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## Disadaptation infants at high risk — the result of the negative impact of complicated pregnancy and childbirth

**Abstract:** The purpose of the study- the influence of adverse maternal factors violation postnatal adaptation of newborns at high risk. The study included 747 newborns (270 preterm), of which 440 children born by caesarean section. In the formation of neonatal disadaptation factors had the greatest significance burdened obstetric and gynecological history mothers (abortion, inflammatory diseases of female genitalia, nulliparous age older than 30 years in conjunction with various somatic and obstetric pathology), complicated pregnancy (growth retardation, threatened abortion, hemodynamic instability in the mother-placenta-fetus), intrapartum period (deterioration women extra-genital pathology, preeclampsia, severe, chronic hypoxia and/or acute asphyxia, which started bleeding).

**Keywords:** risk factors for antenatal and intrapartum periods, caesarean section, premature, cerebral hypoxia-ischemia, neonatal disadaptation.

**Relevance.** Problems of women's health in various stages of gestation, and the status of the developing fetus and newborn occupy one of the leading places in the modern health care. The most common cause of disability of the child population is diverse defeat the perinatal period [1; 2; 3]. In case of violation functioning of the various systems of the parent body, responsible for the development of adaptive changes during pregnancy, numerous physiological adaptive processes are imperfect [4; 5]. This promotes the formation of obstetric pathology (noncarrying, preeclampsia, anemia, etc.), exacerbation of chronic and/or manifestation of latent diseases. The risk of perinatal pathology increases the formation of pregnancy and childbirth complications leading to operative delivery [6; 7]. Modern techniques used in obstetrics and neonatology can not completely neutralize the effects of pathological factors on children from high-risk groups (preterm, born surgically, children who have suffered hypoxia-ischemia, etc.) [8; 9; 10]. In this regard, a detailed examination of pregnant women and the identification of risk factors are essential for the prevention

of complications of pregnancy, labor and perinatal pathology. Aim of this study was to evaluate the significance of risk factors for antenatal and intrapartum periods in the development of early adaptation disorders in infants at high risk for the development of perinatal pathology.

**Patients and methods.** A comprehensive clinical and instrumental study of health 690 newborns at risk in the early period of adaptation. The main group (I) of 290 children born by cesarean section and post-hypoxia-ischemia (120 full-term, 170 preterm). Comparison group-1 (II): 150 full-term infants after caesarean section with no signs of cerebral ischemia during the early adaptation. Comparison group-2 (III): 250 newborns from natural birth with the transfer of hypoxic-ischemic (150 full-term, 100 preterm). Exclusion criteria: children with congenital abnormalities, infectious processes, syndromic disorders. Control group (IV)-57 full-term newborns of physiological pregnancy and birth with Apgar score 8/8 points. To study the dependence disorders early neonatal adaptation processes at increased risk from exposure to pathological factors

of antenatal and intrapartum periods analyzed stationary cards mothers in the groups studied with the evaluation of obstetric and gynecological history, physical status, studied the spectrum of indications for cesarean delivery. Statistical data processing was carried out using the «Statistica». Quantitative indicators were analyzed by Student's test with the arithmetic mean ( $M$ ), standard error of the mean ( $\pm m$ ) and the corresponding level of confidence; to compare qualitative variables used criterion  $\chi^2$ .

Table 1. – Analysis of some indicators of obstetric and gynecological history mothers studied groups

Indicators	I group, n = 290		II group, n = 150	III group, n = 250		IV group, n = 57
	1-subgr., n = 120	2-subgr., n = 170		1-subgr., n = 150	2-subgr., n = 100	
Age, years	27,2 ± 0,65	28,6 ± 0,82	29,3 ± 0,81	25,8 ± 0,79	26,3 ± 0,96	26,9 ± 0,71
Primigravida, n (%)	66 (55 %)	67 (39 %)	40 (27 %)	85 (57 %)	50 (50 %)	23 (40 %)
First birth, n (%)	77 (64 %)	85 (50 %)	69 (46 %)	93 (62 %)	60 (60 %)	28 (49 %)
Abortions, n (%)	28 (23 %)	67 (39 %)*	42 (28 %)	38 (25 %)	42 (42 %)*	10 (18 %)
Miscarriages, n (%)	4 (3 %)	29 (17 %)*	1 (0,6 %)	6 (4 %)	25 (25 %)*	–
Repeated cesarean, n (%)	21 (18 %)	18 (11 %)	48 (32 %)	–	–	–
Inflammatory diseases of female genitalia, n (%)	21 (18 %)	40 (24 %)*	11 (7 %)	33 (22 %)*	24 (24 %)*	5 (9 %)

