



New Day in Medicine
Новый День в Медицине

NDM



TIBVIYOTDA YANGI KUN

Ilmiy referativ, marifiy-ma'naviy jurnal



ISSN 2181-712X
EISSN 2181-2187

8 (46) 2022

AVICENNA-MED.UZ



DISSOCIATED FETAL GROWTH IN MULTIPLE PREGNANCIES

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✓ *Resume*

The aim of our study was to assess the growth and development of fetuses depending on the type of chorionicity. 159 women with multiple pregnancies are divided into 3 groups depending on the type of chorionicity. The physiological development of one of the fetuses and hypotrophy of the second was revealed in the monochorionic type of placentation 55.5%, 60.3%, and in the bichorionic 35.4%. The number of children born in satisfactory conditions was higher in the group with bichorionic type of placentation. 47.5% of newborns were discharged home in satisfactory condition, 34.4% were transferred to stage nursing. Perinatal losses in-group 1 are 36.1%, in-group 2 - 26.2%, in-group 3 - 10.2%. And so, women with multiple pregnancies are at high risk of perinatal complications.

Key words: multiple pregnancy, monochorionic and bichorial type of placentation, dissociated fetal development.

ДИССОЦИИРОВАННЫЙ РОСТ ПЛОДОВ ПРИ МНОГОПЛОДНОЙ БЕРЕМЕННОСТИ

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✓ *Резюме*

Целью исследования являлась оценка роста и развития плодов при многоплодной беременности. 159 женщины с многоплодием разделены на 3 группы в зависимости от типа хориальности. Физиологическое развитие одного из плодов, и гипотрофия второго выявлены при монохориальном типе плацентации в 1 группе у 55,5%, во 2 группе у 60,3% а в 3 группе с бихориальной двойней - 35,4%. Выписаны домой в удовлетворительном состоянии 47,5% новорожденных, на II этап выхаживание переведены 34,4%. Наибольший процент перинатальных потерь было в 1 группе (36,1 %) с монохориальной моноамниотической двойней. Все женщины с многоплодной беременностью входят в группу высокого риска перинатальных осложнений.

Ключевые слова: многоплодная беременность, монохориальный и бихориальный тип плацентации, диссоциированное развитие плодов.

KO'P HOMILADORLIKDA HOMILANING DISSOTSILANGAN O'SISHI

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✓ *Резюме*

Tadqiqotimizning maqsadi horiiallik tipiga qarab homilaning o'sishi va rivojlanishini baholash edi. Ko'p homilali homilador bo'lgan 159 ayol horiiallik tipiga qarab 3 guruhga bo'lindi. Homilalardan birining fiziologik rivojlanishi va ikkinchisining gipotrofiyasi 55,5%, 60,3% monoxorial placentatsiya turida aniqlandi, bixorial turida 35,4% holatda kuzatildi. Yangi tug'ilgan chaqaloqlarning 47,5% qoniqarli holatda uyga yuborildi, 34,4% bosqichli davolashga o'tkazildi. 1 guruhda perinatal yo'qotishlar eng ko'p uchrab 36,1% tashkil etsa, 2 guruhda - 26,2%, 3 guruhda - 10,2% uchradi. Shunday qilib, ko'p homilali homiladorlik perinatal asoratlar xavfi yuqori gruppaga kiradi.

Katit so'zlar: ko'p homilali homilador ayol, monoxorionik va bixorial placentatsiya turi, homilaning dissotsiatsiyalangan rivojlanishi.

Relevance

Multiple pregnancy, in which a woman develops two or more fetuses, has been and remains one of the current problems of obstetrics. It belongs to the group of high risk of obstetric and perinatal complications. According to the WHO, the incidence of spontaneous multiple pregnancy ranges from 0.7 to 17.6%, averaging 2.2% [1, 2]. At the same time, in developed countries, this number has increased to 23-39% due to the introduction of assisted reproductive technologies. However, recent reports from the United States and the United Kingdom have demonstrated a decrease in the number of twins since 2014. MB is a risk factor not only for perinatal and neonatal complications, but also for maternal complications hypertensive disorders, premature birth, postpartum hemorrhage, which leads to increased health care costs and largely due to the high level of hospitalization of newborns [3,4].

