
Pattern of Cardiac Abnormalities in Children < 5 Years of Age - Experience in a Tertiary Care Hospital

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Abstract: *Background:* Congenital heart diseases (CHDs) are the most common birth defects, responsible for nearly one-third of all congenital birth defects. The birth prevalence of CHD is reported to be 8-12/1000 live births. Early diagnosis of Congenital as well as acquired heart diseases are of paramount importance for timely management plan and intervention and thus reduce the mortality and morbidity of childhood heart disease patients. *Method:* This is a prospective observational study carried out during January 2020 to December 2020 at Dhaka Shishu Hospital, Bangladesh. The study population were 100 enrolled cardiac children who were clinically suggestive of having cardiac disease evaluated through chest X-ray, ECG, Echocardiography and other necessary investigation. Proper informed consent was taken under the study and purpose of the study was explained. Ethical approval was obtained from the Institutional Ethics Committee. All data were processed, analyzed, and disseminated by MS Office and SPSS version 26 as per need. *Results:* Among the 100 enrolled cardiac patients 87 were diagnosed to have congenital heart disease and remaining 13% percent presented with acquired heart disease. Out of 87 patients suffering from congenital heart disease 59 (67.81%) had acyanotic heart disease where Ventricular septal defect (VSD) is in the top of the list 27 (31.34%). Cyanotic congenital heart disease was found in 28 (32.19%) where Tetralogy of Fallot (TOF) was the most common lesion 9 (10.34%). *Conclusion:* Childhood Heart diseases are responsible for a significant number of mortality and morbidity. Earlier detection and timely initiative regarding medical or surgical management is of utmost importance to avoid complications, reduce mortality and improve quality of life.

Keywords: Cardiac, Abnormalities, Tertiary Care

1. Introduction

Congenital heart disease (CHD) accounts for about 10% of newborn deaths and approximately half of all deaths due to congenital abnormalities in developed countries. [1] A gross structural abnormality of the heart or intrathoracic great vessels that is truly or hypothetically of functional significance. [2] In a country with a fertility rate of about eight per woman, the population has to support four times as many children with CHD as in a country with a fertility rate of two. [3] The incidence of CHD is generally considered to be 8 per 1,000 live births. [4] Acquired heart diseases (AHD) in children cause significant morbidity and mortality especially in low resource settings. [5] Congenital heart disease comprises structural abnormalities of the heart and great vessels present since birth though it may diagnose later.

[6] CHD constitute the greater percentage of the burden of cardiac diseases in children worldwide. Acquired heart diseases (AHDs) are those heterogeneous groups of disease that affect the heart and great vessels of children that were not present at birth but acquire sometime during the course of childhood. There are various types of AHDs, notable among them are Rheumatic heart disease, Myocarditis, pericardial effusion etc. Clinical presentation of congenital heart diseases is much variable, some may remain asymptomatic and diagnosed accidentally during routine physical examination most others may present with respiratory distress, feeding difficulty, CCF, cyanosis and clubbing growth failure etc. [7] Acquired heart are almost always symptomatic, may present with fever, sweating palpitation,

chest pain etc. Though many developed and western countries have well documented recorded data regarding heart disease in children. The scenario is quite different in developing countries like Bangladesh. Till now we have to depend on the data from western countries regarding the incidence, mortality and morbidities of heart disease in children. The purpose of this study was to assess the burden of childhood heart disease specially in under 5 years children. This study was carried out at Dhaka Shishu Hospital which is the largest paediatric care hospital in Bangladesh.

2. Objective

To assess the pattern of cardiac abnormalities of under five children in a tertiary level hospital.

