



CLINICO-ECHOCARDIOGRAPHIC PROFILE OF CONGENITAL HEART DISEASE IN CHILDREN ADMITTED IN TERTIARY CARE CENTRE

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ABSTRACT

Congenital Heart Disease (CHD) comprises one of the major diseases in pediatric age group and is one of the leading causes of death in children with congenital malformations.

This study aimed to assess spectrum and clinical presentation of congenital heart disease and to study clinico-echocardiographic correlation in CHD patients. In this prospective study all children (Term neonate to adolescents (0 to 19 years) with history and examination suggestive of congenital heart disease were included. Diagnosis was confirmed by echocardiography with color Doppler.

In this study 91 out of 99 clinically suspected cases were confirmed to have congenital heart diseases by 2D-echo with color Doppler. Acyanotic heart disease (73.6%) were more common than cyanotic CHD (26.4%) which was statistically significant (p value <0.001). Most common age of presentation was in infancy (65.94%) which was statistically significant (p=0.003). Most common presentation was breathlessness (82%) in acyanotic CHD patients. Cyanosis was the most common presentation in cyanotic CHD patients. Wasting was documented in 26 cases (28.57%) and Stunting in 18 (19.19%) cases which were statistically significant (p<0.001). Clinico-echocardiographic correlation was present in 57 out of 91 cases (62.6%).

So high index of suspicion, history, physical examination, chest x-ray and ECG along with 2-D Echocardiography & color Doppler helps to diagnose most of the Congenital Heart Diseases.

Key words: Congenital Heart Disease, cyanosis, 2-D Echocardiography, color Doppler.

INTRODUCTION

Congenital Heart Disease (CHD) comprises one of the major diseases in pediatric age group and is one of the leading causes of death in children with congenital malformations.⁽¹⁾ The incidence of CHD in the general population is 5–8 of 1000 live births. This does not include PDA in premature infants. The incidence is higher in stillborns (3–4%), spontaneous aborted

babies (10–25%), and premature infants (about 2% excluding patent ductus arteriosus [PDA]).⁽²⁾

Congenital cardiac defects have a wide spectrum of severity in infants: about 2-3 in 1,000 newborn infants will be symptomatic with heart disease in the 1st yr of life. The diagnosis is established by 1 wk of age in 40-50% of patients with congenital heart disease and by 1 mo of age in 50-60% of patients. With advances in both palliative and corrective surgery, the number of children with congenital heart disease surviving to adulthood has increased dramatically.

The burden of congenital heart disease in India is likely to be enormous, due to high birth rate. To detect as many children with CHD as possible, including those with mild lesions, very intensive studies are required which may not be available at all hospitals.

Rapid advances have taken place in the diagnosis and treatment of CHD over the last 6 decades. Foetal echocardiography can make accurate diagnosis of CHD even before birth. With currently available treatment modalities, over 75% of infants born with critical heart disease can survive beyond the first year of life and many can lead near normal lives thereafter.⁽³⁾

This study aimed to assess spectrum and clinical presentation of congenital heart disease and to study clinico-echocardiographic correlation in CHD patients.

MATERIAL AND METHOD

In this prospective study all children (Term neonate to adolescents (0 to 19 years) admitted in the department of Pediatrics, Jay Kay Lon Mother and Child Hospital of Government Medical College, Kota from October 2011 to September 2012 with history and examination suggestive of congenital heart disease were included. Pre-term infant of less than 37 weeks gestational age and children with Acquired heart disease were excluded.

All clinically diagnosed children in the age group of zero to 19 years of age with complaints of recurrent chest infection, respiratory distress, cyanotic spells, squatting episodes, poor feeding, failure to thrive & other relevant history and clinical findings suggesting CHD were first assessed clinically according to a preformed proforma & underwent routine investigations, chest x-ray, Electrocardiography. Diagnosis was confirmed by echocardiography with color Doppler.

