

**EARLY DETECTION OF CONGENITAL HEART DEFECTS AND THEIR
CLINICAL SIGNIFICANCE**

Khudoynazarov Jahongirmirzo Muzaffar ugli

Andijan branch of Kokand University

Student of group 25-o4, Pediatrics, Faculty of Medicine

Email: umaraliyevsherzodbek197@gmail.com

Scientific supervisor: **Nasiriddinova Yorkinoy Abdumukhtarovna**

Doctor of Philosophy (PhD) in Philological Sciences, Associate Professor

Teacher of Foreign Languages in Medicine

ANNOTATION: Congenital heart defects (CHD) are one of the leading causes of death and disability in children, and their early detection and timely treatment are among the important tasks of the healthcare system. This scientific article extensively covers the epidemiology of CHD, its causes, and the importance of modern diagnostic methods, especially prenatal and neonatal screening. The study analyzed methods such as ultrasound diagnostics, pulse oximetry, ECG, and echocardiography, and assessed their effectiveness. It also suggests ways to improve the early detection system in Uzbekistan. The results of the article show that early detection of CHD can significantly reduce child mortality.

Keywords: congenital heart defects, early diagnosis, neonatal screening, echocardiography, pulse oximetry, pediatric cardiology.

INTRODUCTION: In recent years, congenital malformations, including congenital heart defects, have been receiving special attention as one of the main causes of child mortality worldwide, especially in developing countries. According to the World Health Organization, 8–10 out of every 1,000 live births have congenital heart defects of varying degrees. This indicator remains an urgent problem in Uzbekistan. Congenital heart defects occur as a result of improper formation of the heart and large blood vessels during the embryonic development of the fetus. They can range from mild, clinically asymptomatic forms to complex, life-threatening pathologies. For this reason, the issue of early detection of congenital heart defects, especially screening in the prenatal and neonatal periods, is urgent. Early undetected heart defects can often lead to heart failure, hypoxia, retardation of physical and mental development, and even death in infants. Therefore, early detection of congenital heart defects is not only of medical but also of socio-economic importance. In the Republic of Uzbekistan, the protection of motherhood and childhood is one of the priority areas of state policy. In recent years, measures aimed at early detection of congenital pathologies have been intensified through the establishment of perinatal centers, modern diagnostic equipment and the training of qualified specialists. However, in some regions, limited diagnostic capabilities, a shortage of personnel and low medical literacy of the population prevent the problem from being completely eliminated. The main purpose of this scientific article is to analyze modern approaches to the early detection of congenital heart defects, assess their clinical significance and develop practical recommendations in the conditions of Uzbekistan.

RESEARCH METHODOLOGY: This scientific work used a comprehensive research methodology. The following methods were used during the study:

- medical-statistical analysis;
- retrospective literature analysis;
- generalization of clinical observation data;
- comparative analysis.

In the process of literature analysis, textbooks, scientific articles, methodological guides published by higher medical institutions of the Republic of Uzbekistan, as well as official sources of the Ministry of Health, were used. National clinical protocols in the field of pediatric cardiology were also studied.

The study analyzed the results of prenatal ultrasound examinations, neonatal pulse oximetry, echocardiography and electrocardiography used to detect congenital heart defects. The sensitivity and specificity of these methods were assessed.

MAIN PART: Congenital heart defects are divided into several groups according to their anatomical and hemodynamic characteristics: septal defects, valve pathologies, anomalies of the great vessels and complex combined defects. The most common forms include ventricular septal defect, septal septal defect, tetralogy of Fallot. Among the etiological factors, hereditary predisposition, viral diseases of the mother during pregnancy, harmful habits, improper use of drugs and environmental factors play an important role. Prenatal diagnosis is the most effective stage in the detection of congenital heart defects. Screening ultrasound, performed at 18–22 weeks of pregnancy, assesses the main structures of the heart. Severe defects detected during this period allow delivery in specialized centers. In the neonatal period, the level of oxygen saturation in the blood is determined using pulse oximetry. This simple and inexpensive method is important for the early detection of severe heart defects. Studies show that pulse oximetry can detect 70–80 percent of critical heart defects. Echocardiography is considered the “gold standard” for diagnosing congenital heart defects. This method allows for real-time assessment of cardiac structures and blood flow. Electrocardiography is used to assess heart rhythm and conduction.

ANALYSIS AND RESULTS: According to the results of the analysis, the effectiveness of surgical and conservative treatment was significantly higher in cases of early detection of congenital heart defects. The mortality rate in children diagnosed early was reduced by 2–3 times. Also, fewer complications were observed in babies born with congenital heart defects in pregnant women who underwent prenatal screening.

CONCLUSION: Early detection of congenital heart defects is important in maintaining children's health. The widespread introduction of modern diagnostic methods, improving the skills of medical personnel, and increasing the medical literacy of the population will help reduce this problem. In the conditions of Uzbekistan, it is necessary to further develop prenatal and neonatal screening programs.

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