Original Article

Pattern of Heart Disease in Neonate Admitted in SCABU: Experience of Bangladesh Shishu Hospital & Institute

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Abstract

Background: *Like other developing countries, Bangladesh is facing a multitude of health problems and Congenital Heart Disease (CHD) is one of them. Without early recognition, diagnosis and treatment, a majority of infants and children with CHD die in their first month of life in developing countries.*

Objective: *This study was conducted to see the pattern of congenital heart disease in neonate admitted in SCABU.*

Methodology: *This cross sectional study was conducted in SCABU of Bangladesh Shishu Hospital & Institute from February 2020 to July 2020. Routine clinical examination was done within 24 hours of admission. All newborns recruited into the study were screened using transthoracic echocardiography by pediatric cardiologist after the initial evaluation. Neonates with CHD admitted during the study period were finally included. Data were collected and analyzed by using SPSS version 26.*

Results: *Total 47 neonates with CHD were admitted during the study period. Mean age were 9.03±7.26 days (range 1-28 days). Male were 55.32% and female were 44.68% with a male female ratio 1.2:1. Among the neonates term were 80.85% and preterm were 19.15%. A large group of neonate presented with cardiac murmur 15(31.92%), respiratory distress 20(42.55%), cyanosis 11(23.40%) and heart failure 1(2.13%). Majority of CHD were acyanotic (33, 70.21%) among them VSD 21.28%, ASD 25.53%, PDA 17.02%. Among cyanotic heart disease (8, 17.02%) TGA (4.25%), TOF (6.38%), pulmonary atresia (2.13%) and TAPVC (2.13%) were common. Among the neonates with heart disease 37(78.72%) were discharged, 5(10.64%) died, 5(10.64%) leave against medical advice.*

Conclusion: *This study shows that the most common acyanotic CHD in neonate in SCABU is ASD, VSD and PDA, and the most common cyanotic CHD is TOF and TGA.*

Keywords: *Congenital Heart Disease, pattern, neonate, SCABU.*

Paed. Heart J of Bangladesh (PHJB) 2021;6(1): 12-17

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[**Received:** 12 July, 2022 **Accepted:** 05 December, 2022]

Introduction

After commendable success in vaccine preventable diseases and overall reduction of communicable diseases, countries will face an epidemiological transition marked by a shift in the relative contribution of communicable and non-communicable diseases as major causes of childhood morbidity and mortality. In the next two decades, these changes are likely to occur in the 68 countries where current under 5 mortality is at least 35/1000 live births. As a result, most countries will see a steady increase in the relative importance of deaths due to congenital anomalies, non-communicable diseases, and injuries.[1]

Bangladesh is facing a multitude of health problems and congenital heart disease (CHD) is one of them. CHD occurs in 8 per 1000 live births.[2,3] CHD are serious conditions that have significant impact on morbidity, mortality. Without early recognition, diagnosis and treatment, a majority of infants and children with CHD die in their first month of life in developing countries.[4] So congenital malformations including CHD are now emerging as one of the leading cause of neonatal and under-5 mortality in Bangladesh. Without proper diagnosis and treatment, a majority of infants and children with cardiac disease both congenital and acquired die in developing countries and bear an increasing burden on health systems.

Hussain et al[5] during early nineties found only 8.3% CHD at neonatal period admitted in Dhaka Shishu (Children) Hospital. During January 1998 to December 1999 only 11.9% CHD were diagnosed during neonatal period and during January 2008 to December 2009 number increased to 27.5% in Dhaka Shishu (Children) Hospital.[6] A study at the Royal Brompton Hospital, in England, showed that most infants hospitalized with the diagnosis of CHD were neonates.[7] Recent data revealed 30% CHD was detected during neonatal period in Bangladesh.[8] That means diagnosis of CHD during neonatal period is increasing day by day. If these affected neonates left untreated causes serious morbidity and mortality, therefore early detection and proper intervention is most important.

The most common CHD has been ventricular septal defect, followed by atrial septal defect, patent ductus arteriosus, tetralogy of Fallot, single ventricle, atrium ventricular septal defect and double outlet right ventricle.[9] There are very few authentic data regarding the pattern of CHD at national level in Bangladesh. The objective of the study is to identify the pattern of congenital heart diseases in SCABU of Bangladesh Shishu Hospital & Institute.

Materials and methods

This cross sectional study was conducted in SCABU of Bangladesh Shishu Hospital & Institute from February 2020 to July 2020. Routine clinical examination was done within 24 hours of admission. This was recorded in a form that included the following parameters: Central cyanosis, murmur on chest auscultation, and respiratory distress. Furthermore, the field investigator for all newborns obtained non-invasive arterial oxygen saturation. Oximetry values were obtained from one of the feet of the baby. A persistent saturation of <95% were considered abnormal.