RESULTS

In this study 91 out of 99 clinically suspected cases were confirmed to have congenital heart diseases by 2D-echo with color Doppler. Acyanotic heart disease (73.6%) were more common than cyanotic CHD (26.4%) which was statistically significant (p value <0.001). VSD was commonest acyanotic congenital heart disease accounted 53.7% of the total cases. Among Cyanotic heart defects, TOF was the commonest presentation accounting for 50% of the total cases. Most common age of presentation was in infancy (65.94%) which was statistically significant ($p=0.003$). There was male preponderance in this study but was statistically not significant ($p=0.07$). Most common presentation was breathlessness (82%) in acyanotic CHD patients. Cyanosis was the most common presentation in cyanotic CHD patients. Severe form of malnutrition was common in CHD. Wasting was documented in 26 cases (28.57%) and Stunting in 18 (19.19%) cases which were statistically significant ($p<0.001$). CHF and pneumonia were other complications found in our study. Incidence of congenital heart disease in our hospital was 6.24 per 1000 hospitalized patients. Clinico-echocardiographic correlation was present in 57 out of 91 cases (62.6%).

DISCUSSION

The present study was conducted in Jay Kay Lon Mother and Child Hospital, Kota for a period of one year from October 2011 to September 2012. A total of 14585 patients were admitted during the study period, out of which 101 cases were clinically suspected as congenital heart

disease. 2D- echo was done in 99 cases, out of them 91 cases were CHD, which were confirmed by echocardiography with color Doppler.

Incidence of congenital heart disease in our hospital was 6.24 per 1000 hospitalized patients. It correlates with the study done by Shah⁽⁴⁾ GS et al where they found an incidence of 5.8 per 1000 hospitalized patients.

In this study acyanotic CHD (73.6%) outnumbered cyanotic CHD (26.4%) cases, which was statistically significant (p value <0.001). Similar findings were reported by Ravinder K Gupta⁽⁴⁾ et al where they found acyanotic in 68% and cyanotic in 32% of the total cases.

In our study VSD as isolated or predominant lesion, is the most common congenital heart disease which account for 39.56% of the total cases. This was statistically significant (p <0.001). Membranous VSD is the predominant type of VSD documented in our study (77.8%) which was statistically significant (p <0.001). Similar findings were also reported by L ShamimaSharmin⁽⁵⁾ et al, Ravinder K. Gupta⁽⁶⁾et, Mahmoud U.Sani⁽⁷⁾ et al. where they document VSD as the commonest CHD with 42.6%, 32%and 45.9% of the total cases in their studies.

In this study VSD (39.56%) was most common acyanotic CHD followed by ASD (15.38%). And among cyanotic CHD TOF (15.38%) was the commonest presentation followed by TGA (4.39%). Our findings correlates with studies done by Ravinder K. Gupta⁽⁶⁾et al where VSD comprised 32% and ASD 16% in acyanotic group while cyanotic group had TOF (12%) and TGA (6%) as the common presentation. Similar findings were also reported in studies done by Sonali Tank⁽⁸⁾et al, L ShamimaSharmin⁽⁵⁾ et al and Mahmoud U.Sani⁽³⁾ et al.

In our study we found that the most common age of presentation of CHD was in infancy (65.94%), both in acyanotic (62.7%) and cyanotic (75%) groups which was statistically significant (p=0.003). And cyanotic CHD (75%) were reported more commonly in infancy as compare to acyanotic CHD (62.7%). These findings correlates with studies done in India^(8,9,10)and other parts of world.^(11,12,13,14)

In our study we found that 24.18% of the total cases were distributed in age group less than one month, 41.76% between one month to one year, 23.08% cases between one to five years and only 10.98% cases after five years of age.

