

Physical Development of Low Birth-Weight Children at Preschool Age, Born to Adolescent Mothers of Bishkek

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ABSTRACT

Objective: This paper presents the results of a risk factors- analysis and the analysis of physical development of pre-school children born with a low birth weight to teenage mothers.

Materials and Methods: The study has also identified unfavorable factors affecting the birth of low weight children and the lag in physical development of preschool children born with low birth weight to adolescent mothers.

Results: According to our research, children born out of wedlock are mostly born with low birth weight (66.7%) and student mothers who had psychological and physical stress during pregnancy.

Conclusion: Adolescent mothers who lacked a sufficient and balanced diet, had a high risk of born child with IUGR of hypotrophic type of the 2nd degree.

Keywords: Low birth-weight baby, body weight, pre-school children, adolescent mothers

Introduction

According to current literature, in recent years there has been an increase in children born with low birth weight in relation to gestational age – intrauterine growth retardation (IUGR). One of the reasons for this is the young age of the mother. Researchers agree that IUGR of fetus is one of the main causes of perinatal morbidity and mortality [1-3], significantly exceeding the rate in children with normal birth weight. The frequency of birth of children with low birth weight varies widely from 3.5 to 17.5% of total births [4, 5].

Problems and peculiarities of the gestational course and delivery among adolescents were described in full in the available literature. There was insufficient information available regarding the comprehensive assessment of the physical development and formation of children born to teenage mothers [4].

The aim of this study was to identify the risk factors for low birth weight, and evaluate the physical development of preschool children born to teenage mothers.

Materials and Methods

The scientific research was carried out from 2010 to 2013. We studied 62 pre-school children, with full-term low birth weight born to young mothers, and a control group of 25 children with normal weight born to young mothers in Bishkek (5-6 years). All children born to mothers under 18 years old, delivered at 37-40 weeks of the pregnancy. There were 24 boys and 38 girls in the study group. All children were analyzed for anthropometric data, their medical records were studied (prenatal record card of the women (Form 113/U), infant record card (Form 112/U)). During the study, the children were divided into subgroups depending on the severity of the IUGR. Clinical diagnosis of IUGR was conducted by major diagnostic criteria, proposed by Dementeva G. M. [6].

The severity of IUGR hypotrophic options was determined by underweight body in relation to body length for appropriate gestational age: First degree (mild – weight deficit of 1.5 – 2 sigma) 23 children (62.2%); Second degree (moderate severity – mass deficit of 2-3 sigma) 14 children

(37.84%), Third degree (severe – a deficit of more than 3 sigma) – was not found.

Physical development of the children was assessed by comparing the anthropometric indicators of children with the standards developed by the WHO Expert Group [7]. According to the standards, the following indices were outlined: “weight-for-length” and “weight-for-age.” Low weight-for-length is the result of a lack of weight gain or weight loss and indicates severe malnutrition, reflecting the severe weight loss. Low weight-for-age may evidence both severe and chronic malnutrition or disease.

Statistical Analysis

Statistical data processing was performed using analysis package Microsoft Excel 2014 to assess the significance of differences in the results at normal distribution using Student’s t test. Tables list the mean values and error of mean.

Results

According to our research, children born out of wedlock are mostly born with low birth weight (66.7%) (Table 1) and they are schoolgirls, student mothers who had psychological and physical stress during pregnancy, as well as who lacked

a sufficient and balanced diet, had a high risk of born child with IUGR of hypotrophic type of the 2nd degree (66.7%) (Table 2).

It was revealed that more than half of children with hypotrophic type of the 2nd degree (59.2%) were born to mothers who constantly smoked during pregnancy.

Analyzing the historical data on the course of the pregnancies, it was found that 67.6% of women who gave birth at the age of 16-17 were primiparous women, bearing babies for the first time. Multiparous women of 18 years old accounted for 32.4% of the examined women. Among these multiparous women, 41.7% faced interrupted pregnancies by spontaneous miscarriage, 8.3% had medical abortions, 25% gave birth to stillborn babies and 25% gave birth to children with IUGR.