3. Materials and Method

This is a prospective observational study carried out during January 2020 to December 2020 at Dhaka Shishu (Children) Hospital, Dhaka, Bangladesh. Patients aged up to 5 years were selected according to the inclusion and exclusion criteria and followed up our estimated total sample 100 who were clinically suggestive of having cardiac disease. The child treated cardiac abnormalities was a matter of exclusion. Detailed history and physical examination were performed for clinical confirmation of heart disease. Patient with heart failure and respiratory distress due suspected non-cardiac causes like anemia, pneumonia and malnourished children were excluded from the study. Proper informed consent was taken under the study and purpose of the study was explained. Ethical approval was obtained from the Institutional Ethics Committee. All data were processed, analyzed, and disseminated by MS Office and SPSS version 26 as per need.

4. Results

During one year study period between January 2020 to December 2020 total 100 patients were enrolled in this study. Congenital heart diseases were found slightly more in male than in female child, there was no sex predilection in case of acquired heart diseases. Among the 100 enrolled cardiac patient 87 were diagnosed to have congenital heart disease and remaining 13% percent presented with acquired heart disease. Out of 87 patients suffering from congenital heart disease 59 (67.81%) had acyanotic heart disease where Ventricular septal defect (VSD) is in the top of the list 27 (31.34%) and Atrial septal defect (ASD) is second in position 21 (24.13%). Cyanotic congenital heart disease was found in 28 (32.19%) where Tetralogy of fallot (TOF) was the most common lesion 9 (10.34%). Clinical presentation in acyanotic group of patients most commonly found as breathlessness, feeding difficulty, poor weight gain, and congestive cardiac failure. On the other hand, cyanotic group of patients mostly presented with cyanosis, clubbing, breathlessness, poor feeding and growth failure etc. Isolated VSD were found in 31.34% of cases and a small percent as

part of another complex cardiac lesion commonly with TOF and TGA. ASD were found as second highest in number among acyanotic heart disease seen in 24.13% patient. Most ASD were septum secundum in type and a small part septum primum type. Among the cases with cyanotic congenital heart disease TOF found to be the most common type 9 (10.39%) and TGA the next common type seen in 5 (5.74%) cases of congenital heart disease. A significant number cases 13% in this study shown to have acquired heart disease. Rheumatic heart disease is still highest in number followed by myocarditis, bacterial endocarditis pericardial effusion and supra ventricular tachycardia etc.

Table 1. Age at diagnosis of Heart Disease (N=100).

Age	No. of patient	Percentage
Newborn	20	20%
Infants	61	61%
Above 1 year up to 5 years	19	19%
Total:	100	100%

The table 1 shows age at diagnosis of heart disease where newborn 20 (20%), infants 61 (60%), above 1 year up to 5 years were 19 (19%).

Table 2. Clinical manifestation (N=100).

Clinical manifestation	No. Of Patients	Percentage
Fever	42	42
Breathlessness	77	77
Feeding difficulty	86	86
Not gaining weight	54	54
Palpitation	5	5
Congestive cardiac failure	18	18
Cyanosis	12	12
Clubbing	7	7
Hyper cyanotic spell	3	3
Asymptomatic	14	14
Total:	100	100%

The above table found as clinical manifestation among 100 patients are Fever 42%, Breathlessness 77%, Feeding difficulty 86%, Not gaining weight 54, Palpitation 5%, Congestive cardiac failure 18%, Cyanosis 12%, Clubbing 7%, Hyper cyanotic spell 7%, Hyper cyanotic spell 3% and Asymptomatic 14% accordingly.

Table 3. Types of heart disease (N=100).

Type of disease	No. of patients	Percentage
Congenital heart disease	87	87%
a. Congenital acyanotic heart disease	59	67.81%
b. Congenital cyanotic heart disease	28	32.19%
Acquired heart disease	13	13%
a. Rheumatic heart disease	5	38.46%
b. Viral myocarditis	3	23.07%
c. Bacteria endocarditis	2	15.38%
d. Pericardial effusion	2	15.38%
e. Supraventricular Tachycardia	1	7.69%

In the table 3 shown congenital heart disease 87%, congenital acyanotic heart disease 67.81%, congenital cyanotic heart disease 32.19%, acquired heart disease 13%, rheumatic heart disease 38.46%, viral myocarditis 23.07%,

bacteria endocarditis 15.38%, pericardial effusion 15.38% and supraventricular tachycardia 7.69%.

