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Non-Instrumental Risk Predictors of Intrauterine Fetal Malformations

G. A. Ikhtiyarova [2], D. Sh. Kudratova [3]

[1, 2] Bukhara State Medical Institute, Buxara, Uzbekistan

Abstract: We have studied the assessment of the significance of various risk factors for the birth of a child with congenital developmental anomalies on the territory of the Bukhara region. A method for the rational formation of risk groups among pregnant women has been proposed, which will increase the level of timely diagnosis of congenital malformations and reduce perinatal and infant mortality in the Bukhara region. The risk factors were folate deficiency (24.9%), vitamin D deficiency (9.8%), zinc deficiency (12.9%) and chronic iodine deficiency (7.5%). In the course of the analysis, VUAP of the nervous system (34.03%) was revealed, the second place was taken by multiple congenital malformations - (19.9%), the third - VUAP of the circulatory system (2.27%).

Keywords: congenital malformations, chromosomal abnormalities, prenatal diagnosis.

To date, an urgent problem in modern perinatology is intrauterine anomalies of fetal development, which occupy the second place in the structure of perinatal mortality [1, 2.25]. Prenatal diagnosis of developmental anomalies, which makes a significant contribution to infant and child mortality, disability and morbidity, is an important task of modern health care. According to EUROCAT, every year in the world 1 out of 33 newborns have a congenital malformation (CMD), almost 300 thousand children with defects die in the first 4 weeks of life, approximately 3.2 million children have disabilities of varying severity due to this pathology. Despite a significant decrease in perinatal mortality in Uzbekistan in recent years, our indicators are still significantly higher than in Europe [9,11,24]. fertility. In the Bukhara region, he showed that on average it ranges from 6.8% to 8.7% of congenital malformations. Improvement of methods of antenatal diagnostics, screening of pregnant women for the presence of congenital fetal pathology, the introduction of modern perinatal technologies are recognized as one of the main tasks of reducing perinatal mortality in Uzbekistan [1, 4,6,10,11,25].

Various pathogenic factors have an unequal damaging effect on the fetus and the entire fetoplacental system. In this regard, it is rather difficult to separate the degree of influence of one factor from another, to assess whether they act independently of each other or in combination [1,15,18,20].

There are no specific preventive measures to prevent the development of most congenital malformations of the fetus, since they are mostly sporadic [10,12,16,20]. Therefore, at present, prenatal diagnosis of intrauterine fetal anomalies is the most effective measure to prevent the birth of children with congenital anomalies [10,21,24]. Despite the introduction of modern technologies for prenatal diagnostics in Uzbekistan (ultrasound screening, biochemical examinations for markers of fetal malformations, invasive examination methods), the incidence of congenital pathology does not decrease, which leads to the search for new approaches to prevention and identification of risk factors for congenital malformations of the fetus [20,24].

There is a need to form groups with varying degrees of risk for the development of intrauterine fetal anomalies, taking into account the specifics of the effects of antenatal damaging factors and optimization of prenatal diagnostics, in connection with which the goal and objectives of the study were determined [24,26].

Purpose of the study: To develop significant risk factors for the formation of and markers of the development of congenital malformations.

Materials and methods. To study the frequency and structure of malformation and fetal chromosomal abnormalities detected using prenatal technologies, the study group (n = 80) was formed by random sampling ("every third") from all cases of examination of pregnant women using prenatal diagnostic methods. The age of women ranged from 19 to 40 years. In order to identify risk factors (predictors) for the most common malformation and chromosomal abnormalities in the fetus, the study group was subdivided into the main group and the comparison group. The main group consisted of pregnant women with malformation diagnosed in the fetus during pregnancy or after childbirth (n = 45). The comparison group consisted of patients who, according to generally accepted criteria, had a risk of having a child with malformation during pregnancy. The control group was formed from women who applied to the screening center of the Bukhara region who did not have the risk of having a child with intrauterine abnormalities, examined at their own request and subsequently gave birth to healthy children (n = 35). To determine the diagnostic significance of the indicators, we used the determination of the sensitivity, the specificity, the prognostic value of a negative result by the method of early diagnosis of ultrasound and biochemical markers in the screening center. The odds ratio was used as a criterion for determining whether the studied sign is a risk factor for the disease.

