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Past and Present Pattern of Congenital Heart Disease at Dhaka Shishu Hospital: A Situation Analysis

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Abstract

Background: Congenital heart disease (CHD) is the most common congenital problem in children. In order to avoid complications, reduce mortality and for proper management early detection of congenital heart disease is of utmost importance.

Objectives: The purpose of this study was to find out a single tertiary center experience in disease pattern of CHD among children with comparative analysis of past and present situation.

Methods: This study was conducted over a period of 2 years from January 2008 to December 2009 prospectively and another 2 years data was collected from hospital records from January 1998 to December 1999 retrospectively on all patients with the confirmed diagnosis of CHD admitted in Dhaka Shishu Hospital to compare present and past status. Patients from 1st day of life to 12 years of age were included in the study.

Results: Acyanotic heart diseases were commonly found both in past and present (75% and 78.5% respectively) and among them Ventricular Septal Defect (VSD) was found the most common CHD (32.7% and 26.9% respectively). Atrial Septal Defect (ASD) was found 2nd most common CHD (25.6% and 21.2% respectively). Only 11.9% CHD were diagnosed during neonatal period in the past whereas 27.6% were diagnosed in the recent time. Rare CHD were detected more frequently in recent time.

Conclusion: VSD is the commonest non-cyanotic lesion whereas TOF is the commonest cyanotic lesion both in past and present, though their frequency reduced than before. Early detection and detection of rare CHD during recent time may reflect the advancement of diagnostic skill and facilities as well as awareness.

Key words: *Congenital Heart Disease, children.*

Introduction

Congenital heart disease (CHD) is the most common congenital problem accounting for nearly 25% of all congenital malformations and is the most common type of heart disease among children[1]. It may present in different ages from birth to adolescent[2]. Most cases are asymptomatic and discovered during routine neonatal check up[3]. As it is the most common amongst major birth defect, place a significant economic burden and psychological impact on the affected families and treatment is costly, it is very important to find out its pattern among children. In the western countries pattern of CHD is well documented[4], but has not been studied nationwide in Bangladesh as in other western and neighboring countries. It is not a static condition, changes takes place throughout patient's life.

Hussain et al[5] in early nineties found VSD (52.8%), ASD (11.1%), TOF (22.2%) and PDA (8.3%) as the commonest CHD. But Rahman et al[6] found ASD

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(39.9%) as common CHD followed by VSD (28.4%), TOF (28.6%) and PDA (5.2%) during the same period. Sharmin et al[7] during recent past found VSD in 42.6%, TOF 18.3% and ASD14.8%. During the same period Hoque et al[8] found VSD as the commonest CHD but Begum et al[9,10] found ASD as the commonest CHD in neonate. So, a variation in pattern of CHD is seen in Bangladesh in different time.

Over the past 30 years there has been an increasing awareness regarding the importance of early referral of newborn with heart disease to special centers. Continuous advances in technology and training in paediatric cardiology and paediatrics have improved long term outcome and promised better quality of life[10]. CHD if left untreated is an important cause of morbidity and mortality in children, therefore early detection and proper intervention is most important. But in Bangladesh there is still lack of awareness regarding health problems and lack of diagnostic facilities which make the detection of CHD difficult. The purpose of this study was to present and compare the experience regarding pattern of CHD in children during past and present in Dhaka Shishu Hospital, which is the largest paediatric teaching hospital providing care to the children from all over Bangladesh having 533 beds along with a well equipped Pediatric Cardiology Unit.

Materials and Methods

This study was conducted in Dhaka Shishu Hospital over a period of 2 years from January 2008 to December 2009 prospectively and another 2 years data was collected from hospital records from January 1998 to December 1999 retrospectively. Patients from 1st day of life to 12 years of age were included in the study. The cases were included after the clinical diagnosis of CHD and were confirmed by Color doppler echocardiography. Patients with acquired heart diseases such as rheumatic heart diseases or mitral valve prolapse were not included in this study. Consideration was given to total number of cases with CHD, age at diagnosis, sex distribution and type of CHD. Written consent was taken from parents and/or attendants from all enrolled patients following all ethical commitments. Data were analyzed by using SPSS version 12. Z test for proportion was applied to see the difference between CHD during past and present.

Results

Total 539 patients were diagnosed as CHD during January 2008 to December 2009 and out of them 148 (27.4%) were diagnosed during neonatal period, 196 (36.6%) during 1 month to 1 year and 121 (22.5%) during over 1 year to 5 years of age. Majority of the cases were diagnosed before 6 years of age. During January 1998 to December 1999, 312 patients were diagnosed as CHD but only 11.9% were diagnosed during neonatal period and majority of the cases were diagnosed during infancy (Table-I).