The risk of perinatal complications such as spontaneous miscarriage, premature birth, intrauterine fetal growth retardation, antenatal death of one of the fetuses, feto-fetal transfusion syndrome in monochorionic twins is 10 to 15%, and the incidence of selective intrauterine growth retardation is up to 30%. Such neonatal complications as neurological deficits in the group of monochorionic twins account for 5-25% and in bichorionic twins - 1% [5,6].

Ultrasound is the main noninvasive, highly informative method for diagnosing MBs; it makes it possible to determine the type of chorionicity, amnionicity, and control of biometric indices for dynamic monitoring of fetal growth and development during pregnancy. In multiple pregnancies, the intrauterine growth of fetuses in the first and second trimesters can be compared with that of singleton fetuses, whereas in the third trimester (approximately after 28-30 weeks of pregnancy) growth usually decreases significantly, being an adaptive mechanism that allows increasing gestational age at birth by reducing fetal growth rate [3,6].

This proves that twins have a lower birth weight than singletons, but it is necessary to differentiate using ultrasound the growth retardation of one or both fetuses because of the high risk of perinatal complications. A recent study has shown that the growth trajectory of twins differs from that of singletons: from week 30, dichorionic twins have lower growth than singletons, and monochorionic twins tend to be smaller than dichorionic twins and singletons throughout pregnancy [7,8]. Nevertheless, current practice continues to use growth charts of monochorionic twins, which can lead to overdiagnosis of fetal/fetal delay and unnecessary iatrogenic preterm birth. Despite evidence from other studies stating that twins diagnosed with developmental delay according to the growth charts of singletons still had a higher rate of perinatal mortality than singletons, this occurred only in twins with monochorionic placentation type, but not in dichorionic twins [3,7].

One of the most common complications of multiple pregnancy is discordant fetal growth associated with delayed development of one of the fetuses. The term discordant fetal growth in multiple gestation (dissociated development) refers to the difference between the expected fetal weights exceeding 15%. According to several authors, a dissociation difference of more than 20% and 25% is a prognostic factor for perinatal complications (25) with an increased risk of morbidity (necrotizing enterocolitis, polycythemia, hypoglycemia) and mortality [9,10].

The aim of the study was to evaluate fetal growth and development in order to detect dissociation.

Materials and methods

A total of 159 women with multiple fetuses were examined and delivered in 2018-2020. All women were divided into 3 groups according to the type of chorionicity. Group 1 consisted of 17 women with monochorionic monoamniotic twins, group 2 consisted of 63 women with monochorionic diamniotic twins, and group 3 consisted of 79 women with bichorionic diamniotic twins.

Ultrasound examinations were performed abdominally using 3 to 5 MHz convex transducers on SonoScape S22 ultrasound machines. The examination included determination of fetal position in uterus, measurement of fetometric indices, evaluation of amniotic fluid, type of placentation, their localization, thickness, maturity, and structural features. An ultrasound scan measuring the biparietal size of the fetal head, abdominal circumference, femur length, and estimated fetal weight determined the fetometric parameters in relation to the estimated gestational age and the fetal growth restriction sign. Estimated fetal weight was determined automatically using the computer program of the ultrasound device based on the previously measured fetometric parameters using the Hadlock formula.

All newborns were assessed using the Apgar scale and basic indices were determined: sex, weight, height, head, chest and abdominal circumference, signs of prematurity and maturity. Perinatal complications in newborns, frequency of asphyxia at birth, hypoxic-ischemic CNS lesions, and birth trauma were considered separately.