Research results and discussion. In the course of the study, the predominance in the main group of women aged 20-24 years (50.8%) was established. The proportion of women of young and young age (18-24 years old) was 2 times higher than in the comparison group (48.6% versus 24.7%, p <0.01), while the proportion of women aged 35 and older - 4 times lower (7.9% versus 32.5%, p <0.01).

When analyzing socio-geographical living conditions, it was found that the overwhelming majority of pregnant women lived in the territory with a changed (9.8%) and strongly changed (86.3%) type of living conditions (p <0.01), but there were significant differences between the main group. and the comparison group for the factor of the type of living conditions was not identified. Women in the main group and in the comparison group were mainly residents of cities (83%), including 49% in the city of Bukhara, respectively, rural women accounted for only 17% (p <0.01). It should be noted that in the main group of residents of the cities of the region there were more than in the comparison group (39.8% versus 28.3%, p <0.05), while in the comparison group, women from Bukhara predominated (55.4 % and 39.1%, p <0.01).

When studying the type of occupation of pregnant women in the main group and the comparison group, it was found that office workers (39.7%) and non-working people (30.4%) prevailed among them. In the group of patients with malformation in the fetus (main) significantly more often than in the comparison group, there were non-working women (33.3% and 20.2%, respectively, p <0.05). 18.1% of pregnant women in the main group and in the comparison group had occupational exposure to risk factors. The structure of occupational hazards was dominated by electromagnetic radiation (50.5%), contact with biomaterial (13.3%) and chemical substances (12.4%). In the main group, an increased professional speech load was more often observed (18.4% and 5.4%, respectively, p <0.01).

One of the most significant factors determining the risk of malformation is a hereditary history of diseases. The analysis showed that the greatest specific weight was occupied by malformation in the family history, which in the main group was 92.8% (p <0.001). Among the malformation in the history, malformations were most often noted, their number prevailed in the main group (87.6%, p1-2 <0.001), the number of CA (Down's disease) in the history, on the contrary, was higher in the comparison group (16.4%, p1-2 <0.001).

When analyzing the prevalence of chronic extragenital pathologies in pregnant women, their high frequency was found in the main group and the comparison group - 88.6%. In the structure of chronic extragenital pathologies of pregnant women, diseases of the respiratory system (24.0%), digestion (26.8%) and urinary system (17.0%) prevailed. In the main group, the prevalence of the

prevalence of allergic diseases was revealed in comparison with the control (18.5% and 1.9%, respectively, p <0.01), including drug allergy (8.9%, p <0.005) and polyvalent allergy (4.3%, p <0.05).

A burdened reproductive history with a high frequency was noted among women in the main group and in the comparison group (artificial termination of pregnancy - 67.2%, spontaneous abortion - 12.8% of cases). In these groups, preterm labor was observed more often than in the control group (6.7%, 14.5% and 1.2%, respectively, p1-3 <0.05, p2-3 <0.05).

Analysis of the study of the parity of pregnancy in women of the compared groups showed that primiparous women prevailed in the main group (66.3%), mainly primiparous (42.4%), while in the comparison group, multiparous (56.7%) and re-pregnant women prevailed. (71.9%), (p1-2 <0.01, p1-3 <0.05). In the main group, primiparous women were found 1.5 times more often than in the comparison group (42.4% and 28.1%, p <0.005), and re-pregnant primiparas - 1.6 times more often (23.9% versus 15 , 2%, p <0.05). At the same time, primiparous (77.3%) and re-pregnant women (63.9%) also dominated in the control group, which reflects the characteristics of the reproductive behavior of women in the region.

When analyzing the course of this pregnancy, it was found that the most frequent complication was threatening early self-abortion (28.8%), acute respiratory viral infections during pregnancy were noted in 21.6% of cases, vomiting of pregnant women - in 13.4%. However, in the main group, the listed complications were significantly less frequent than in the comparison group and in the control group (P1-2 <0.05, P13 <0.05).

