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Risk Factors Present During Pregnancy as a Result of the Analysis of Clinical and Anamnestic Data from Mothers' Outpatient Card and Medical History

Sadiev Erali Samievich [1]

[1] Bukhara State Medical Institute

Abstract: Congenital heart defects (CHD) remain an unresolved problem of effective prenatal diagnosis. In the structure of CHD, septal defects of the heart (VSD, ASD, their combination) predominate. The most significant risk factors for CHD are: smoking, exacerbation of chronic diseases, acute infectious viral diseases in the first 6–8 weeks of pregnancy, cytomegalovirus infection, herpes virus infection and their combination, both in the acute and chronic stages of the infectious process.

Keywords: Autopsy, Histology, Myocardium, Disease, Examination.

According to the World Health Organization (WHO), malformations visible at birth are determined in approximately 2.5% of all newborns. Congenital malformations of the heart and great vessels occur with a frequency of 8:1000 live births and are one of the leading causes of childhood morbidity, disability, and mortality [1]. During the last two years (2021, 2022), the autopsy of 54 children who died of various complications after surgery for congenital heart defect of the interventricular wall, interventricular defect, and coarctation of the aorta brought from the Akva Mednayn and Eramed private clinics at the Republican Center for Pathological Anatomy of the UzR SSV clinical-anamnestic and pathologo-anatomical data on the medical history, autopsy report and histological preparations prepared from fragments of internal organs were studied. Among them, the most common types, including: 28 (51.8%) ventricular septal defect, 14 (25.9%) septal defect, 12 (22.2%) coarctation of the aorta were selected as the material of our study.

Congenital heart defects are among the most common malformations among newborns (0.8–1.2%) and remain the leading cause of death in this age group. At least 30% of newborns have critical heart defects, which in 70-80% of cases require emergency cardiac surgery for health reasons in the first hours and days of life. The relevance of the problem of intrauterine diagnosis of heart defects is due to the need to provide timely cardiac surgery to newborns and young children. An equally important problem is prevention — the possibility of preventing the birth of a child with heart disease [1]. It is believed that the genetic component in the formation of the health of both the individual and the population is in many cases decisive. However, only in a small part of cases can the genetic nature of the defect be established. The role of non-inherited factors in negatively affecting the fetal heart has been relatively little studied [2]. In this regard, the analysis of the role of risk factors in the occurrence of congenital heart defects is relevant in the development of measures to prevent them.

As a result of the analysis of the clinical and anamnestic data in the mothers' outpatient card and medical history, it was observed that the risk factors present during pregnancy were found in the following percentages (Table 1). Among the risk factors, acute respiratory viral infection in the first three months of pregnancy was the most common indicator, followed by anemia, followed by cytomegalovirus and herpes virus as risk factors.

Table 1. Number and percentage of risk factors during pregnancy

№	Risk factors	Absolute number	%
1	Acute respiratory viral infection	16	29,6
2	Toxoplasmosis	4	7,4
3	Herpes virus	5	9,3
4	Cytomegalovirus	7	12,9
5	Anemia, 1st degree	12	22,2
6	Chronic pyelonephritis	5	9,3
7	Autoimmune disease	5	9,3
	Total	54	100%

Next, we paid attention to the place of residence of mothers, it turned out that 72.2% live in the city, 27.8% live in the village. Of all the women we studied, 77.8% were housewives, 14.8% were traders, and 7.4% were nurses. The analysis of pregnant women by age gave the following results: 31-35-year-old women have the most, i.e. 31.5%, 36-40-year-olds - 24.2%, 26-30-year-olds - 27.7%, 21-25-year-olds - 12.9 % and 18-20-year-olds made the least 3.7% (Table 2).

Table 2. Distribution of pregnant women by age groups

№	Age groups	Absolute number	%
1	18-20 years old	2	3,7
2	21-25 years old	7	12,9
3	26-30 years old	15	27,7
4	31-35 years old	17	31,5
5	36-40 years old	13	24,2
	Total	54	100%

Congenital defect of the ventricular space in 13 cases, i.e., in 46.4% of cases in the form of a single defect, in 6 cases, in 21.4% of cases with the patency of the Botallov process, in 3 cases, in 10.7% of cases with a defect of the ventricular space, in 4 cases, 14.3% It was found to be combined with narrowing of the pulmonary artery in 2 cases, 7.1% with tetrado phallus. In the assessment of hemodynamic disorders that develop due to this defect, the size, location of the defect, the patient's age, the degree of heart failure, and the resistance of the pulmonary vessels were taken into account. The ventricular septal defect is closed with a prosthesis or Dacron flap, taking care not to damage the valvular layers and conduction pathways. In most cases, the results of the operation are good, but in some cases, the right branch of the Gis bundle may be damaged. Residual, i.e., anatomical and hemodynamic disorders can include blood flow from the left ventricle to the right ventricle, the risk of developing infectious endocarditis, and pulmonary hypertension. As a complication of surgical practice, scarring of the closed defect site, changes in electrocardiography, tricuspid valve insufficiency, atrioventricular block, aortic valve insufficiency were observed.

