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Common Risk Factors for Internutore Anomalies of Fetus Development

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Abstract: We have studied the assessment of the significance of various risk factors for the birth of a child with congenital developmental anomalies in the Bukhara region. A method for the rational formation of risk groups among pregnant women is proposed, which will increase the level of timely diagnosis of congenital malformations and reduce perinatal and infant mortality in the Bukhara region.

Keywords: congenital malformations, chromosomal abnormalities, prenatal diagnosis.

Relevance.

To date, intrauterine anomalies of fetal development (AD), which occupy the second place in the structure of perinatal mortality, remain an urgent problem in modern perinatology [1, 2,21,22]. 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 has a congenital malformation (CM), 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 reduction in perinatal mortality in Uzbekistan in recent years, our rates are still significantly higher than in Europe [9,11,21]. fertility. In the Bukhara region showed that on average it ranges from 6.8% to 8.7% of congenital malformations. Improving the methods of antenatal diagnosis, screening pregnant women for the presence of congenital fetal pathology, the introduction of modern perinatal technologies are recognized as one of the main tasks to reduce perinatal mortality in Uzbekistan [1, 4,6,10,11,20].

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 [1,15,18,23].

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 anomalies in the development of the fetus is the most effective measure to prevent the birth of children with congenital anomalies [10,21,21]. Despite the introduction of modern technologies for prenatal diagnosis in Uzbekistan (ultrasound screening, biochemical examinations for markers of fetal malformations, invasive examination methods), the frequency of congenital pathology does not decrease, which leads to the search for new approaches to the prevention and identification of risk factors for congenital malformations of the fetus [20,21,22,27].

There is a need to form groups with varying degrees of risk for the development of intrauterine anomalies in the development of the fetus, taking into account the specifics of the impact of antenatal damaging factors and optimizing prenatal diagnosis, in connection with which the purpose and objectives of the study were determined [19,20,25,26].

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

Materials and methods. To study the frequency and structure of UAAP and fetal chromosomal abnormalities detected using prenatal technologies, the study group (n=80) was formed by random

sampling ("every third") of 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 UA and chromosomal abnormalities in the fetus, the study group was divided into the main group and the comparison group. The main group consisted of pregnant women with VUA, diagnosed in the fetus during pregnancy or after the birth of a child (n=45). The comparison group consisted of patients who, according to generally accepted criteria, had a risk of giving birth to a child with VUA 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 anomalies, examined at their own request and subsequently gave birth to healthy children (n=35). To determine the diagnostic significance of the indicators, the determination of sensitivity, specificity, the predictive value of a negative result by the method of early diagnosis of ultrasound and biochemical markers in the screening center was used. The odds ratio was used as a criterion for determining whether the studied symptom is a risk factor for the disease.

Research results and discussion. In the course of the study, a 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) was 2 times higher than in the comparison group (48.6% versus 24.7%, $p<0.01$), while the proportion of women aged 35 years and older - 4 times lower (7.9% versus 32.5%, $p<0.01$).

When analyzing the socio-geographical living conditions, it was found that the vast majority of pregnant women lived in a 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 by the factor of the type of living conditions was not revealed. Women of the main group and the comparison group were predominantly residents of cities (83%), including 49% in the city of Bukhara, respectively, rural residents accounted for only 17% ($p<0.01$). It should be noted that in the main group of urban residents, the regions were more than in the comparison group (39.8% vs. 28.3%, $p<0.05$), while women from Bukhara prevailed in the comparison group (55.4 % and 39.1%, $p<0.01$).

When studying the occupation of pregnant women in the main group and the comparison group, it was found that employees (39.7%) and non-working persons (30.4%) prevailed among them. In the group of patients with VUA in the fetus (main), non-working women were significantly more common than in the comparison group (33.3% and 20.2%, respectively, $p<0.05$). 18.1% of pregnant women of the main group and 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 chemicals (12.4%). In the main group, increased professional speech load was more often observed (18.4% and 5.4%, respectively, $p<0.01$).

One of the most significant factors that determine the risk of AVAI is a family history of diseases. The analysis showed that the largest share was occupied by UARP in the family history, which in the main group was 92.8% ($p<0.001$). Among UARP in history, malformations were most often noted; their number prevailed in the main group (87.6%, $p1\text{-}2<0.001$), the number of CA (Down's disease) in history, on the contrary, was higher in the comparison group (16.4%, $p1\text{-}2<0.001$).

When analyzing the prevalence of chronic extragenital pathologies in pregnant women, their high frequency was established in the main group and the comparison group - 88.6%. In the structure of chronic extragenital pathologies of pregnant women, diseases of the respiratory organs (24.0%), digestion (26.8%) and urinary system (17.0%) prevailed. In the main group, a predominance of the prevalence of allergic diseases was revealed compared to 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 was noted with a high frequency among women of the main group and the comparison group (induced abortion - 67.2%, spontaneous abortions - 12.8% of cases). In these groups, more often than in the control group, preterm labor was observed (6.7%, 14.5% and 1.2%, respectively, p1-3<0.05, p2-3<0.05).An analysis of the study of the parity of pregnancy in women of the compared groups showed that the main group was dominated by primiparous women (66.3%), predominantly primiparous (42.4%), while in the comparison group - multiparous (56.7%) and multiparous (71.9%), (p1-2<0.01, p1-3<0.05). In the main group, primiparous women occurred 1.5 times more often than in the comparison group (42.4% and 28.1%, p<0.005), and multi-pregnant primiparas - 1.6 times more often (23.9% vs. 15 .2%, p<0.05). At the same time, primiparas (77.3%) and multi-pregnant women (63.9%) also dominated in the control group, which reflects the peculiarities of the reproductive behavior of women in the region. When analyzing the course of this pregnancy, it was found that the most common 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 occurred significantly less frequently 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, termination of pregnancy for medical reasons naturally prevailed in the 1st (9.2%) and 2nd-3rd (61.9%) trimesters of pregnancy, which was determined by the need to eliminate the affected unviable 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 births were 3.7 times less common than in the main group (8.8%, p<0.01).

