetal distress. There was a high rate of caesarean section. In further research, we propose to develop an algorithm for the management of pregnant women in order to improve the results of pregnancy.

### Conclusions

1. In the history of pregnant women with impaired uteroplacental circulation and fetal discordance, in vitro fertilization and infections of the respiratory and urinary tract take place.
2. Multiple pregnancies complicated by impaired uteroplacental circulation occurs in a large number of complications

3. Multiple pregnancies which were accompanied by fetal discordance exceeding 20% is accompanied by impaired uteroplacental circulation.

4. Childbirth in multiple pregnancies complicated by impaired uteroplacental circulation occurs in a large number of complications.

### Prospects for future research

Prospects for further research are related to the study of assessing the effectiveness of using various medications for the correction of disorders of the uteroplacental circulation.

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#### Conflict of interest

The authors declare no conflict of interest.

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