It was also found that all mothers studied faced gestational toxicosis of various degrees throughout pregnancy; anemia in 67.7%, fetoplacental insufficiency in 87.7%, intrauterine infection in 70.3%, endocrine, nutritional and metabolic diseases in 40%, polyhydramnios in 86.5%, multiple pregnancies in 13.5% and 8.1% of mothers with low weight also gave birth to LBW children.

Among mothers, 73% had a vaginal delivery and 27% gave birth by cesarean section. Complications during labor were as follows: early discharge of amniotic fluid in 62.2%, intrauterine fetal hypoxia in 73%, slow progress in labor in 27% and trauma of the birth canal in 48.6%. Indications for caesarean section in young mothers included chronic placental insufficiency, acute intrauterine fetal hypoxia and narrow pelvis of the mother.

When analyzing the anthropometric data of children of preschool age, it should be noted that the body mass and height of girls and boys did not differ significantly (Table 3). However, indicators of physical development in boys and girls are lower than in control group (p<0.05).

Discussion

To identify the risk factors for IUGR in children, the maternal variables studied included marital status, obstetric history, state of health of the mother during pregnancy, social habits, etc. Marital status, as revealed, is a separate risk factor for IUGR (Table 1). Social status and line of profession has a certain influence on the development of pregnancy and the incidence of fetal growth retardation. According to our data, IUGR is also observed in mothers whose work involves physical labor and who are unemployed (Table 2).

In most cases of the children with IUGR, unemployed mothers and mothers engaged in physical labor had a low level of material resources in the family that probably contributed to the limited treatment of physical and gynecological diseases, as well as being a reason for a low protein diet and low vitamin pregnancy.

Mother’s bad habits were important factors affecting the risk of having a baby with IUGR. Particular attention was paid to maternal smoking as a risk factor contributing to a LBW baby. As is well known, cigarette smoking can lead to a retardation of intrauterine growth. Regular smoking during pregnancy can cause the fetus suffer from a chronic oxygen deficiency.

According to the findings, the birth of a child with IUGR affects uterine pathology, chronic placental insufficiency, inflammatory diseases of the pelvic organs, complications of pregnancy, infection of the placenta and obstetric history.

Thus, considering the peculiarities of physical development of children, according to the scientific literature, one third of LBW kids are behind in their physical development throughout the childhood (difference in weight and growth

Table 1. Characteristics of Marital Status of the mothers of children with IUGR

Marital Status	Hypotrophic children		Control group
	1 st degree n=23	2 nd degree n=14	n=25
Married	53.3%	33.3%	92%
Unmarried (cohabitation)	46.7%	66.7%	8%

Table 2. Professional occupation of the mothers of children with IUGR

Type of occupation	Hypotrophic children		Control group
	1 st degree n=23	2 nd degree n=14	1 st degree n=25
Unemployed	13.3%	-	76%
Physical labor	40%	33.3%	-
Students	46.7%	66.7%	24%

Table 3. Anthropometric characteristics of girls and boys (5-6 years old)

Indicators	Hypotrophic children		Control group
	1 st degree M±m	2 nd degree M±m	M±m
	Girls n=38		
Body weight, kg	16.3±0.19	15.1±0.18	17.9±0.12
Body height, cm	112.4±0.33	106.03±1.05	110.9±0.49
	Boys n=24		
Body weight, kg	16.54±0.19	15.1±0.15	17.5±0.23
Body height, cm	109.9±1.13	108.8±1.5	112.6±0.88
p	<0.05	<0.05	<0.05

between LBW and normal birth weight children range from 500 g to 2 kg of weight indicators and from 2 to 7 cm for growth deficit). The assessment of the physical development of children was conducted using centile assessment of anthropometric indicators for body height and body weight of newborns. Assessment of anthropometric parameters was performed separately for girls and boys. Physical development indicators of children are shown in Table 3.

In conclusion this study showed that poor obstetric history, social status and profession, as well as young maternal age are risk factors associated with low birth rate. It is revealed that preschool children with low birth weight, regardless of the severity of IUGR, have a similar lag in physical development as compared to normal birth weight children born to young mothers.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of UDK 616-591.

Informed Consent: Written informed consent was obtained from the patients' parents.

Peer-review: Externally peer-reviewed.

Conflict of Interest: Authors have no conflicts of interest to declare.

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