When studying the outcomes of pregnancy in the main group of women, abortion for medical reasons naturally prevailed in the 1st (9.2%) and 2-3rd (61.9%) trimesters of pregnancy, which was determined by the need to eliminate affected nonviable fetuses, childbirth in term was noted in 17.7% of women (p1-2 <0.01), in 2.4% spontaneous abortion and antenatal fetal death were noted. It is natural that in the comparison group, preterm birth was noted 3.7 times less frequently than in the main group (8.8%, p <0.01).

In the structure of chronic micronutrient deficiencies among pregnant women, folate deficiency (24.9%), vitamin D deficiency (9.8%), zinc deficiency (12.9%) and chronic iodine deficiency (7.5%) prevail.

In the course of the study, the following prevailed in the structure of VUAP identified in the main group: malformation of the nervous system (34.03%), the second place was taken by multiple congenital malformations - (19.9%), the third - malformation of the circulatory system (2.27%). In the main group in the 1st trimester of pregnancy, malformation and ultrasound markers of chromosomal abnormalities were detected in 16.3% of cases. In 83.2% of patients, isolated malformation or ultrasound scan of chromosomal abnormalities were diagnosed in 16.7% - the changes were combined. The most frequently detected malformation of the nervous system (22-36.7%), malformations of the digestive system (10-31.3%) and malformation of the genitourinary system (5-9.4%). The effectiveness of the echography method in the study conducted in the 1st trimester of pregnancy in relation to chromosomal diseases was noted in 16.7% of cases. In this case, ultrasound scans such as cystic hygroma of the neck and hydrocephalus (75%) had the highest sensitivity.

One of the significant risk factors for the formation of malformation in the fetus is specific deviations from the norm of serum pregnancy markers (SMB). In this study, 16-71% of patients had these abnormalities with various types of malformation. As a result of the analysis, it was found that in congenital pathologies they have a relatively low sensitivity and high specificity. The decrease in PAPP (0.38) had the greatest sensitivity, and the decrease in AFP (0.07) was the least sensitive. Specificity ranged from 0.44 to 0.91, the highest was found to increase AFP (0.91), as well as to reduce hCG and AFP (0.88 and 0.81, respectively), the lowest - to increase hCG (0.44) ... PCR is defined as a relatively stable value for almost all SMBs (from 0.5 to 0.59), the highest - to reduce PAPP and the lowest - to increase and decrease AFP.

When analyzing the data on individual types of congenital anomalies, it was found that with malformation of the nervous system, an increase in AFP (0.83) is most sensitive, with multiple malformation - a decrease in PAPP (0.75), with CMM of the musculoskeletal system - a decrease in PAPP (0.67) , with chromosomal abnormalities - a decrease and increase in hCG (0.67). During the analysis of the changes, their high specificity was established for almost all types of malformation (from 0.53 to reduce PAPP with most malformation to 0.95 - to increase hCG in malformation of the digestive system), the greatest result was noted for increasing AFP in malformation of the nervous system (0 , 55).

In the 2nd and 3rd trimesters of pregnancy, ultrasound was performed in the main group in 77.9%. According to our data, the greatest sensitivity was observed with a combination of several ultrasounds compared with isolated ultrasound (1.9 times more often - 13.3% versus 9.4%). The greatest sensitivity in relation to CA belongs to congenital heart defects (VUAP): 57, 1% with isolated malformation and 20.7% - when combined with other ultrasound. Markers such as vascular plexus cysts, diaphragmatic hernia, polyhydramnios, hypoplasia of the nasal bone were isolated in isolated cases, but their sensitivity for chromosomal abnormalities was 100%. High sensitivity in relation to chromosomal abnormalities (50%) was noted for duodenal atresia, intestinal obstruction, cystic-adenomatous malformation of the lungs, as well as with delayed fetal development (66.7%) and cystic hygroma of the neck (37,%) in combination with other ultrasounds.

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