

UDC 618.33-007-02-08

PERINATAL PREGNANCY OUTCOMES IN THE INTRAUTERINE GROWTH RESTRICTION SYNDROME



Maria Korostyl,
mashakor278@gmail.com

M. Korostyl

Bogomolets National Medical University, Kyiv, Ukraine

Summary. The article contains the results of estimation of the perinatal outcomes in pregnancies with the intrauterine growth restriction syndrome (IUGRS). It was detected that early IUGRS is a prognostically unfavorable factor stipulating for the high perinatal loss percentage.

Key words: pregnancy, IUGRS, perinatal outcome.

Introduction. Intrauterine growth restriction syndrome (IUGRS) is a risk factor of unfavorable perinatal pregnancy outcome. According to various authors, the occurrence of the IUGRS makes 4–40% [1, 3, 4, 8]. The IUGRS within the perinatal mortality structure takes more than 10%, within the stillbirth figures – more than 50% [1, 7, 11]. The newborns with the IUGRS represent a heterogenic group according to the early neonatal period development and further long-term results of the child development [2].

The birth rate of children with the IUGRS is increasing [3, 6, 7]. The syndrome is particularly dangerous because almost a half of the surviving children with the IUGRS develop further severe acute and chronic diseases of various systems of organs. The syndrome consequences are observed until the child is 4-5 years old, sometimes in older children. Such children have worse anthropometric data, their mental development is retarded. There is a direct correlation between the degree of the IUGRS and the data of the physical and psychomotor development as well as the neonatal morbidity of these children. The newborns with the IUGRS are characterized by interfered temperature regulation, which provides for the hypothermia leading to high morbidity [1, 10]. The high cost of the complex treatment of children with the IUGRS considerably damages the society in social and economic aspects [4].

The IUGRS develops as a consequence of various pathological conditions which appeared during the pregnancy in a mother or fetus [7, 8, 9, 13].

In today's unfavorable demographic situation and aggravated fertile women's health condition the problem of

preserving health and life of every newborn is especially urgent. The small-for-date children must be treated with attention as they make up a risk group according to the morbidity and mortality data. This, first of all, refers to children with very small body weight, particularly to the children with extremely small body weight registered at birth, and a great part of them is represented with the premature children.

Nowadays studies of the factors causing the birth and health development of the small premature infants with the IUGRS don't provide with the sufficient information [6].

Purpose of the study was to estimate the perinatal delivery outcomes in case of restricted intrauterine growth.

Material and methods.

The study includes the data obtained from 86 pregnant women with IUGRS aged 16-37 years, who had been living in Kyiv for at least 5 years. They were referred to the clinics and delivered children on the 22nd-36th weeks of gestation. The criteria for selecting the patients into the study group were: singleton pregnancy, IUGRS confirmed after the delivery, patients' height higher than 160cm. The study doesn't contain the figures of the patients with extragenital pathology and multiple pregnancy. All the patient signed an informed consent of their participation in the study.

The study included analysis of the somatic (age, extragenital pathology), obstetrical (number of deliveries, number of natural and artificial abortions) and gynecological (menstrual function pattern, gynecological diseases in history) anamnesis. The study of the pregnancy development included estimation of obstetrical complications, the terms of their appearance, severity of the development.

The fetal state was studied using the ultrasound fetometry, dopplerometry of the "mother-placenta-fetus" vascular system, and dynamic cardiocography. Using to the expanded ultrasound fetometry data, the computer program helped to detect the gestational term, correspondence of the ultrasound parameters of the fetus to the suspected pregnancy term and, the fetal IUGRS with detecting its severity.

The ultrasound placentography included detecting the placenta localization, measuring the width, detecting its maturity and estimation of its structural changes. The estimation of the amniotic fluids amount was performed based on measuring the largest vertical size of the pocket of fluid.

In dopplerometry the study of the circulation speed performance curve included the data of the uterine arteries, umbilical arteries and fetal medial cerebral artery. The following qualitative figures were detected: systolic-diastolic ratio, resistance index and pulsation index, the last study was performed not later than 24 hours before the delivery.

To estimate the hemodynamic interference the classification of A. Strizhakov, modified by O. Ozerova was used [2].

The analysis of pregnancy outcome included the following: the term of delivery (mature or premature), method of delivery (natural delivery or the Caesarian section). The newborn's condition was estimated using the Apgar and Silverman score (in premature delivery), his body mass, length, circumference of the head and thorax were measured.

The obtained data were handled considering the mathematical and statistical analysis data, specifying the average ($M \pm m$), Student T-test and the certainty factor, using the «Excel 7,0 for Windows XP» program. The statistically significant data were analyzed at $p < 0,05$.

Results and discussion.

The average age of the examined patients is $26,7 \pm 1,2$ years. 57 women (66.3%) had regular and normal menstrual cycle. The gynecological pathology in anamnesis was detected in 34 (39,5%) as follows: lutein stage insufficiency – in 11 (32,4%), uterine leiomyoma – in 6 (17,6%), cervical dysplasia – in 8 (23,5%), bacterial vaginosis – in 9 (26,5%).