Table-I

Age distribution among the cases of CHD during Jan '98 to Dec '99 and Jan '08 to Dec '09 (n=312 and 539)

Age	Jan '98- Dec '99 N (%)	Jan '08-Dec '09 N (%)
0-28 days	37 (11.9)	148 (27.5)
1 month- 1 years	183 (58.6)	196 (36.4)
Over 1 year- 5 years	55 (17.6)	121 (22.4)
6 years - 10 years	27 (8.7)	69 (12.8)
Over 10 years	10 (3.2)	5 (0.9)
Total	312 (100)	539 (100)

Among 539 patients during January 2008 to December 2009, 364 were male and 175 were female with a male female ratio of 2.08:1. During January 1998 to December 1999 among 312 patients with CHD, 232 were male and 80 were female with a male female ratio of 2.9:1 (Fig.-1).

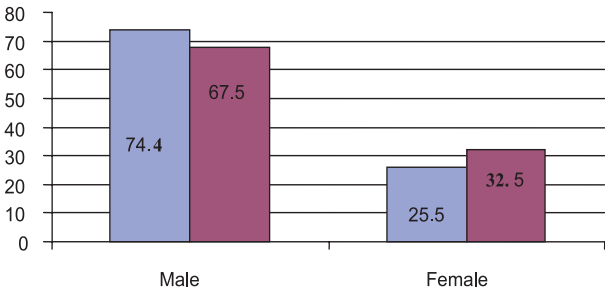

Fig.-1: *Distribution of sex between past and present among children with CHD*

Cyanotic heart disease was present in 21.5% cases during January 2008 to December 2009 and it was 25% during January 1998 to December 1999 (Fig.-2).

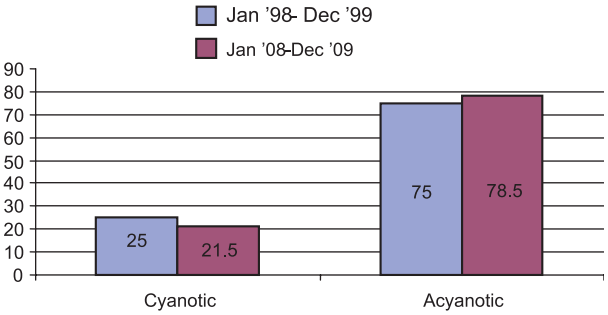

Fig.-2: *Distribution of cyanotic and acyanotic CHD during past and present*

During the period of January 1998 to December 1999 VSD was found in 32.7% cases followed by ASD in 25.6%, TOF in 15.1%, Patent Ductus Arteriosus (PDA) in 6.7% and Transposition of the Great Arteries (TGA) in 4.2%. During January 2008 to December 2009 VSD remains at the top of the list (26.9%) followed by ASD in 21.2%, TOF in 7.1%, PDA in 8.7% and TGA in 4.8% cases (Table-II).

Table-II

Pattern of CHD during Jan '98- Dec '99 and Jan '08- Dec '09

CHD	Jan '98- Dec '99 N (%)	Jan '08- Dec '09 N (%)
VSD	102 (32.7)	145 (26.9)
ASD	80 (25.6)	114 (21.2)
PDA	21(6.7)	47 (8.7)
TOF	47(15.1)	38 (7.1)
TGA	13 (4.2)	26 (4.8)
Pulmonary stenosis	6 (1.9)	24 (4.5)
AV canal defect	7 (2.3)	24 (4.4)
Double outlet right ventricle	2 (0.6)	4 (0.7)
Total anomalous pulmonary venous return	2 (0.6)	7 (1.3)
Single ventricle	-	3 (0.6)
Coarctation of the aorta	3 (0.9)	9 (1.7)
Aortic stenosis	9 (2.9)	20 (3.7)
Ebstain anomaly	-	5 (0.9)
Truncus arteriosus	-	4 (0.7)
Dextrocardia	3 (0.9)	7 (1.3)
Tricuspid atresia	-	4 (0.7)
Hypoplastic left heart syndrome	-	3 (0.6)
Others	17 (5.5)	55 (10.2)

VSD was present in 32.7% and 26.9% during January 1998 to December 1999 and January 2008 to December 2009 respectively. ASD was present in 25.6% and 21.2% during January 1998 to December 1999 and January 2008 to December 2009 respectively. Frequency of TOF was found less during January 2008 to December 2009 (7.1% and 15.1% respectively) and PDA became the 3rd most common CHD during this time (8.7% in comparison to 6.7%) (Fig.-3). Significant reduction in the frequency of VSD and TOF is found during January 2008 to December 2009 in comparison to January 1998 to December 1999 ($p<0.05$) and remain unchanged in ASD, PDA and TGA ($p>0.05$).