Table 4. Types of congenital heart disease.

Type of disease	No. of patients	Percentage
Ventricular septal defect (VSD)	27	31.34%
Atrial septal defect (ASD)	21	24.13%
Tetralogy of Fallot (TOF)	9	10.39%
Transposition of great arteries (TGA)	5	5.74%
Patent ductus arteriosus (PDA)	6	6.89%
Pulmonary stenosis (PS)	5	5.74%
AV Canal defect	3	3.44%
Combination of more than one lesion	8	9.19%
Dextrocardia with or without intracardiac lesion	3	3.44%

The above table found the types of congenital heart disease that are in percentages ventricular septal defect (VSD) 31.34%, atrial septal defect (ASD) 24.13%, tetralogy of Fallot (TOF) 10.39%, transposition of great arteries (TGA) 5.74%, patent ductus arteriosus (PDA) 6.89%, pulmonary stenosis (PS) 5.74%, AV Canal defect 3.44%, combination of more than one lesion 9.19% and dextrocardia with or without intracardiac lesion 3.44%.

5. Discussion

Earlier diagnosis of Congenital and acquired heart disease in children helps to have an opportunity of better treatment options and thus contribute to reduce the mortality and morbidity. This is a hospital based single center study probably not reflecting the true incidence or prevalence of paediatric heart disease in the community. In this study majority of patients 87% were diagnosed as congenital heart disease. The overall findings of heart disease as congenital and acquired heart disease correlates well where they found 89.3% patients with congenital heart disease and remaining 10.7% were suffering from acquired heart disease [8] According to the distribution of congenital heart disease in our study ventricular septal defect (VSD) was found as the most common acyanotic heart disease. This finding is quite comparable with many studies done in developing countries where prevalence of VSD ranges from 30 to 58% of congenital heart disease. [9, 10] The next common acyanotic heart disease was ASD found in 24.13% of cases. [11] Next common lesions were PDA found in 6.89% cases and pulmonary stenosis in 5.74% cases. [12] AV Canal defect seen in 3.44% cases. Out of 3 patients with AV Canal defect two were complete AV Canal defect with moderate to severe pulmonary hypertension; another one was diagnosed partial AV Canal defect. Patients of TOF were highest in number among cyanotic congenital heart disease followed by TGA. TOF seen in 11.34% cases. [13] Study at Atlanta found TGA in 5.74% cases, findings our study were similar. Dextrocardia seen in 3 patients, one case was dextrocardia with situs unversus with no other cardiac lesion, other two cases were dextrocardia with VSD and dextrocardia with VSD and ASD respectively. Though Rheumatic fever and Rheumatic heart disease are declining

in our country during last couple of years yet Rheumatic heart disease remains at the leading position of AHD. In our study we found Rheumatic heart disease in 38.46% of AHD. [14] Other notable AHD found in this study were Myocarditis, Bacterial endocarditis, pericardial effusion and one case with SVT.

6. Limitation of the Study

This is a single center study done on the admitted patient at pediatric medicine department of Dhaka Shishu Hospital. So, this study may not provide the representative information of prevalence of heart disease in general paediatric population.

7. Conclusion

Childhood Heart diseases are responsible for a significant number of mortality and morbidity. It imposes a tremendous psychological stress and economic burden to the whole family. Earlier detection and timely initiative regarding medical or surgical management is of utmost importance to avoid complications, reduce mortality and improve quality of life.

8. Recommendations

1. This is very necessary to provide the representative information of prevalence of heart disease in general paediatric population.
2. It is to recommend for conducting more studies regarding the same issue with larger sized sample and different hospitals as well.
3. Multicenter collective studies will help to improved define the pattern of cardiac abnormalities and there should be a converted focus on the prevention of CHD.

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