PEDIATRICS

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RISK FACTORS OF CARDIOVASCULAR DISORDERS IN NEWBORNS FROM MULTIPLE DICHORIAL BI-AMNIOTIC TWIN PREGNANCIES

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Abstract: The research deals with the study of characteristics of obstetrical, intrapartum and early neonatal periods. Dichorial biamniotic twin pregnancy was the inclusion criterion. One of the risk factors was threatened abortion and/or premature labor. Anemia of pregnancy, acute respiratory viral infections and urogenital infections had no statistically significant differences among the groups of observation. Every third woman 29% with multiple dichorial biamniotic twin pregnancy was found to have a trend towards an increase in incidence of polyhydramnios, and every third woman 30.4% with singleton pregnancy and IUGR had oligohydramnios.

KeyWords: aorta, IUGR, multiple pregnancy

INTRODUCTION

According to leading scientists, clinicians and health care authorities, diagnosis of hemodynamic disorders in "mother-placenta-fetus" system and prognosis of placental dysfunction in multiple pregnancy is one of the current challenges in obstetrics, perinatology and neonatology, which should be dealt with to reduce perinatal morbidity and mortality [1-5].

Dopplerometric examination of fetal aorta is performed in the thoracic section between the aortic arch and the diaphragm, i.e. before the branching point of arterial trunks of the abdominal cavity. The aorta is visualized in the longitudinal scan as an echo-free area limited by pulsating echo-free margins [6]. Nowadays the mechanisms of blood flow redistribution during distress are explained in terms of adrenoreception physiology. Cerebral vessels are mainly represented by ß-receptors, as compared to other organs, which means that cerebral blood flow remains intact in distress. Redistribution of blood to the brain secondary to distress results from an increase in the density of ß-adrenoreceptors of the cerebral vessels.

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Normal indices of blood flow in cerebral vessels and non-physiologic ones in the aorta or umbilical artery may indicate a delayed diagnosis of fetal abnormality with decompensation of cerebral circulation [6, 7].

As it has already been established, blood in the umbilical artery, aorta and cerebral arteries flows from the heart to the periphery during the whole cardiac cycle [7].

2 PURPOSES, SUBJECTS AND METHODS:

2.1 Purpose

The aim of the study was to study risk factors of cardiovascular disorders in newborns from multiple biamniotic pregnancies.

2.2 Subjects & Methods

The study involved 37 newborns from multiple dichorial biamniotic twin pregnancies without intrauterine growth retardation (Group 1); 25 newborns from multiple dichorial biamniotic twin pregnancies with intrauterine growth retardation (Group 2); 27 infants from singleton pregnancies without IUGR (Group 3 – control group); 23 infants from singleton pregnancies with IUGR (Group 4 – the group of comparison). The research implied determination of characteristics of obstetrical, intrapartum and early neonatal periods.

Dichorial biamniotic twin pregnancy was the inclusion criterion. Median (Me), quartile values (Uq; Lq) and Mann-Whitney (MW) criteria were used to compare the indices with non-Gaussian distribution. Statistically significant difference was considered at $p < 0.05$.

Conflict of interests

There is no conflict of interests.

3 RESULTS AND DISCUSSION

Women with multiple pregnancy were significantly more likely to require implementation of reproductive technologies ($p < 0.05$) and their infants required observation in the maternity hospital for a more prolonged period ($p < 0.05$).

It stands to mention that newborns from singleton pregnancies with IUGR (Group 4) required significantly more prolonged observation in the maternity hospital compared with newborns from multiple pregnancies and the control group ($p < 0.05$). None of the children from any group under investigation died in the early neonatal period. The results of the study of obstetrical medical history of the mothers involved in the investigation are given in Table 1. Multiple pregnancy statistically significant in frequency ranked second when compared to singleton pregnancy with IUGR (Group 3), ($p > 0.05$). Threatened abortions and/or premature labor occurred significantly more often in mothers with singleton pregnancy and IUGR of the fetus (73.9%) compared to women in the control group (40.7%), ($p < 0.05$). Women with multiple pregnancies were found to have an increased incidence of threatened abortions and/or premature labor (up to 65% with no statistical difference when compared to other groups of observation). Perinatal loss, such as spontaneous abortions, death of children from previous pregnancies and stillbirths occurred with equal frequency in the groups of observation. Anemia of pregnancy, acute respiratory viral infections and urogenital infections did not have any statistically significant differences among the groups of observation.

Table 1.

