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Single day Pattern of Cases reported to a Busy Paediatric Echocardiography Laboratory of a Tertiary care Hospital in Bangladesh.

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Abstract

Aim

To see the pattern of various types of heart diseases in children reported in a single day in a busy pediatric cardiology outpatient and echocardiography department.

Background: Congenital heart disease is a leading cause of morbidity and mortality in children. This study was conducted to see the disease pattern in children reported to a busy cardiac center in Bangladesh from across country. This is a single day hospital based observational study. All patients were examined clinically and with chest X-Ray. ECG was done where indicated. Final diagnosis was made using Echocardiography. All data were collected from Echocardiography laboratory at the end of that day. While compiling this report, a pattern was found among patients and since on that particular day, a lot of patients came from different parts of the country, representing the demographic of the whole country, the author decided to publish this experience.

Methods and findings

This was a single day survey of cases reported to a pediatric cardiac outpatient department of a tertiary care hospital in Bangladesh. All patients with suspected or confirmed congenital heart diseases were included in this study.

Out of 66 patients, 69.70% were male and 30.31% were female. Twenty five (41.66%) cases were in one month to one year age group, 21 (35%) in more than one year age group, 13 (21.66%) in more than 5 years age group, and seven (11.66%) in less than one month age group. Atrial septal defect (ASD) was seen in 10 (15.16%) cases, ventricular septal defect (VSD) in nine (13.36%) cases, patent ductus arteriosus (PDA) in eight (12.13%) cases, Tetralogy of Fallot in 3.03% cases. Down syndrome was present in two (3.03%) cases, congenital rubella syndrome and Cruzon syndrome in one (1.51%) case. The most common intervention was the device closure of PDA (7.57%) and VSD closure and PDA ligation were the most common surgical procedure. Most of the cases (43.93%) were kept in follow up, surgery was advised for nine (13.63%) cases and catheter intervention was advised for eight (12.13%) cases. Eight (12.13%) cases were discharged from follow up as they cured spontaneously.

Conclusion

Pattern of disease seen in a single day survey in a busy outpatient clinic showed similar pattern of other long-term studies. Most of the patients were kept in follow up as spontaneous cure may be achieved in some cases after follow-up.

Introduction:

Congenital heart disease (CHD) is defined as structural malformation of the heart or great vessels that is present at birth. Whatever may be the time of diagnosis CHD is the single most common malformation which constitute about 30% of the total [1-5]. Congenital heart defect may occur as an isolated form or in combination with others. Some of the defects are simple and some are complex. Major congenital heart defects (MCHD) are those of the heart or great vessels which necessitate surgical on catheter intervention in first six months of life. Pediatric cardiology was started as a subspecialty in Bangladesh in 1998 and initially pediatricians and public were not aware about existence of such a harmful disease in our community. Later, all concerned were educated by continuous medical education. A study conducted in Combined Military Hospital, Dhaka showed an incidence of 25/1000 live births in our country [4]. The Baltimore Washington infant study reported the rate as 4/1000 live births [5]. Less incidence in western country is contributed by fetal screening of heart in early pregnancy and abortion of diseased fetus play thereafter. Maternal health and nutritional status are also better in developed countries. Many hospital-based studies are conducted in many regions of the world but study in South Asia is limited. In this study, regional experience was highlighted [1,3,5]. This study has taken a cross section of patient for survey from a single day arrival in a tertiary care busy pediatric cardiac outpatient clinic of Bangladesh.

Methods

All the patient who reported as a referred case to a pediatric cardiologist of a tertiary care hospital on a busy day, 6 March 2017, was selected randomly. All the cases were seen by the paediatric cardiologist after a healthcare assistant measured the body weight and oxygen saturation of the patients. The cardiovascular system of every patient was examined thoroughly, and a provisional diagnosis was made. Chest x-ray and electrocardiogram (ECG) were advised in some of the cases and Echocardiography was advised for all cases for anatomical diagnosis of new cases or follow up of previous diseases or post-intervention and post-surgery follow up. Patients were documented in a non-invasive laboratory in database. Adults with chest pain who reported to the paediatric cardiologist were excluded from enrollment.