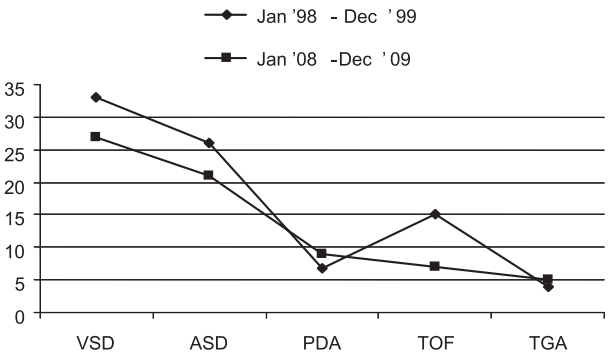

Fig.-3: *Comparison of top five CHD during past and present*

Discussion

The prevalence and the rates of occurrence of CHD in different reports vary due to duration and intensity of case finding, the sensitivity of the diagnostic method used and also the admission policies of the concerned hospitals. The use of color doppler echocardiography has helped in diagnosing even very small defects and has increased early detection rates. It is generally accepted that the improvement of diagnosis, attention or awareness among general pediatrician and early referral to pediatric cardiologists has resulted in an increase of reported prevalence of CHD[11,12]. During January 1998 to December 1999 total 312 patients were diagnosed as CHD and only 11.9% were diagnosed during neonatal period but during January 2008 to December 2009 27.5% CHD was diagnosed during neonatal period. Hussain et al[5] during early nineties found only 8.3% CHD at neonatal period. Similar result was found by Rahim et al[4] in Pakistan who detected only 8% CHD during neonatal period. Advancement of neonatal care and more availability of diagnostic facilities may be the cause of early

detection of CHD. Majority of CHD were diagnosed within 5 years of age but Hussain et al[5] found majority of CHD during infancy. Less then 15% CHD was diagnosed after 5 years of age, but Rahim et al[4] found 29.3% CHD after five years of age.

Acyanotic heart diseases were more common in this study both in past and present (75% and 78.5% respectively). Cyanotic heart disease was present in 21.5% cases during January 2008 to December 2009 and it was 25% during January 1998 to December 1999. Rahman et al[6] in their study found 84.4% acyanotic CHD. Similar result was found by Begum et al[10]. During recent time Sharmin et al[7] also found similar result in Bangladesh and Amro et al[13] found 74% of cases were acyanotic CHD and the remaining was cyanotic. Rahim et al[4] found one third of their CHD as cyanotic CHD.

Worldwide, VSD is the most common acyanotic CHD accounting for 25-30% of all CHD[14]. VSD was the commonest CHD in this study both in past and present (32.7% and 26.9%). Significant reduction in the frequency of VSD is found during January 2008 to December 2009 in comparison to January 1998 to December 1999 ($p<0.05$). Hussain et al[5] in their study found more then 50% cases as VSD 20 years back and Rahim et al[4] during 1997-98 found 46%. But in recent time Sharmin et al[7] in Bangladesh found 42% VSD in their study and Misra et al[15] found 28% VSD. But Rahman et al[6] found ASD as commonest CHD (39.9%) in the study conducted from 1982 to 1991. Begum et al[10] found ASD as the commonest CHD in neonate. Siddique et al[16] also found ASD as the commonest CHD about 20 years back.

In this study commonest cyanotic heart disease was TOF both in past and present (15.1% and 7.1%) but significant reduction in the frequency of TOF is found during January 2008 to December 2009 in comparison to January 1998 to December 1999 ($p<0.05$). TGA was the 2nd most common (4.2% and 4.8%) cyanotic CHD. This is comparable to world wide incidences (5-7%)[17]. Hussain et al[5], Rahman et al[6], Sharmin et al[7], Mollah et al[18] found similar result but Begum et al[10] and Hoque et al[8] in neonate found TOF and TGA in equal number.

Congenital heart diseases like Single Ventricle (SV), Hypoplastic Left Heart Syndrome (HLHS), Truncus Arteriosus, Tricuspid Atresia were less commonly found during January 1998 to December 1999. Along with these some other rare CHD were detected during recent time. It may be due to the advancement of cardiac facilities during recent time.

Conclusion

The majority of patients with congenital heart disease detected are non-cyanotic. TOF is the commonest cyanotic lesion and VSD is the commonest non-cyanotic lesion. Most of them are detected during infancy with increased rate of early detection during recent time along with detection of rare CHD. With the advancement of diagnostic facility and neonatal care, early detection of CHD is possible and may help to treat it at an earlier age and thus give the affected children and their parent's hope of a better future.

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