The number of primigravida was 22 (25,6%), 64 (74,4%) of the group were multigravida. In the multigravida group 21 of them (32,8 %) delivered children, 12 (18,8 %) experienced abortion, 31 (48,4%) experienced abortion and delivery. The outcomes of previous pregnancies are represented in table 1.

The complicated development of previous pregnancies (threatened miscarriage, anemia, threatened premature delivery, preeclampsia, gestational pyelonephritis, placental dysfunction, fetal distress) was noted in 31 (48,4%) women of the multigravida group. The previous pregnancy weren't characterized with the IUGRS cases.

18 patients (34.6%) had complications during the previous delivery (premature discharge of amniotic fluid, delivery abnormalities, premature abruption of normal placenta, uterine hypotonus). 10 of them (19.2%) delivered babies through the operative procedures (Caesarian section, obstetrical forceps, vacuum extraction).

The cases of pregnancy before the 22 weeks term complicated with the threatened miscarriage in 26 (30.2%) of them, with early toxicosis – in 13 (15.1%).

To specify the perinatal outcomes pattern the patients were examined according to the gestation term when the IUGRP was first diagnosed: 22-28,6 weeks, in 24 (25,6%) – subgroup 1, 29-32, 6 weeks, in 29 (33,7%) – subgroup 2, 33-36, 6 weeks – in 33 (38,4%) – subgroup 3.

The complex examination in the subgroups detected the IUGRS of various severity (tab. 2).

Table 1.

Outcomes of previous pregnancies in the examined patients, abs.,%

Multigravida n = 64	Delivery-21		Abortion-12		Delivery+abortion -31			
	PD	UD	NA	AA	PD	UD	NA	AA
	3	18	4	8	6	25	6	8
	14,3	85,7	33,3	66,7	19,4	80,6	19,4	25,8

Note: PD-premature delivery, UD-urgent delivery, NA-natural abortion, AA-artificial abortion

Table 2.

Distribution of the pregnant women according to the IUGRS degrees depending on the gestation term, abs.,%

IUGRS degree	22-28,6 weeks	29 – 32,6 weeks	33-36,6 weeks
	n 24	n 29	n 33
I degree	13 – 54,2	17 – 58,6	18 – 54,5
II degree	7 – 29,2	10 – 34,5	11 – 33,3
III degree	4 – 16,7	2 – 6,9	4 – 12,1

Table 3.

The structure of the perinatal losses in pregnant women with the IUGRS according to the gestation term, abs.,%

Period of perinatal loss	22-28,6 weeks	29 – 32,6 weeks	33 – 36,6 weeks
	20	21	12
antenatal	7 – 35,0	10 – 47,6	5 – 41,7
intranatal	–	–	1 – 8,3
early neonatal	7 – 35,0	6 – 28,6	2 – 16,7
late neonatal	6 – 30,0	5 – 23,8	4 – 33,3

The symmetric IUGRS in subgroup 1 was diagnosed in 10 (41,7%), asymmetric – in 14 (58,3%); in the 2nd subgroup the symmetric IUGRS was confirmed in 7 (24,1%), the symmetric one – in 22 (75,9%); in the third subgroup appropriately the symmetric IUGRS was diagnosed in 8 (24,2%) and asymmetric – in 25 (75,8%).

Placental dysfunction was noted in subgroup 1 in 66,7% of cases, subgroup 2 – in 62,1% of cases, subgroup 3 – in 72,7% of cases. These data confirm the opinion of many scientists that the placental dysfunction is the basis for the IUGRS development [5, 8, 12].

The hypamnion was most frequently encountered in subgroup 1 – in 37,5% of cases, subgroup 2 – in 20,7% of cases, subgroup 3 – in 21,2% of cases.

The various degree hemodynamic interference of circulation according to the performed dopplerometry was detected within the subgroup 1 in 83,3% of all cases, within the subgroup 2 and 3 – appropriately in 75,9% and 78,9% of all cases.

Natural delivery occurred within the subgroup 1 in 14 (58,3%) women, operative delivery – in 10 (41,7%) women, within the subgroups 2 and 3 appropriately 22 (75,9%) and 7 (24,1%), 21 (63,6%) and 12 (36,4%). The indications for the operative delivery included urgent factors (fetal distress, premature placental abruption) and post- Caesarian uterine scar, pelvic abnormalities, etc.

4 (16,7%) of the 1st subgroup newborns survived, 20 (83,3%) died, within the 2nd and 3rd subgroup these figures make up 8 (27,6%) and 21 (72,4%), 21 (63,6%) and 12 (36,4%) appropriately. If the gestational term the IUGRS was diagnosed at increased, the amount of survivals increased as well. The highest percentage of the infant deaths (83,3%) was observed in the subgroup with a little gestation period of 22-28, 6 weeks.

The perinatal loss structure is presented in the table 3.