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

One of the signif icant risk factors for the formation of UA in the fetus are specific deviations from the norm of serum pregnancy markers (MPS). In the study conducted with various types of UA, these deviations were present in 16-71% of patients. As a result of the analysis, it was found that in congenital pathologies they have relatively low sensitivity and high specificity. The greatest sensitivity had a decrease in PAPP (0.38), and the lowest - a decrease in AFP (0.07). The specificity ranged from 0.44 to 0.91, the highest was for increasing AFP (0.91), as well as for reducing hCG and AFP (0.88 and 0.81, respectively), the lowest - for increasing hCG (0.44) . PCR was defined as a relatively stable value for almost all MSPs (from 0.5 to 0.59), the highest for reducing PAPP and the lowest for increasing and decreasing AFP.

When analyzing data on certain types of congenital anomalies, it was found that with UA of the nervous system, an increase in AFP (0.83) has the greatest sensitivity, with multiple UA, a decrease in PAPP (0.75), with congenital malformations of the musculoskeletal system, a decrease in PAPP (0.67), with chromosomal abnormalities - a decrease and increase in hCG (0.67). In the course of the analysis of changes, their high specificity was established for almost all types of CM (from 0.53 for a decrease in PAPP in most CM to 0.95 for an increase in hCG in CM of the digestive system), the highest result was noted for an increase in AFP in CM 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 highest sensitivity was observed with a combination of several ultrasounds compared with isolated USM (1.9 times more often - 13.3% vs. 9.4%). 1% for isolated UA and 20.7% for combination with other ultrasounds. Markers such as choroid plexus cysts, diaphragmatic hernia, polyhydramnios, and nasal bone hypoplasia were isolated isolated cases, but their sensitivity to

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chromosomal abnormalities was 100%. High sensitivity for chromosomal abnormalities (16.6%), multiple malformations 19.9%, CM of the circulatory system 2.27%, CM of the nervous system 34.04%, noted for duodenal atresia, intestinal obstruction, cystic-adenomatous VUA of the lungs , as well as with fetal growth retardation (66.7%) and cystic hygroma of the neck (37.%) in combination with other ultrasound (picture 1).

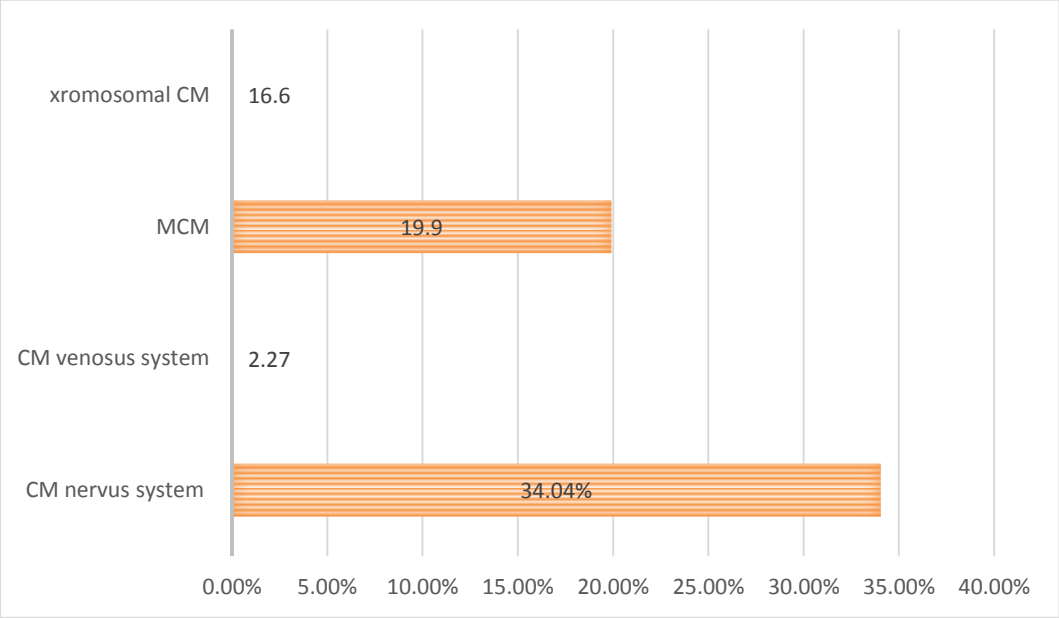

Рисунок- 1. Results of screening analyzes of the incidence of CM

Conclusion

Summarizing the results of our study, we can conclude that the structure of CM detected perinatally is dominated by CM of the nervous system (34.4%), multiple malformations (19.9%), and congenital malformations of the circulatory system (2.27%). In UAVR of the nervous system, the highest sensitivity and specificity is the increase in AFP, as well as ultrasound markers detected in the 1st trimester; with multiple UARP - a decrease in PAPP and ultrasound markers in the 2nd trimester, with UAVR of the circulatory system - ultrasound markers detected in the 2nd-3rd trimesters, with chromosomal abnormalities - a change in the level of hCG and ultrasound markers in the 2nd-3rd m trimesters.

Predictors of the presence of a fetus in a pregnant UA are a history of congenital malformations, deviations according to ultrasound in the 1st and 2nd trimester, changes in PAPP-A, the age of women 16-24 years.

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