

## Congenital heart diseases with excessive pulmonary blood flow.

*Bòronova Guljahon Shuhrat qizi*

*Boboqambarova Feruzabonu Akbar qizi*

*Olimjonov Ziyodulla Abdulla ògli*

*Clinical Residents.*

*Samarkand State Medical University*

### Abstract

Congenital heart diseases (CHDs) associated with excessive pulmonary blood flow constitute a major group of cardiovascular abnormalities encountered in pediatric practice. These defects are characterized by left-to-right shunting of blood, resulting in increased pulmonary circulation, pulmonary vascular congestion, and volume overload of the heart chambers. Common lesions include ventricular septal defect, atrial septal defect, patent ductus arteriosus, and atrioventricular septal defect. If left untreated, these conditions may lead to pulmonary hypertension, heart failure, and irreversible pulmonary vascular disease. Advances in diagnostic imaging, interventional cardiology, and cardiac surgery have significantly improved patient outcomes. This review summarizes the pathophysiology, clinical manifestations, diagnostic methods, and contemporary management strategies for congenital heart diseases associated with excessive pulmonary blood flow.

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**Keywords:** congenital heart disease, pulmonary over circulation, left-to-right shunt, ventricular septal defect, atrial septal defect, patent ductus arteriosus, pulmonary hypertension, pediatric cardiology.

Congenital heart diseases are among the most frequently diagnosed congenital anomalies worldwide, affecting approximately 1% of live births. A substantial

proportion of these defects are associated with increased pulmonary blood flow due to abnormal communications between the systemic and pulmonary circulations. Such defects create left-to-right shunts, allowing oxygenated blood to recirculate through the pulmonary vasculature. The development of congenital heart diseases with excessive pulmonary blood flow is multifactorial and involves complex interactions between genetic predisposition and environmental influences. During embryonic development, disruptions in normal cardiac morphogenesis may result in structural abnormalities that create abnormal communications between cardiac chambers or great vessels. Genetic abnormalities play a significant role in the pathogenesis of congenital heart defects. Several chromosomal syndromes, including Down syndrome, Turner syndrome, DiGeorge syndrome, and Noonan syndrome, are frequently associated with cardiac malformations that produce left-to-right shunts. Advances in molecular genetics have identified numerous gene mutations involved in cardiac development, further highlighting the importance of hereditary factors. Maternal conditions during pregnancy may also increase the risk of congenital heart disease in offspring. Diabetes mellitus, viral infections such as rubella, exposure to alcohol, smoking, and certain medications have all been associated with an increased incidence of congenital cardiac anomalies. In addition, advanced maternal age and poor prenatal care may contribute to the development of congenital defects.

Although significant progress has been made in identifying risk factors, the precise cause remains unknown in many cases. Ongoing research continues to explore the genetic and environmental mechanisms underlying congenital heart disease, with the goal of improving prevention, early diagnosis, and targeted treatment strategies. Persistent pulmonary over circulation increases the workload of the heart and may result in congestive heart failure, pulmonary vascular remodeling,

and pulmonary hypertension. Early recognition and appropriate treatment are essential to prevent long-term complications and improve survival rates. The primary hemodynamic abnormality in these defects is the movement of blood from the high-pressure left side of the heart to the lower-pressure right side. This left-to-right shunt increases pulmonary blood flow and pulmonary venous return. Congenital heart diseases associated with excessive pulmonary blood flow are an important cause of morbidity in infants and children. Conditions such as ventricular septal defect, atrial septal defect, patent ductus arteriosus, and atrioventricular septal defect result in pulmonary overcirculation and may eventually lead to pulmonary hypertension and heart failure. Modern diagnostic techniques, including echocardiography and advanced imaging, facilitate early detection and accurate assessment. Contemporary treatment strategies involving medical therapy, catheter-based interventions, and surgical correction have dramatically improved survival and quality of life. Ongoing advances in pediatric cardiology continue to enhance outcomes for patients with these congenital cardiovascular disorders.

### References

1. Anderson R.H., Baker E.J., Penny D.J., Redington A.N., Rigby M.L., Wernovsky G. *Paediatric Cardiology*. 4th ed. Philadelphia: Elsevier; 2020.
2. Allen H.D., Driscoll D.J., Shaddy R.E., Feltes T.F. *Moss & Adams' Heart Disease in Infants, Children, and Adolescents*. 10th ed. Philadelphia: Wolters Kluwer; 2023.
3. Hoffman J.I.E., Kaplan S. The incidence of congenital heart disease. *Journal of the American College of Cardiology*. 2002;39(12):1890–1900.
4. Penny D.J., Vick G.W. Ventricular septal defect. *The Lancet*. 2011;377(9771):1103–1112.