Data were analyzed in Microsoft Excel. Numerical data were expressed in frequency and categorical data as percentage. Comparative analysis was not required it is a single variant observational study.

Permission of ethical committee of the hospital was taken accordingly.

Results

Out of 66 cases, 46 (69.70%) were male and 20 (30.31%) were female (Fig I). Fig II showed age distribution of the subjects. Seven (11.66%) cases were in 0- 01 month age group, 25 (41.66%) were in more than one month to one year age group, 21 (35%) cases were in more than one year to 5 years age group and 13(21.66%) cases were in more than five years age group. Fig-III showed general distribution of cases reported on that day. Fifty-eight (87.88%) cases had congenital heart diseases of various types, five (7.57%) cases had normal heart and three (4.51%) cases had spontaneously closed simple CHD. Fig-IV showed 21% patient reported from greater Capital city and rest 79% from peripheral and rural area. Table I showed pattern of disease in studied cases. Ventricular Septal defect (VSD) was found in nine (13.63%) cases, Atrial Septal defect (ASD) in ten(15.16%) cases, Patent ductus arteriosus (PDA) in eight (12.13%) cases, Patent foramen ovale (PFO) in three (4.56%) cases. One VSD and two ASD secundum cases were cured spontaneously. Among combination form of simple congenital heart diseases, VSD with pulmonary stenosis (PS) was commonest (6.06%). Amongst cyanotic CHD variety, Tetralogy of Fallot (TOF) was commonest (3.03%) followed by transposition of great arteries (TGA) in 1.51% Pulmonary Atresia (PA) in 1.51%, double outlet right ventricle (DORV) in 1.51%, Truncus Arteriosus (TrA) in 1.51% and so on. Among Neonatal special situations, persistence pulmonary hypertension of newborn was seen in five (7.57%) patients. Fetal Echo and adult congenital Echo cases were not reported on that day. Table II showed association of syndromes in study cases. Down syndrome was seen in two (3.03%) cases, congenital Rubella syndrome in 1(1.51%) case and Curzon syndrome in one (1.51%) case. Table III showed position of the heart in cases analyzed. Levocardia was seen in 65(98.48%) cases and Dextrocardia in one (1.51%) case. Table IV showed post interventional follow up cases in study group. PDA device closure was found in five (7.57%) cases, PDA stenting in one (1.51%) case, pulmonary balloon valvuloplasty in 1(1.51%) case and medical intervention following a 3 days protocol for persistent pulmonary hypertension (PPHN) in 3(4.56%) cases. Table V showed surgical interventions in follow up cases. VSD closure and PDA ligation was performed in two (3.03%) cases, TOF repair, PDA ligation, Septal myomectomy, bidirectional glen shunt (BDG) for mitral Atresia and DORV were performed in one (1.51%) cases each. Table VI showed instant management plan provided after Echocardiographic diagnosis of patient. Medical management was offered in eleven (16.67%) cases, twenty nine (43.93%) cases were placed on follow up, trans catheter interventions were planned for eight (12.13%) cases, surgical intervention was planned for nine (13.63%) cases, eight (12.13%) cases were discharged as their Echo were normal or they cured spontaneously from simple diseases. One (1.51%) patient was found inoperable (AP window).