Characteristics of obstetrical medical history of the mothers involved in the investigation

Indices		Observation group		
		Group 1, n=31	Group 2, n=27	Group 3 n=23
		abs. ($p\%\pm s_{p\%}$)	abs. ($p\%\pm s_{p\%}$)	abs. ($p\%\pm s_{p\%}$)
Consecutive number of pregnancy	1-st	8 (25.8±7.8)	10 (37.0±9.2)	8 (34.7±9.9)
		$p_{1-2} > 0.05$, $p_{1-3} > 0.05$, $p_{2-3} > 0.05$		
	2-nd	14 (45.1±8.9)	10 (37.0±9.2)	4 (17.3±7.8)
		$p_{1-3} = 0.0352$		
	3-rd	4 (12.9±6.0)	3 (11,1±6,0)	0 (0±2.3)
		$p_{1-2} > 0.05$, $p_{1-3} > 0.05$, $p_{2-3} > 0.05$		
	> 3-rd	5 (16.1±6.6)	4 (14.8±6.8)	4 (17.3±7.8)
		$p_{1-2} > 0.05$, $p_{1-3} > 0.05$, $p_{2-3} > 0.05$		
Obstetrical pathology	Placentation abnormality	4 (12.9±6.0)	3 (11.7±6.0)	4 (17.3±7.8)
		$p_{1-2} > 0.05$, $p_{1-3} > 0.05$, $p_{2-3} > 0.05$		
	Threatened miscarriage and/or premature labor	20 (64.5±8.5)	11 (40.7±9.4)	17 (73.9±9.1)
		$p_{2-3} = 0.028$, $p_{1-2} > 0.05$, $p_{1-3} > 0.05$		
	Preeclampsia	4 (12.9±6.0)	0 (0±3.7)	3 13.0±7.0)
		$p_{1-2} > 0.05$, $p_{1-3} > 0.05$, $p_{2-3} > 0.05$		
Children mortality in previous pregnancies and stillbirth	Spontaneous abortion	6 (19.3±8.9)	6 (22.2±7.9)	2 (8.6 ± 5.8)
		$p_{1-2} > 0.05$, $p_{1-3} > 0.05$, $p_{2-3} > 0.05$		
	Anemia of pregnancy	11 (35.4 ± 8.5)	8 (29.6 ± 8.7)	9 (39.1 ± 10.1)
		$p_{1-2} > 0.05$, $p_{1-3} > 0.05$, $p_{2-3} > 0.05$		
	Urogenital infection of the mother	6 (19.3±7.0)	5 (18.5±7.4)	2 (8.6±5.8)
		$p_{1-2} > 0.05$, $p_{1-3} > 0.05$, $p_{2-3} > 0.05$		
	Acute respiratory diseases during pregnancy	8 (45.1±8.9)	7 (25.9±8.4)	7 (25.9±8.4)
		$p_{1-2} > 0.05$, $p_{1-3} > 0.05$, $p_{2-3} > 0.05$		
	Gestational pyelonephritis	2 (6.4±4.3)	2 (7.4±5.0)	6 (26.0±9.1)
		p1-2> 0.05, p1-3> 0.05, p2-3> 0.05		
Abnormalities of fetal membranes and amniotic fluid	Hydramnion	9 (29.0±8.1)	0 (0±2.7)	3 (13.0±7.0)
		$p_{1-2} = 0.0053$, $p_{2-3} > 0.05$, $p_{1-3} > 0.05$		
	Oligohydramnios	6 (19.3±7.0)	0 (0±2.7)	7 (30.4±9.5)
		$p_{1-2} = 0.0305$, $p_{2-3} = 0.0045$, $p_{1-3} > 0.05$		

Every third woman (29%) with multiple dichorial biamniotic twin pregnancy was shown to have an increase

in incidence of polyhydramnios compared to controls (p <0.05) and every third women (30.4%) with singleton pregnancy and IUGR was found to have oligohydramnios (p < 0.05).

4 CONCLUSIONS

1. One of the factors is that threatened abortions and/or premature labor occurred significantly more frequently in mothers with singleton pregnancy and IUGR of the fetus, 73.9% compared to 40.7%, (p <0.05) of the control group. Women with multiple pregnancies were shown to have a trend towards an increase in the frequency of threatened abortions and/or premature labor up to 65% without statistical differences with other groups of observation.

2. Anemia of pregnancy, acute respiratory viral infections and urogenital infections had no statistically significant differences among groups of observation.

3. Every third woman 29% with multiple dichorial biamniotic twin pregnancy was found to have an increased incidence of polyhydramnios compared to the control (p<0.05) and every third woman 30.4% with singleton pregnancy and IUGR had oligohydramnios (p <0.05) .

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