

# Easy Steps of Management of Neonates with Congenital Heart Disease (CHD)

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## Neonatal Cardiology is the Most Important Segment of Pediatric Cardiology for Many Reasons as Follows

- Baby born with the Congenital Heart Diseases (CHD). So, all the congenital heart problems can be diagnosed in neonatal period by a thorough neonatal examination.
- CHD is an important cause of mortality and morbidity in newborn so early detection is mandatory.
- Treatment of many such severe problems are possible in neonatal period to save the life of newborn.
- Transcatheter interventions and surgeries of many such problems are available in neonatal period.
- Most of the patient with persistent fetal circulation, persistent pulmonary hypertension of newborn and complex CHD like TGA without shunt, tricuspid atresia, pulmonary atresia, Hypoplastic Left Heart Syndrome (HLHS) die in neonatal period.
- If fetal echocardiography predicts critical heart disease, then baby should be delivered in a center with facilities for immediate management.
- A team composed of neonatologist, pediatric cardiologist, pediatric cardiac surgeons, intensivists, obstetrician is necessary to deal with such critical cases.

## Early Suspicion can be Possible from Following Observations

- Presence of cyanosis.
- Respiratory distress.
- Unexplained shock/Acidosis.
- signs of Heart failure.
- Presence of murmur.
- Feeding difficulty with suck pause suck cycle.

## Initial work up for a suspected case of congenital heart disease

- Head to toe thorough clinical examination to exclude other anomalies or association with syndromes
- Hyperoxia test should be done to exclude cyanotic congenital heart disease.
- SpO<sub>2</sub> in all four limbs should be recorded to check any differential cyanosis.
- Blood pressure in all four limbs should be recorded to check any significant differences.

- e. Arterial blood gas analysis for sick babies to check acidosis or any metabolic derangement.
- f. Chest X-ray, electrocardiography and bedside echocardiography should be performed. echocardiography will provide accurate anatomical diagnosis.

#### Do's after suspicion or confirmatory diagnosis

- a. Refer the case to tertiary care center to a pediatric cardiologist if nothing can be done other than preliminary work up.
- b. Ensure safe transport of patient by ensuring maintenance of body temperature, nutrition, oxygenation and ventilation.

### Important Treatment Modalities for Newborn with CHD

Some patients are cured after medical management but some of them need advanced catheter intervention or surgical intervention. Following are the summaries of options currently available.

#### Medical treatment

- a) Injection Prostaglandin E1: To maintain patency of the ductus arteriosus in duct dependent CHD like pulmonary atresia, critical coarctation of aorta, critical pulmonary stenosis, interrupted aortic arch, Hypoplastic left or right heart syndrome etc.
- b) Injection Indomethacin, Paracetamol, Ibuprofen to close hemodynamically significant ductus arteriosus.
- c) Treatment of Supra ventricular tachycardia which may lead to dilated cardiomyopathy without treatment.
- d) Treatment of Heart Failure for any other reasons.
- e) Injection Isoprenaline for bradyarrhythmia.
- f) Treatment of Persistent Pulmonary Hypertension (PPHN) and Persistent Fetal Circulation (PFC).
- g) Treatment of shock, Acidosis, Spell.
- h) Stabilization of critically ill neonates for further interventions and surgeries.
- i) Nutritional management to gain body weight.

#### Transcatheter intervention

- a) Balloon atrial septostomy for creating reasonable atrial septal defect for mixing of blood in parallel circulation like transposition of great arteries.
- b) Patent Ductus Arteriosus {PDA} stenting to keep the ductus patent in duct dependent lesions.
- c) Balloon valvuloplasty for critical aortic and pulmonary stenosis.
- d) Balloon angioplasty for critical coarctation of aorta.

- e) Stenting of atrial septal defect for long lasting palliation.
- f) Pericardiocentesis for Pericardial effusion.
- g) Laser perforation or stiff wire perforation of atretic pulmonary valve.

#### Surgical treatment

- a) Palliative surgeries like Blalock Taussig Thomas shunt, Pulmonary artery Banding.
- b) Corrective surgeries like Coarctation repair, Interrupted aortic arch repair, Arterial switch operation, PDA ligation, Norwood first stage etc.

### Screening of New born

In some newborn babies, symptoms or signs are absent but they have possibilities of having cardiac lesions inside. These babies need screening to exclude CHD

- a. All downs syndrome baby.
- b. All baby with any other form of congenital malformations.
- c. Baby of diabetic mother.
- d. Baby of systemic lupus erythematosus(SLE) mother.
- e. All Preterm, IUGR and Low-birth weight baby.
- f. Mother with H/O teratogenic drug intake.
- g. Mother with H/O TORCH infection in pregnancy
- h. Family history of CHD.
- i. 9.Mother having history of abortion or fetal death.

### Well Baby Clinic

After taking all precautions and necessary measures, some cases are missed from detection in neonatal period. They need to be examined in well baby clinic during their routine checkup, All children should have pulse oximetry measurement of oxygen saturation in first checkup, should be auscultated for cardiac murmur, palpated for radio femoral delay and all peripheral pulses.

### Oxygen Therapy

Remember that oxygen is a drug and may cause side effects in newborn babies. Oxygen therapy without monitoring of surface SaO<sub>2</sub> may cause problems. It can cause heart failure in left to right shunt cases from pulmonary vasodilation can cause Bronchopulmonary Dysplasia (BPD) and Retrolental Fibroplasia which may lead to permanent blindness.

### Immunization

Immunization of all the young girl and woman of reproductive age with MMR vaccine can prevent Congenital Rubella Syndrome (CRS) in the fetus.