Note: \* — reliability of differences comparing groups of women from the control at  $p < 0,05$

Women in their first pregnancy was less compared to women who have a first birth ( $p > 0,05$ ). Abortions among mothers whose children suffered hypoxia-ischemia (95 (33 %) in the study group, 80 (32 %) in the comparison group-2), significantly higher than in controls (10 (18 %) ( $\chi^2 = 4,53$ ,  $p = 0,033$  and  $\chi^2 = 4,01$ ,  $p = 0,045$ ). Especially often spontaneous abortions, medical abortions ( $\chi^2 = 8,15$ ,  $p = 0,004$ ) were detected in women with preterm labor. Changes relating to artificial interruption of pregnancy, especially the first pregnancy, the most common cause of recurrent miscarriage, complications in childbirth and the postpartum period (occurrence of abnormalities of labor, bleeding, postpartum diseases, etc.). The risk of pregnancy complications increases in inflammatory diseases of internal genital organs, including the problems after childbirth and abortion [11].

In our study, the mothers whose children suffered hypoxia-ischemia, significantly more prevalent chronic and/or acute inflammatory diseases of female genitalia (61 (21 %) and 57 (23 %) in the study group and the comparison group-2 with respect to 5 (9 %) in the control group,  $\chi^2 = 3,89$ ,  $p = 0,049$  and  $\chi^2 = 4,83$ ,  $p = 0,02$  respectively). The frequency of miscarriage (ectopic pregnancy, non-developing pregnancy) in the study groups were comparable (2–9 %,  $p > 0,05$ ). Repeat cesarean section reported in 11–32 % of women. Surgery on the uterus predispose to the formation of its insolvency in the future (degenerative processes, fibrosis, the threat of spontaneous rupture during pregnancy and childbirth, etc.) [12]. Thus, women of delivery by caesarean section can be attributed to the high risk group for the development and frequency of obstetric pathology.

The formation of complicated pregnancy, in particular the development of preeclampsia, especially in the second half, hypochromic anemia and other complications has a

**Results and discussion.** Of all studied 540 (72 %) children suffered cerebral hypoxia-ischemia of varying severity. In 362 (48 %) infants revealed disturbance of early adaptation with significant prevalence in survivors hypoxia-ischemia ( $\chi^2 = 57,92$ ,  $p = 0,000$ ). In the study groups have been identified all mothers burdened obstetric and gynecological history (Table 1).

pronounced effect extragenital pathology. The main damaging factors that determine the occurrence of fetal abnormalities in diseases of pregnant refers hypoxia. It contributes to the deterioration of metabolic processes and the removal of metabolic products of fetal intoxication, promotes the formation of other pathogenic influences. In our study, extragenital pathology in pregnant women identified in 56–78 %, combined pathology recorded in 19–37 % of cases ( $p > 0,05$ ) with the relative prevalence of morbidity in women surgically delivery.

Burdened obstetric and gynecological history and somatic disadvantage women contributed to the development of complications of pregnancy, especially in the study group (Table 2). Preeclampsia varying severity (in 52–58 % of the cases), and anemia (from 37–42 % of women) often formed in women comparison groups in contrast to the control group ( $p < 0,05$ ). Threatened miscarriage occurred in 28 % of women from the main group and in the comparison groups in 21–23 % of cases, reaching the level of statistical significance with the control only in the main group. On the background of complicated pregnancy, more than half (54 %) women had a core group of chronic placental insufficiency, and in the comparison groups, in 26–30 % of cases. When placental insufficiency disrupted the structure and function of the placenta, worsen conditions for supply of gas exchange and excretion of metabolic waste products from the body of the fetus. As a result, hypoxia, growth retardation, susceptibility to birth asphyxia, birth injuries and diseases in the neonatal period [1; 2; 3; 8; 10].