Discussion

Congenital heart disease is the commonest of all congenital malformation and accounts for highest morbidity. Incidence of congenital heart disease was studied amongst hospital live birth of Bangladesh and it was 25/1000 live birth [4]. In India, one study showed 3.9/1000 live birth are suffering from CHD [1,6-8]. In Pakistan the incidence is 4/1000 live birth [9]. Worldwide analysis of incidence study had a consensus of 8-10/1000 live birth. In our study male preponderance was noticed (Fig-I) which was also observed in other studies [1-4,10]. Most of the cases in this study fall in more than 1 month to 1 year age group (Fig-2). In other studies, most of the cases made their first visit to doctors in their first year of life. Studies by Nazma et al., Burki et al., Khalil et al. showed similar results [2,11-12]. About the pattern of disease (Table- I), the most common disease was ASD (15.16%), followed by VSD (13.63%) and PDA (12.13%). In Bangladesh ASD was found as the commonest acyanotic lesion in other studies also13. Among cyanotic heart diseases, TOF (3.03%) was the most common even on that single day which correlates with other studies in India, Pakistan and other countries [1-2,4,13- 14]. Most common combined lesion in this single day data analysis showed VSD and PS as commonest (6.06%) combination. Similar patterns were noticed in other studies [14]. Down syndrome was found as commonest syndrome in this study which correlates with others study also [15-18]. Medical and catheter intervention was performed in 10 (15.16%) cases (Table IV) and surgical interventions were performed in six (9.06%) cases. Other study also showed more interventions than surgery in current scenario [14]. Reason is most interventions are now coming up with good outcome and guardians of children always prefer non operative procedures on their children. Management plan (VI) was decided as per requirement of specific disease of the patient. Most of the cases were placed in follow up as they were mainly neonates and infants and time was given for spontaneous cure for simple lesions. Medical management was offered to patient with heart failure, pulmonary hypertension, and associated chest infection cases. Cases who were cured from previous simple CHD were discharged from follow up. Surgery was offered in some critical and complex cases and interventions were offered in feasible cases.

Single day experience in a busy Echocardiography laboratory of a tertiary care hospital reflects the scenario which has been observed over the years in countries. Varieties of cases representing the whole country give an information about how the cases are managed in a country like Bangladesh. Though complex and neonatal

surgeries are referred to neighboring countries, all kind of medical and catheter interventions are performed in our setup.