Results and discussion

The age of the examined women was 26.3 ± 0.9 in the first group, 24.6 ± 0.7 in the second, and 27.2 ± 1.2 in the third. Of these, first-pregnant women accounted for 41.7%, 38.2%, and 32.6%, and second-pregnant women 58.8%, 61.8%, and 67.4%. The groups were comparable by social status, place of residence, and parity. Of the extragenital diseases, thyroid pathology (in the first group in 22.2%, in the second in 16.2%, in the third in 17.4%), gastrointestinal diseases (17.6%, 20.6% and 23.2%), varicose veins (22.2%, 21% and 15%), urogenital infections (29.4%, 32.3% and 14%), obesity (29.4%, 25% and 21%), anemia of varying severity were observed in every third pregnant woman. Anamnesis abortions and miscarriages occurred in 23% of the women in the first group, 25% in the second group, and 24.4% in the third group.

Literature data [1,10] show that the following types of fetal development are possible in multiple pregnancy: physiological, fetal hypotrophy and absence of dissociation, dissociated development (physiological development of one fetus and hypotrophy of the other, or both fetuses), congenital malformations of one or both fetuses, antenatal death of one or both fetuses, and fetofetal transfusion syndrome. Physiological development of fetuses was observed, in general, only in half of the women with multiple pregnancies; in the remaining cases, intrauterine retardation was observed. A dissociated type of fetal development is the most common in intrauterine retardation. Physiological development of one fetus and hypotrophy of the other fetus were observed twice as often in the dissociated type of fetal development.

Analysing the types of fetal development in 3 groups of women with multiple fetuses depending on the placentation type, we concluded the following: the physiological type of fetal development was common in women with bichoric diamniotic twins (62%), whereas in monochoric twins this type of development occurred in only one third of the women (33.3%, 30.2%, respectively). Physiological development of one of the fetuses and hypotrophy of the other prevailed in all groups. This type was most common in the monochorionic type of placentation in Group 1 - 55.5%, in Group 2 - 60.3%, while in the bichorionic bi-amniotic twin - 35.4%. A total of 47.5% of the newborns were discharged home in a satisfactory condition; 34.4% were transferred to staged nursing. Perinatal losses, including ante-, postnatal, and intrapartum death of one of the fetuses were 36.1% in group 1, 26.2% in group 2, and 10.2% in group 3.

Thus, women with multiple pregnancies, regardless of the type of placentation, were in the high risk group for perinatal complications. In intrauterine fetal retardation in women with multiple fetuses, dissociated fetal development with the predominance of physiological development of one fetus and hypotrophy of the other occurs most frequently. The most frequent dissociated type of development was observed in pregnant women with monochorionic type of placentation. Since very often in monochorionic twins one fetus is in better conditions of existence and the other less, it is explained by the presence of one placenta and worse life-supporting conditions.

The most common mode of delivery was cesarean section in group 1 in 17 (76.5%) in group 2 in 53 (77.9%) in group 3 in 63 (73.2%). The frequency of operative delivery with discordant growth was higher than that with symmetric growth. Fetal and maternal factors were indications for operative delivery. Most pregnant women were delivered prematurely before 37 weeks in the first group 88.2%, in the second group 57.3%, and in the third group 48.8%. The mean gestational age in the monochorionic type was 35.8 ± 0.5 weeks, and 37.5 ± 0.08 weeks in the dichorionic type. Analysis of neonatal body weight differed in the studied groups in the first group, the weight of the first fetus was 2328 ± 59.1 , and the weight of the second fetus was 2069 ± 82.1 . In the second group, the weight of the first fetus was 2485 ± 133.3 g, the second fetus 2368 ± 146.5 g. In the third group, the weight of the first fetus was 2884 ± 62.5 g, the weight of the second fetus was 2751.1 ± 82.2 g.