Interchamber wall defect isolated in 6 cases, that is, in 42.8%, with Botalov protocus open in 3 cases, 21.4%, mitral valve stenosis in 2 cases, 14.3%, atrioventricular valve deformation in 2 cases, 14.3% and superior vena cava defect in 1 case, 7.1%, combined with pulmonary artery valvular stenosis, can be located in the center, upper, lower, back and front parts of the congenital wall defect. This defect, isolated without other defects, was performed in school-aged children. Reconstruction is performed in the heart that has stopped working, that is, the defect is sewn up or closed with various prostheses. Mortality after this operation is around 1%. After surgery, the size of the heart is reduced to normal. Residual, i.e., anatomical and hemodynamic disorders may include the following. Partial preservation of the hole between the compartments, partial enlargement of the heart, bleeding from the right ventricle, development of mitral valve pathology, and pulmonary hypertension can be observed. Mitral valve dysfunction and failure, atrioventricular conduction block were observed as complications.

Coarctation of the aorta with simple isolation in 4 cases, 33.3%, patency of the arterial passage in z cases, 33.3%, ventricular septal wall defect in 3 cases 33.3%, aortic stenosis in 1 case, 8.3%, mitral

valve insufficiency and transposition of trunk vessels were found to be combined in 1 case, 8.3%. It was found that this type of defect is separate and combined with ventricular septal defect, two-layer aortic valve, and three-chamber heart defects in 6% of cases.

Here are clinical and morphological examples of congenital heart defects that we have studied:

1. Pregnant woman P.R. 35 years old, in the 37th week of pregnancy, a defect with a diameter of 6 mm was detected in the membranous part of the interventricular wall of the heart ventricles during routine examinations. The pregnant woman had an acute respiratory viral infection in the first three months of pregnancy, was treated with antibiotics, and increased amniotic fluid was found in the last period of pregnancy. After the birth of the child, it was observed that the hole in the heart defect expanded to 11 mm, surgical treatment was carried out, but the child died of acute respiratory distress syndrome in one month of life, i.e. 34 days after birth.

2. Pregnant woman A.M., 32 years old, at the 27th week of pregnancy, a hole with a diameter of 5.6 mm was detected in the membranous part of the interventricular wall of the heart. A general examination of the child revealed hydrocephalus, esophageal atresia, and an abundance of amniotic fluid. This woman was confirmed to be a carrier of toxoplasmosis, herpes virus, cytomegalovirus, and at the 15th week of gestation, she had an acute respiratory viral infection with increased body temperature. Based on the conclusion of the medical examination commission of the general condition of the pregnant woman, the child was delivered by artificial means at the 37th week. 12 days after the surgery, pulmonary artery thromboembolism developed and she died.

3. Pregnant woman S.L. A 31-year-old woman did not have a viral infection during pregnancy, no changes were detected in the first and second screening tests. During the 32nd week, an ultrasound scan revealed a 6.7 mm diameter defect in the septal wall of the heart chambers. In addition to changes in the heart, the shortness of the tubular bones, which does not correspond to the period of gestation, and an increase in amniotic fluid have been confirmed. After the birth of the child, it was observed that the heart defect increased by 7.5 mm, and the child was diagnosed with Down syndrome. The child died of pulmonary hypertension and pulmonary edema at the age of 2 months.

Conclusions

Of the congenital heart defects, it was confirmed that the most common ventricular septal defect is 23%, septal defect is 16.5%, coarctation of the aorta is 15.2%. As a risk factor for congenital defects, the mother's acute respiratory infection during pregnancy, in most cases in the first trimester viral infection (31.3%), anemia (22.9%), cytomegalovirus (14.6), herpes virus (10.9a).

Ultrasound examination of the heart at the 20th week of gestation is important to detect defects in it. Congenital heart defects, increased amniotic fluid, and shortness of tubular bones are absolute indications for karyotyping of the fetus to rule out chromosomal abnormalities.

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