Table-: Comparison of various studies according to age of presentation of CHD

Age	Our study N=91 (%)	Rashmi ⁽¹⁵⁾ et al N=281(%)	Sonali ⁽⁸⁾ et al N=147 (%)	ShahGS ⁽⁴⁾ etal N=84 (%)	Mahmoud U.Sani ⁽⁷⁾ N=122(%)
0-1 months	22 (24.18)	34(12.09)	16(10.88)	8 (9.5)	—
1-12 months	38 (41.76)	132(46.97)	58 (39.46)	39 (46.4)	41(33.6)
1-5 years	21 (23.08)	94(33.45)	42 (28.57)	26 (31)	43(35.2)
> 5 years	10 (10.98)	21(7.46)	31 (21.06)	11 (13.1)	38 (31.1)

In this study, dyspnea was the most common presenting symptom reported in 69.2% cases, followed by fatigue (62.6%), fever (59.3%), cough (54.9%), failure to thrive (42.8%), recurrent LRTI (35.1%), CCF (27.4%), cyanosis (26.3%), refuse to feed (17.5%), cyanotic spells(9.8%), and clubbing (15.3%). Recurrent LRTI was more common in acyanotic CHD which was statistically significant (p value <0.001).Cyanosis was the presenting complaint in all cases of cyanotic heart disease.Our findings correlates with study done by Sonali et al⁽⁸⁾ where they found breathlessness as the commonest symptom (74.83%) followed by LRTI (44.89) and FTT (38.77%). Similar findings were also reported in study done by L ShamimaSharmin⁽⁵⁾ et al.

Congenital heart defects were often associated with malnutrition and failure to thrive, the prevalence being as high as 64% in developed countries of the world⁸¹. In our study we found that 42.8% of the total cases were complicated by FTT and growth retardation. 45.8% of cyanotic CHD and 41.8% of acyanotic CHD cases were complicated by growth retardation. Our findings correlates with studies done by Sonali Tank⁽⁸⁾ et al where they found FTT in 39% and Jayant K Gosh⁽¹⁶⁾ et al where FTT is documented in 42% of their total cases.

Pneumonia is a well known complication of CHD especially with large left-to-right shunts. In our study we found that 30.8% of the total cases were complicated by pneumonia. We found that pneumonia was associated more commonly in acyanotic CHD (35.8%) as compared to cyanotic CHD (16.7%) which was statistically significant ($p < 0.001$). Out of four pneumonia cases in cyanotic group, three were associated with increased pulmonary blood flow (two cases of TGA with VSD and one HLHS with VSD).

In our study we found that CCF complicated 27.5% of the total CHD cases, which were more common in acyanotic CHD (34.3%) as compared to cyanotic CHD (8.3%). This finding was statistically significant ($p < 0.001$).

In this study pulmonary plethora was the dominant radiological finding 67 (73.6%), followed by cardiomegaly 53 (58.2%), pulmonary infiltration 28 (30.8%), oligemic lung field 16 (17.6%), and normal X-ray in 5 (5.5%) cases. In this study, out of 67 cases of acyanotic CHD 48 cases (71.6%) had cardiomegaly as a radiological finding while only 5 cases (20.8%) of the 24 cases of cyanotic CHD. This was statistically significant (P value < 0.001). Pulmonary plethora was present in 92.5% of acyanotic CHD cases as a dominant radiological finding as compared to only 20.8% of cyanotic CHD cases. Among the cyanotic CHD group, oligemic lung field was seen in 66.7% of the total cases. Boot shaped heart was present in 13 cases of TOF and Egg shaped heart in 3 cases of TGA.

We were able to detect primary defect on clinical grounds thereby emphasizing the clinico-echocardiographic correlation of congenital heart diseases. This correlation was found to a greater extent in acyanotic heart defects. Out of the total cases 47 cases of acyanotic CHD (70.15%) and 10 cases of cyanotic CHD (41.67%) had clinico-echocardiographic correlation. Therefore, the clinico-echocardiographic correlation was present in 57 out of 91 cases (62.6%).

In the cyanotic group clinical diagnosis of the lesions with increased or decreased pulmonary blood flow can be diagnosed on clinical grounds. But complex or multiple heart defects always require 2D echocardiogram for the confirmation of the defects.

CONCLUSION

CHD should be suspected in all cases of recurrent chest infection and failure to thrive. A high index of suspicion, a detailed history, physical examination, chest x-ray and electrocardiogram along with the use of 2-D Echocardiography & color Doppler helps us to diagnose most of the Congenital Heart Diseases.

CONFLICTS OF INTEREST

There are no conflicts of interest.

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