Table 1. Clinical Characteristics of Newborns

		1 group (n=17)		2 group (n=63)		3 group (n=79)	
		abc.	%	abc.	%	abc.	%
Born alive		21	61,7	93	73,8	142	89,8
Premature		15	44,1	33	24,2	28	17,7
Antenatal death of one of the fetuses		7	20,6	19	15,1	5	3,2
Postnatal death		5	14,7	10	7,9	11	7
Intrapartum loss of life		2	5,8	4	3,2	0	0
Apgar scores at 1 minute of life 8 points	8 points	4	11,1	27	21,4	63	39,8
	7 points	7	19,4	33	26,2	69	43,7
	6 points or less	16	44,5	43	34,1	21	13,3
	0 points	8	23,5	23	18,3	5	3,2

In 159 observations, pregnancy ended in live births in group 1 - 21 children (61.7%), group 2 - 93 children (73.8%), group 3 - 142 children (89.8%). Eighty-four children were born prematurely in pregnant women with the bichoric type of placentation, which was 2-3 times higher than in those with the monochoric type (Table 1).

Perinatal mortality in groups 1 and 2 was 3-fold higher than in group 3, which confirms the more adverse course and a significant number of pregnancy complications in monochorionic type placentation. Both groups 1 and 2 had a significantly higher incidence of premature births ($p < 0.05$) and, therefore, a higher number of premature babies (44.1%, 24.2%, and 17.7%, respectively, by group), which required longer observation and treatment in a hospital setting.

Apgar score of 8 points at 1 minute of life had 4 (11.1%) in the group with monochorionic monoamniotic type of placentation, 27 (21.4%) in the group with monochorionic biamniotic type, and 63 (39.8%) newborns with bichorionic biamniotic type (Table 1). As can be seen from the data presented, the number of children in group 3 with bichoric type of placentation born in satisfactory condition was significantly more, and in severe condition was significantly less compared to group 1 and 2, which had monochoric type of placentation. According to our observation, the frequency of complications during pregnancy and childbirth in women with multiple placentation had a relationship with the type of placentation.

Fetal dissociation in monochorionic twins is of particular importance. A number of authors point to the same percentage of dissociation in monochorionic and bichorionic twins, but most scientists still agree that dissociation and fetal/fetal retardation are more common in monochorionic twins, where the weight of the children is less than in bichorionic twins [6,8].

Most of the pregnant women in our study were delivered operatively by cesarean section. Other authors also found a similar percentage of operative delivery [11]. Both maternal and perinatal factors were indications for operative delivery. The high rate of emergency delivery in dissociated growth was explained by the deterioration of the fetus with growth retardation.

Comparison of the incidence of neonatal complications showed their predominance in the group with monochorionic type of placentation. Hospitalization in the newborn intensive care unit for discordant weight was 19.8%. An analysis of neonatal morbidity found a high incidence of hypoxic-ischemic CNS lesion, respiratory distress syndrome in newborns with discordant weight and it is associated with a high frequency of preterm births.

And so the growth retardation of one of the fetuses is one of the causes of perinatal morbidity. The assessment of pregnancy outcomes in women with discordant fetal growth has shown that even if the weight of twins is normal, but there is a difference in weight between them, the risk of adverse outcomes

increases. According to the recommendations (ISUOG-2016), discordance in weight of more than 25% and absence of other abnormalities suggests growth retardation of one of the fetuses.

Conclusion

The results of our study showed that discordant fetal growth occurring in the monochorionic type of placentation more often than in the bichorionic type is a risk factor for obstetric and perinatal complications. As the degree of discordance increases, the frequency and severity of fetal retardation, hypoxia and asphyxia, and CNS lesions increase. Fetal discordance of more than 20 and 25% requires more careful antenatal monitoring to decide the tactics of management and early delivery.

The obstetrician-gynecologist should consider that all women with multiple pregnancies need timely diagnosis of the type of placentation and dynamic monitoring of fetal growth and development, for timely prevention and correction of complications.

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Entered 20.07.2022