

CONGENITAL AND ACQUIRED HEART DISEASES

THE DIFFERENCE BETWEEN CONGENITAL AND NON-CONGENITAL HEART DISEASES



“The most important message I have is: there should be planned pregnancy and preconception counselling – It is very important for the mother and that is a service we provide.”

Dr. Geetha Kandavello, IJN's Senior Consultant Paediatric Cardiologist, not only specialises in paediatric cardiology but in Adult Congenital Heart Disease (ACHD)/Grown Up Congenital Heart (GUCH), cardiogenetic (Marfan/Aortopathy), Pulmonary Hypertension as well as heart diseases in pregnancy.

WHAT IS CONGENITAL HEART DISEASE?

Congenital heart disease (CHD) is any structural defects in the heart that can be detected during various stages of a patient's life. It can be diagnosed at birth, during foetal period, months after birth and even adulthood. Ultimately, it doesn't matter when they are diagnosed; congenital means the abnormality occurs during the formation of the baby's heart, around 8 – 10 weeks of pregnancy. At this point in time, causes of CHD is multifactorial so you cannot identify a particular cause unless you have evidence for it.

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Incidence of Congenital Heart Disease

0.8% - 1% of live births

WHAT ARE THE CAUSES OF CONGENITAL HEART DISEASE?

There are a number of possible causes of CHD. Spontaneous mutation, which is the most common reason, is when the CHD occurs spontaneously in the absence of any family history with CHD; unlike genetic transmission, where the risk of CHDs is higher in someone with family history of heart disease. Another contributing factor would be chromosomal anomalies resulting in Down Syndrome, Noonan Syndrome, or Turner Syndrome, commonly associated with CHD. Apart from chromosomal or genetic defects, organs can also be affected like the kidneys, eyes or gut.

Additionally, there are environmental factors that can cause CHD. Mothers with untreated infection like rubella, an illness caused by the RuV virus, uncontrolled diabetes, taking medications that are foetal toxic or lead an unhealthy lifestyle with alcohol consumption and abusing drugs during pregnancy can attribute to the increased risk of babies born with CHD. This is why it is strongly recommended for mothers to get these conditions under control before getting pregnant. Hence, the importance of immunisation and preconception counselling.

WHAT ARE NON-CONGENITAL HEART DISEASES IN CHILDREN?

Acquired heart disease, refers to patients who are born with a normal heart and somewhere along their life, whether as a baby, young child or older, are either infected or exposed to an infection that causes an auto-immune response which can cause heart disease in infancy or childhood.

Common Acquired Non-Congenital Heart Disease:

- **Kawasaki Disease (KD) or Kawasaki Syndrome**
An immune response occurs that cause inflammation of the coronary arteries
- **Acute Rheumatic Fever or Rheumatic Heart Disease**
An acute and recurrent inflammatory reaction to a bacterium which causes sore throat known as *Streptococcus pyogenes* (group A strep) which affects the joints, skin, brain and heart. This can cause damage to the heart valves causing narrowed or leaking valves and is referred to as Rheumatic Heart Disease

Hereditary Genetic Disorder

This is due to specific gene defects/abnormalities that causes dilatation of the aorta which is the main vessel supplying blood to the organs and can also affect the heart valves. The gene defect can happen either spontaneously or is transmitted from a parent to the child. Some common examples are

- **Marfan Syndrome**
Defect in Fibrillin-1 gene in Chromosome 15
- **Loey Dietz Syndrome**
Affects the gene in transforming growth factor-beta (TGF- β) pathway

WHAT CAN ONE DO TO AVOID THESE CONDITIONS FROM OCCURRING OR DETECT THESE HEART DISEASES EARLY?

1. Planned Pregnancy and Pre-Conception Counselling

- Folic acid should be taken before pregnancy to decrease risk of CHD and neural tube abnormalities
- Medication (antidepressants, antipsychotics, acne) should be changed or stopped to prevent risk of foetal toxic drugs causing congenital defects
- Medical issues like diabetes or hypertension needs to be controlled before pregnancy
- Maintain a healthy lifestyle to prevent complications in pregnancy e.g. avoiding alcohol and substance abuse, exercise, healthy diet
- Mothers should have their vaccination needs assessed to ensure full immunisation three months before pregnancy
- For those with family history of genetic complications, seek early counselling to understand potential risks involved

2. Screenings During Pregnancy

- Various tests (blood tests, ultrasound, DNA screening) are performed during pregnancy to identify potential anomalies in the foetus
- Mothers of advanced maternal age, more than 35 years of age, should undergo appropriate counselling for risk stratification of congenital and chromosomal abnormalities in the foetus
- At about 18 to 22 weeks' gestation, a foetal echocardiogram is recommended for pregnant women who have CHD or anyone with strong family history of congenital or heritable diseases

It is also important to have a detailed heart screening at birth for babies at risk of congenital or heritable heart disease or in any babies who have chromosomal abnormalities or are dysmorphic (abnormal facial or general features).

WHAT TREATMENT OPTIONS ARE AVAILABLE FOR CONGENITAL AND NON-CONGENITAL HEART DISEASE IN CHILDREN?

Depending on the type of heart defect or anomaly, options include medication e.g. aspirin and steroids for Kawasaki and acute rheumatic heart disease, heart failure medications for at risk patients with CHD and medications to control blood pressure and heart rate for patients with Marfan or Loey Dietz syndrome with dilated aorta.

Most patients with CHD require intervention controls either by surgery or non-surgical procedures. Similarly, patients with non-CHDs involving valves and dilated aorta may require surgery if there is worsening valve disease or dilatation.