All newborns recruited into the study were screened using transthoracic echocardiography after the initial evaluation. A pediatric cardiologist performed echocardiography using the ultrasound system. The technique involved performing cross-sectional echocardiography, and Doppler and color flow imaging in various views. The cardiologist was not aware of the results of the initial clinical evaluation. Data were collected and analyzed by using SPSS version 26.

Results

Total 47 neonates with CHD were admitted during the study period. Mean age were 9.03±7.26 days (range 1-28 days). Male were 55.32% and female were 44.68% with a male female ratio 1.2:1 (Fig.-1). Among the neonates term were 80.85% and preterm were 19.15% (Fig.-2).

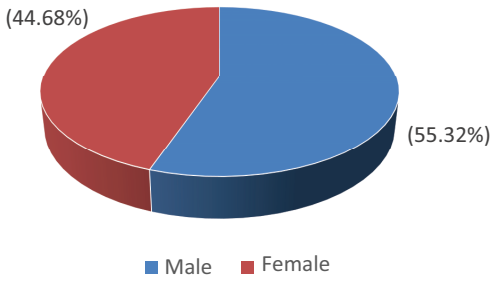

Fig.-1: *Distribution of sex of neonates in SCABU (n=47)*

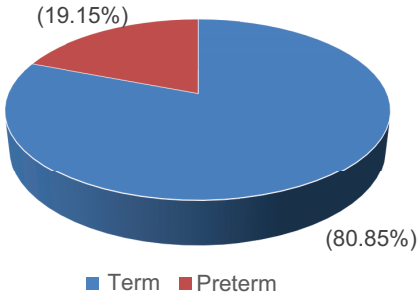

Fig.-2: *Distribution of gestational age of neonates in SCABU (n=47)*

A large group of neonate presented with cardiac murmur 15(31.92%), respiratory distress 20(42.55%), cyanosis 11(23.40%) and heart failure 1(2.13%) [Fig.-3].

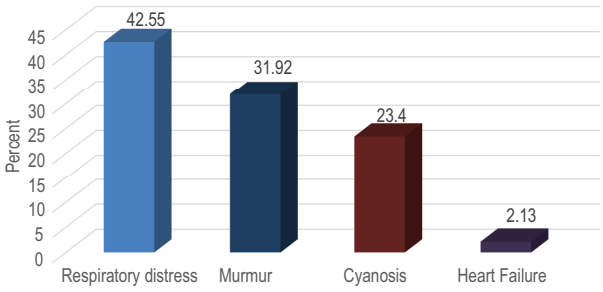

Fig.-3: *Distribution of clinical suspicion of CHD in neonate (n=47)*

Majority of CHD were acyanotic (33, 70.21%) among them VSD 21.28%, ASD 25.53%, PDA 17.02%. Among cyanotic heart disease (8, 17.02%) TGA (4.25%), TOF (6.38%), pulmonary atresia (2.13%) and TAPVC (2.13%) were common (Table-I).

Table-I

Distribution of heart disease among neonates in SCABU (n=47)

Diseases	Number (%)
Acyanotic CHD	33(70.21)
ASD	12(25.53)
VSD	10(21.28)
PDA	8(17.02)
AV Canal Defect	1(2.13)
Asymmetrical Septal Hypertrophy	2(4.25%)
Cyanotic CHD	8(17.02)
TOF	3(6.38)
TGA	2(4.25)
Pulmonary Atresia	1(2.13)
TAPVC	1(2.13)
HLHS	1(2.13)
Others	6(12.76)
PPHN	6(12.76)

*VSD: Ventricular Septal Defect, ASD: Atrial Septal Defect, PDA: Patent Ductus Arteriosus, AV canal defect: Atrioventricular canal defect, TOF: Tetralogy of Fallot, TGA: Transposition of Great Arteries, TAPVC: Total Anomalous Pulmonary Venous Return, HLHS: Hypoplastic Left heart Syndrome, PPHN: Persistent Pulmonary Hypertension of Newborn

Neonates were admitted with perinatal asphyxia (20, 42.55%), sepsis (13, 27.66%), prematurity (6, 12.77%), MAS (4, 8.51%), IDM (2, 4.25%), TTN (1, 2.13%) and RDS (1, 2.13%) (Fig.-4).

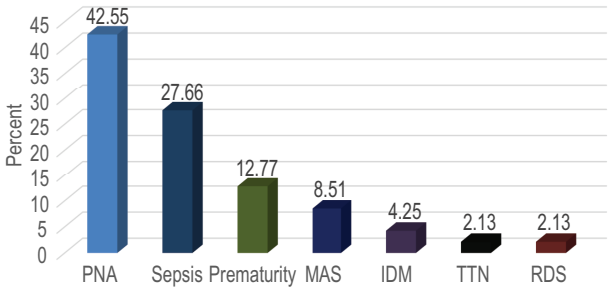

Fig.-4 *:Admission diagnosis of the neonates with HD*

Among the neonates with heart disease 37(78.72%) were discharged, 5(10.64%) died, 5(10.64%) leave against medical advice (Fig.-5). One neonate with VSD, 1 TGA, 1 PA, 1 HLHS and 1 PPHN died.

