key points

SELECTED BY

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Heart disease in children and adolescents can be congenital, in which structural defects of the heart and major blood vessels are present from birth, acquired, whereby disease develops during life, or genetic, including diseases affecting the heart muscle, electrical system or the aorta. The incidence of congenital heart disease has decreased over the past 30 years, with approximately 1 in 180 babies born with congenital heart disease in the UK each year. As treatment options have improved, and survival rates from surgical interventions have increased, there are now twice as many adults with congenital heart disease as children. A transthoracic 2D echocardiogram is the gold standard for investigating suspected congenital heart defects as it provides both the anatomical information and haemodynamic evaluation required for diagnosis.

Congenital heart disease is typically classified as cyanotic or non-cyanotic. Tetralogy of Fallot is the most common form of cyanotic congenital heart disease. The tetralogy of abnormalities includes: a large ventricular septal defect (VSD); right ventricular outflow tract obstruction; an overriding aorta and right ventricular hypertrophy. In transposition of the great arteries, as the name suggests, the aorta and pulmonary arteries are transposed, with the aorta rising from the right ventricle and the pulmonary artery from the left. Survival depends on the existence of a shunt, allowing oxygenated blood into the systemic circulation. Non-cyanotic congenital heart diseases include VSD, atrial septal defect and bicuspid aortic valve. VSD are observed in 50% of all children with congenital heart disease and are the most common congenital heart defects.

Several cardiac diseases are genetic and can manifest in childhood. Most are primary cardiomyopathies, ion channel diseases, coronary artery disease from familial hypercholesterolaemia or aortopathies. Hypertrophic cardiomyopathy is the most common cardiomyopathy, affecting 1 in 500 people. It is characterised by left ventricular hypertrophy in the absence of a cardiac or systemic cause. Dilated cardiomyopathy is inherited in up to 40% of cases and presents with heart failure and serious arrhythmias. Mutations within genes encoding sodium and potassium ion channels within the heart may cause a variety of sequelae including: Long QT syndrome, catecholaminergic polymorphic ventricular tachycardia and Brugada syndrome.

Acquired heart disease in young people is often precipitated by infection. A self-limiting systemic vasculitis, Kawasaki disease typically affects children aged six months to five years. Myocarditis, acute inflammation of the heart muscle, is implicated in 8.6% of cases of sudden cardiac death. Hypertension, diabetes, hypercholesterolaemia and obesity are major risk factors for cardiovascular disease and, as levels increase in young people, the cardiac health of future generations is at risk.