The highest percentage of the perinatal losses in the IUGRS is characteristic for the antenatal period and it doesn't depend on the gestation term. The children with the IUGRS who die within the early neonatal period most often are lost in the early gestation term, e.g. 22-28, 6 weeks.

All the examined children were diagnosed with the IUGRS at birth.

Conclusions. The intrauterine growth restriction syndrome is characterized by a high number of perinatal losses. The early development of the IUGRS is a prognostically unfavorable factor for the pregnancy outcome and delivery outcome.

The increasing severity of the IUGRS is caused by the progressing interference of the utero-placental and fetal circulation.

Reviewer: Corresponding Member NAMS Ukraine, professor B.M. Ventskovskiy

REFERENCES

1. Martynova I.V. Leading risk factors and differential diagnosis of intrauterine growth retardation: Autoref. dis. ... Candidate of med. sciences. – M., 2006. – 22 p.
2. Medvedev M.V. Doppler in obstetrics. / M.V. Medvedev. – M.: RAVUZDPG, Realnoyevremia, 1999. – 160 p.
3. Savelieva G.M. Maternal mortality and ways to reduce / G.M. Savelieva, M.A. Kurtser, R.I. Shalina // *Obstetrics and Gynecology*. 2009. – № 3. – P.11-15.
4. Sidelnikova V.M. Premature birth. Preterm birth. / V.M.Sidelnikova, A.G.Antonov – M.: Geotar medicine, 2006 – 448 p.
5. Filippov O.S. Placental insufficiency: a clinical guide to effective care. / O.S.Filippov. – M.: MEDpress-inform, 2009. – 159 p.
6. Chatelain P. Children born with intra-uterine growth retardation (IUGR) or small for gestational age (SGA): long term growth and metabolic consequences / P.Chatelain // *EndocrRegul*. 2000 – V. 34. – №1 – P. 33-36.
7. Diamond F.B. Jr. Fetal growth programs future health: causes and consequences of intrauterine growth retardation/ F.B. Jr.Diamond // *AdvPediatr*. 2001. V. 48. – P. 245-272.
8. Sankaran S. Kyle P.M. Aetiology and pathogenesis of IUGR / S.Sankaran, P.M. Kyle // *Best Pract Res Clin. Obstet. Gynaecol* 2009.- Vol. 23, № 6. – P. 765-777.
9. Roy A., Mukherjee S., Bhattacharyya S.K., Banerjee P., Das B., Patra K.K. Perinatal outcome in pregnancies with intra-uterine growth restriction by using umbilical and middle cerebral artery colour Doppler / A. Roy, S. Mukherjee, S.K. Bhattacharyya. // *Indian Med Assoc*. 2012. – Mar. Vol. 110 (3).- P. 154 -157.
10. Thompson J.L. Antenatal surveillance of fetal growth restriction / J.L. Thompson, J.A. Kuller, E.H. Rhee. // *Obstet. Gynecol. Surv*. 2012. – Sep. – Vol. 67 (9).- P. 554-565.
11. Damodaram M. Early adverse perinatal complications in preterm growth-restricted fetuses / M. Damodaram L. Story, E. Kulinskaya // *Aust N Z J. Obstet. Gynaecol*. 2011. – Jun. – Vol. 51 (3). – P. 204-209.
12. Jang D.G. Perinatal outcomes and maternal clinical characteristics in IUGR with absent or reversed end-diastolic flow velocity in the umbilical artery / D.G Jang, Y.S. Jo, S.J. Lee // *Arch Gynecol Obstet*. 2011 Jul. – Vol.284 (1). – P. 73-78.
13. Ono Y. Neonatal outcome in infants of chronically hypertensive mothers / Y. Ono, K. Takagi, H. Seki. // *J. Obstet. Gynaecol. Res*. 2013 Jun. – Vol. 39 (6). – P. 1142-1146.

ПЕРИНАТАЛЬНЫЕ ИСХОДЫ ПРИ СИНДРОМЕ ЗАДЕРЖКИ РОСТА ПЛОДА

Коростиль М.А.

Национальный медицинский университет имени А.А. Богомольца, Киев, Украина

Резюме. В статье представлены результаты оценки перинатальных исходов при беременности, осложненной синдромом задержки роста плода (СЗРП). Установлено, что раннее развитие СЗРП является прогностически неблагоприятным фактором, обуславливающим высокий процент перинатальных потерь.

Ключевые слова: беременность, СЗРП, перинатальные исходы.

ПЕРИНАТАЛЬНІ НАСЛІДКИ ПРИ СИНДРОМІ ЗАТРИМКИ РОСТУ ПЛОДА

Коростиль М.А.

Національний медичний університет імені О.О. Богомольця, м. Київ, Україна

Резюме. У статті представлені результати оцінки перинатальних наслідків при вагітності, яка ускладнилася синдромом затримки росту плода (СЗРП). Встановлено, що ранній розвиток СЗРП є прогностично несприятливим чинником, що обумовлює високий відсоток перинатальних втрат.

Ключові слова: вагітність, синдром затримки росту плода, перинатальні наслідки.