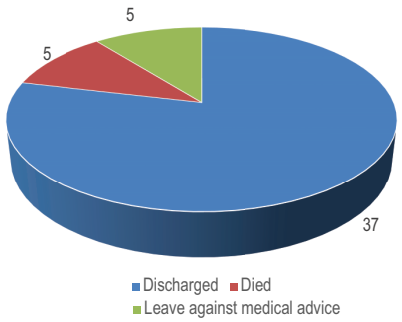

Fig.-5: *Distribution of outcome of neonates in SCABU (n=47)*

Discussion

Mean age of neonates were 9.03±7.26 days among them male were 55.32% and female were 44.68% with a male female ratio 1.2:1. Among the neonates term were 80.85% and preterm were 19.15%. A large group of neonate presented with cardiac murmur (31.92%), respiratory distress (31.92%), cyanosis (23.40%) and heart failure (2.13%). Majority of CHD were acyanotic (70.21%) among them ASD (25.53%), VSD (21.28%) and PDA (17.02%) were commonest. Among cyanotic heart disease TGA (4.25%), TOF (6.38%), pulmonary atresia (2.13%) and TAPVC (2.13%) were common. Majority (78.72%) were discharged, 10.64% died, 10.64% leave against medical advice. Majority of the neonates were admitted with perinatal asphyxia, sepsis, prematurity, MAS, IDM, TTN and RDS.

In this study, boys are outnumbered than girls with a ratio of 1.2:1. Rakkappan et al[10] in India found that CHD was more common in female births, which was very similar to the study conducted in Nigeria.[11] However, our finding is similar to that reported by Nikyar et al[12] from Gorgan, Iran where there is a male preponderance and found out the ratio of male:female is 1.35. Alabdulgader et al[13] from Saudi Arabia and Stephensen et al[14] from Iceland reported that the frequency was the same for males and females. In this study CHD was common among term neonate. Rakkappan et al[10] in India also found term neonates were affected more with CHD than preterms. In contrast to our study, Steurer et al[15] in California found out that preterm babies are at higher risk of CHD.

This study showed that majority of CHD are of acyanotic CHD. Among acyanotic CHD the pattern of CHD is ASD followed by VSD and PDA and among cyanotic CHD TOF was commonest followed by TGA and Pulmonary Atresia 2.13%. Rakkappan et al[10] in India showed that majority of CHD are acyanotic (97%) and among acyanotic CHD ASD was the commonest (52%), followed by PDA (40%) and VSD (10%). The most frequent type of CHD that this study found is ASD, which is in accordance with a recent study done in Saudi by Majeed-Saidan et al[16]. Furthermore, another study in Iran by Rahim et al[17] cited the most common CHD in the newborn as ASD, while in other studies, the most frequent type of CHD was VSD.[18-20] Uddin et al[21] in Bangladesh found that VSD was the most common type of acyanotic congenital heart disease followed by ASD and PDA. Among the cyanotic congenital heart disease, tetralogy of Fallot was the most common abnormality. Majeed-Saidan et al[16] reported the pattern as ASD, followed by VSD. In China among the live births, the top three lesions were ventricular septal defect (VSD), patent ductus arteriosus, and atrial septal defect, which accounted for 34.0%, 23.7%, and 10.8%, respectively.[22] In Bangladesh one multi-center study and one past and present situation analysis found that VSD remains at the top of the list followed by ASD, PDA, TOF and TGA. VSD was the commonest among acyanotic CHD and TOF was the commonest cyanotic CHD.[6,8]

A large group of neonate presented with cardiac murmur, respiratory distress, cyanosis and heart failure. There is a popular believe that murmur in neonatal period has no importance, it is a physiological phenomenon.[23] But it is not true at all times. Murmur in neonatal period may be the first sign of underlying serious structural cardiac defect. Uddin et al[21] have found the incidence rate of cardiac murmur is only 1.26%. These variations may be due to the examiners skills and experience,

the timing and frequency of examination. Mortality was high among neonates with complex congenital heart disease. Co morbid condition like prematurity, perinatal asphyxia and sepsis also contributed in higher mortality.

Conclusion

This study shows that the most common acyanotic CHD in neonate in SCABU is ASD, VSD and PDA, and the most common cyanotic CHD is TGA and TOF. Mortality is high among neonates with complex cyanotic heart disease.

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