Totality of pathological factors complicated pregnancy formed a number of pregnant women is a cesarean delivery (Fig. 1). The most commonly performed operative delivery with repeated cesarean delivery (18–32 %), antepartum discharge of amniotic fluid and the development of the weakness of labor (9–12 %) started asphyxia (6–17 %),

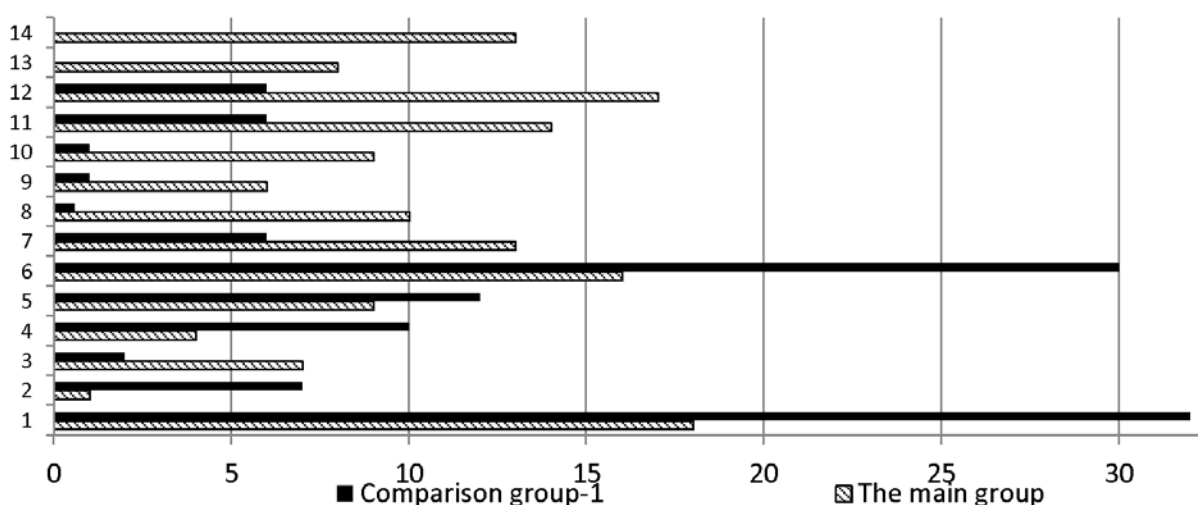
severe preeclampsia (6–14%), severe somatic pathology of women (13%). In this combined indications dominated women group (in 119 (41%) versus 49 (27%),  $\chi^2 = 6,68$ ,  $p = 0,010$ ), especially in preterm pregnancy (in 94 (55%)

women;  $\chi^2 = 23,18$ ,  $p = 0,000$ ). It should be noted that in the comparison groups for a number of indications for the cesarean section identified the differences did not reach statistical significance level.

Table 2. – Analysis of some pregnancy complications

Indicators	I group, n=290		II group, n=150	III group, n=250		IV group, n= 57
	1-subgr., n=120	2-subgr., n=170		1-subgr., n=150	2-subgr., n= 100	
Preeclampsia, n (%)	62 (52%)*	95 (56%)*	87 (58%)*	81 (54%)*	50 (50%)*	17 (29%)
$\chi^2$	10,31; p=0,001		12,01; p=0,000	64,24; p=0,000		
Fetoplacental insufficiency, n (%)	52 (43%)*	104 (61%)*	39 (26%)	46 (31%)*	30 (30%)*	9 (16%)
$\chi^2$	26,08; p=0,000		1,87; p=0,171	4,25; p=0,039		
Anemia, n(%)	40 (33%)*	69 (35%)*	55 (37%)*	68 (45%)*	38 (38%)*	9 (16%)
$\chi^2$	9,14; p=0,003		7,48; p=0,006	12,91; p=0,000		
Threatened miscarriage, n (%)	33 (28%)*	48 (28%)*	34 (23%)	32 (21%)	20 (20%)	8 (14%)
$\chi^2$	4,12; p=0,042		1,41; p=0,231	0,95; p=0,338		