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Abbreviations

ASD Atrial septal defect

BDG Bidirectional glen shunt

CHD Congenital heart disease

DORV Double outlet right ventricle

ECG Electrocardiogram

MCHD Major congenital heart defects

PA Pulmonary Atresia

PDA Patent Ductus Arteriosus

PFO Patent foramen ovale

PPHN Persistent pulmonary hypertension

PS Pulmonary stenosis

TOF Tetralogy of Fallot

TGA transposition of great arteries

TRA Truncus Arteriosus

VSD Ventricular Septal defect

Fig I: Sex distribution of patient N=66

Fig II: Age distribution of patient

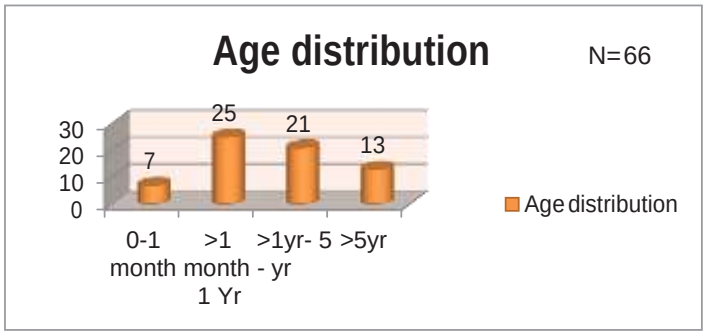

Fig III: Distribution of patient

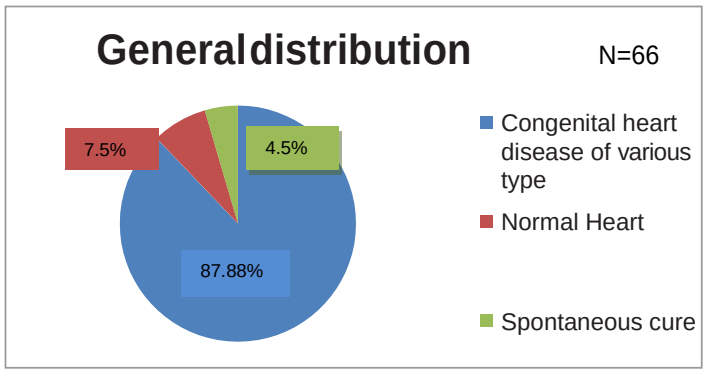

Fig IV: Distribution of patient based on locality

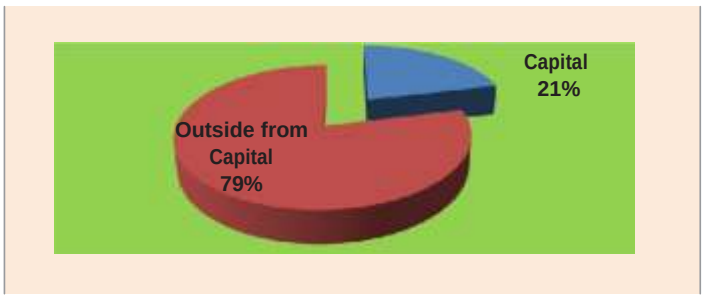

Table I: Disease pattern of study cases

N=66

A. Acyanotic Congenital Heart disease	Number	Percentage
1. Ventricular Septal Defect(VSD) – one cured	09	13.63
2. Atrial Septal Defects (ASD)- two cured	10	15.16
3. Patent ductus arteriosus (PDA)	08	12.13
4. Patent foramen ovale (PFO)	03	4.56
5.Pulmonary stenosis PS	01	1.51
6. Idiopathic Pulmonary Arterial Hypertension (IPAH)	01	1.51
7. ASD+ PS	02	3.03
8. VSD+ PS	04	6.06
9. VSD + PDA	03	4.56
10. Atria Ventricular canal defect(AV Canal)	02	3.03
11. Mitral Atresia, Ventricular Septal Defect, Atrial Septal Defects	01	1.51
12. Flow acceleration Pulmonary valve	02	3.03
13. Hypertrophic obstructive cardiomyopathy (HOCM)	01	1.51
14. LPA, RPA Stenosis	02	3.03
B. Cyanotic Congenital Heart disease		
1.Tetralogy Of Fallot (TOF)	02	3.03
2.Trans position of great Arteries (TGA)	01	1.51
3.Pulmonary Atresia, ASD, PDA	01	1.51
4.Doulde out let right ventricle (DORV), VSD, PS	01	1.51
5.Persistent pulmonary hypertension newborn (PPHN)	05	7.57
6.Truncus Arteriosus	01	1.51
7.Aorto pulmonary window (AP Window)	01	1.51
C. Other finding		
1.Normal Echo	05	7.57

Table II: Association with syndromes

N=66

Name of syndrome	Number	Percentage
1. Down syndrome	02	3.03
2. Cruzon syndrome	01	1.51
3. Congenital Rubella syndrome (CRS)	01	1.51

Table III: Position of heart N=66

Name of heart position	Number	Percentage
1. Dextrocardia	01	1.51
2. Levocardia	65	98.48

Table IV: Types of post intervention follow up in study cases N=66

Name of intervention	Number	Percentage
1.PDA stenting for Pulmonary Atresia	01	1.51
2. Medical Intervention For PPHN followed by complete cure	03	4.56
3.PDA device closure	05	7.57
4.Pulmunar Balloon valvoplasty	01	1.51

Table V: Type of post-surgical follow up in study cases N=66

Name of surgery	Number	Percentage
1.Septal Myomectomy	01	1.51
2. PDA Ligation	01	1.51
3.VSD closure+ PDA ligation	02	3.03
4.TOF repair	01	1.51
5. BDG+ Atrial Septostomy + MPA ligation for MA, DORV, PHT	01	1.51

Table VI: Instant management plan provided after Echocardiography N=66

Name of Management	Number	Percentage
1.Medical management (anti failure, prophylaxis for cyanotic spell)	11	16.67
2.Follow up in pediatric card OPD	29	43.93
3. Need transcatheter intervention, cardiac catheterization.	08	12.13
4. Need Surgical correction	09	13.63
5.Discherged from cardiac follow up	08	12.13
6.Inoperable (AP window)	01	1.51

Note: Sixteen patients already completed treatment