Note: \* — significant differences comparing groups of women from the control at  $p < 0,05$



Note: 1-uterine scar (scar insolency, repeated cesarean section); 2-high myopia; 3-vitro fertilization program; 4-large fruit, clinical fetal head size mismatch pelvis of the mother; 5-anomaly bony pelvis and genitals; 6-prenatal rupture of membranes, uterine inertia; 7-abnormal fetal presentation; 8-growth retardation; 9-nulliparous age older than 30 years in conjunction with various somatic and obstetric pathology; 10-placenta previa, placental abruption; 11-severe preeclampsia; 12-began asphyxia; 13-chronic fetal hypoxia; 14-heavy-somatic disorders are women

Fig. 1. Main spectrum of indications for cesarean section in the comparison groups

Thus, the analysis of antenatal and intrapartum periods of development of children from high-risk groups identified pathological effect of multiple maternal factors, in most cases combined, which played an important role in shaping the neonatal maladjustment.

**Conclusions.** Violation of early postnatal adaptation of newborns at high risk due to the combined action of the burdened obstetric and gynecological history (abortions, miscarriage pregnancy, inflammatory diseases of female genitalia, repeat cesarean section); during pregnancy complicated with the development of preeclampsia, anemia, preterm labor,

violation of placental blood flow; somatic diseases mothers. The severity of pregnant women contributes to a violation of labor, the emergence of threatening conditions of the fetus, leading to the impossibility of delivery naturally forming indications for cesarean section. Study of the causes and significance assessment of risk factors in the development of perinatal pathology creates opportunities for timely correction maternal factors, the organization of effective medical care for newborns at high risk, enhancing the quality of life of children in the following age periods, which is an important medical and social.

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## Optimization of detection and treatment osteoporosis in children

**Abstract:** the combination of distal Us-densitometry and roentgenoabsorbtiometry is high informative method of diagnosis and monitoring for osteoporosis and osteopenia in pediatric practice. Timely pharmacotherapy correction osteoporosis and allows to prevent the decrease of bone mineral thickness and increase the given index.

**Keywords:** osteoporosis, osteopenia, bone mineral thickness, children.

**Topicality.** Osteoporosis (OP) is the most often metabolic disease of human skeleton, being characterized with the decrease of bone mass to the unit of bone volume without changing it's mineral and organic components' ratio, being accompanied with microarchitectural disorders of bone tissue, leading to increase of bones' breaking and fractures' risk [2; 5; 7]. Last decades carrying out epidemiologic studies convincingly proved, that OP problem is associated with the childhood (1). The disorder of bone formation process or chronic diseases lead to decrease of bone firmness already in the childhood, and, as sequense, to increase OP risk development, and, bones fractures in future [4].

Epidemiological data witness that maximum fractures in childhood cover from 5 to 7, and, from 13 to 14 years old people, and it can be caused with considerable enlargement of body length at that period on the background of age bone mass. Except that, last time the cases of osteoporosis in children became

more often as the symptom of different diseases, that allows to consider the children to have chronic pathology group with high risk of osteroporosis development [2]. Polyetiologicity, polymorphism of clinical picture, small amount of diagnostic devices, allowing to reveal decrease of bone mineral thickness (BMT) at the early stages, make difficult the fight with OP. It leads to large material expenses at treatment the given patents and early disability in their working able age [1–4].

At the modern stage of orthopedics there is no possibility to work out algorithms combinations of ultrasound distal densitometry and reontgenoabsorbtiometry in ambulatory practice and program of complex treatment patients with given pathology, demanding further investigation.

**The aim of study:** evaluation of pilot introduction results in practice of ambulatory diagnosis for methods of distal Us-densitometry and reontgenoabsorbtiometry as the reviewer method.