Original Article

Patterns and Associated Factors of Congenital Heart Disease in Children at a Tertiary Care Hospital Jaipur, Rajasthan

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DOI:10.37821/ruhsjhs.6.2.2021.319

ABSTRACT

Introduction: Congenital heart disease (CHD) is the commonest of all congenital lesions. Its prevalence ranges from 4 to 19/1,000 live births. It has a greater impact on children's morbidity and mortality, as well as on the health system's costs. This study aimed at evaluation of pattern, clinical profile, and associated factors of congenital heart diseases in children.

Methodology: 210 CHD cases were evaluated and diagnosed by echocardiography, detailed history, and clinical examination of cases. Difference in proportion and means were inferred with chi square test and unpaired-t-test.

Result: Majority (72%) cases were suffering from simple acyanotic CHD. Commonest acyanotic CHD found was atrial septal defects (ASD) followed by ventricular septal defects (VSD). Only one fourth cases had cyanotic CHD. Tetralogy of fallot (TOF) and dextro-transposition of the great arteries (d-TGA) were generally found cyanotic CHDs. Fever and respiratory symptoms were common complaints. Commonest extra cardiac malformation was craniofacial anomalies.

Conclusion: Simple acyanotic CHDs were more prevalent. Commonest was ASD followed by VSD. TOF and d-TGA were dominant cyanotic CHD. Respiratory symptoms were widely present.

Keywords: Acyanotic, CHD, Clinical, Cyanotic profile, Extra-cardiac anomaly, Pattern.

INTRODUCTION

Congenital heart disease (CHD) is the commonest of all congenital lesions among children. The incidence is 6-8 per 1000 live births with a higher rate in still birth, spontaneous abortion, and prematurity.[1,2] The prevalence of CHD has been increasing due to greater detection of minor defects by the widely used Doppler echocardiography.[3] Most cases of congenital heart disease were thought to be multifactorial as a result of combination of genetic predisposition and environmental stimulus. Extra-cardiac malformations (EM) such as intra-abdominal organs defects or associated with genetic syndromes were observed in 7 to 50% of the patients with CHD and impose a greater risk of morbidity and mortality to these patients, in addition to increasing the risks of surgical correction.[4] However, with improved medical and surgical management, more children with CHD are surviving into adolescence and adulthood. Thus, there is a need for an awareness of the pattern and profile of such cases reported at tertiary care hospital. The objective of this study was to describe pattern, clinical profile, and associated factors of congenital heart diseases in children.

METHODS

This observational study was conducted on CHD cases, attending four hospitals associated with a government medical college in Rajasthan. Total 210 children below 18 years were enrolled from August 2015 to July 2016. The sample size calculated was 210 cases at 95% confidence and 5% absolute error to verify the expected minimum 13.3% of CHD cases were of Fallots tetralogy.[5] Detailed history taking and clinical examinations were performed. Age, sex, extra-cardiac anomaly, and geographical distribution were noted. X-ray, electrocardiography, and USG were done. The diagnosis of CHDs was confirmed by pediatric echocardiography. All ECHO confirmed CHD

Table 1: Different type of congenital heart disease (CHDs) in different age group of study participants

CHD	Age group				Total
	0-1 month No. (%)	1-12 months No. (%)	1 -3 years No. (%)	>3 year No. (%)	No. (%)
ASD	42 (37.2)	54 (47.8)	14 (12.4)	3 (2.6)	113 (53.8)
VSD	20 (20)	54 (54)	15 (15)	11 (11)	100 (47.1)
PDA	23 (52.3)	17 (38.6)	0 (0)	4 (9.1)	44 (20.9)
TOF	2 (12.5)	6 (37.5)	6 (37.5)	2 (12.5)	16 (7.6)
TAPVR	2 (22.2)	7 (77.8)	0 (0)	0 (0)	9 (4.3)
TGA	3 (30)	3 (30)	3 (30)	1(10)	10 (4.3)
Common AV Canal defect	2 (33.3)	3 (50)	1 (16.7)	0 (0)	6 (2.9)
DORV	1 (16.7)	2 (33.3)	1 (16.7)	2 (33. 3)	6 (2.9)
Tricuspid Atresia	1 (25)	1 (25)	1 (25)	1 (25)	4 (2.4)
Pulmonary Atresia	0 (0)	4 (80)	1 (20)	0 (0)	5 (2.9)
COA	1 (50)	1 (50)	0 (0)	0 (0)	2 (0.9)
Ebstein Anomaly	0 (0)	1 (100)	0 (0)	0 (0)	1 (0.4)
Truncus Arteriosus	0 (0)	1 (100)	0 (0)	0 (0)	1 (0.4)

*(one defect is counted as one), ASD: Atrial Septal Defect, VSD: Ventricular Septal Defect, PDA: Patent Ductus Anteriosus, TOF: Tetralagy of fallot, TAPVAR: Total Anomalous Pulmonary Venous Retrun, TGA: Transposition of the Great Arteries, DORV: Double Oattet Right Ventricle, COA: Coarctation of the Aorta

cases below18 years of age were included. Children having functional lesions like PFO and small PDA, those having acquired heart diseases, and who refused to give consent were excluded from study.

Statistical analysis: A pre designed and pre tested structured questionnaire was used to collect information. Continuous data were summarized in form of mean and SD. Count data were summarized in form of proportions. Difference in proportion was inferred with chi square test. Difference in mean was inferred with un-paired 't' test. The level of significance was kept 95% for all statistical analysis.

RESULTS

There were 122 (58%) males and 88 (42%) females out of total 210 patients observed. Respiratory symptoms were present in around 73% followed by fever (50%), cyanosis (46%), poor weight gain (36%), difficulty in feeding (23%), poor play activity (3.3%), and palpitation. The most common CHD found was ASD (54%) followed by VSD (47.1%), PDA (20.9%), and TOF(6%). Majority cases (75%) were of acyanotic CHD. Around 73% of them were simple and complex acyanotic disease was present only in 27%. More than one CHDs were seen in many cases i.e. ASD+VSD (34.9%), ASD+PDA (34.9%), VSD+PDA (13.9%), and ASD+VSD+PDA (16.3%) (Table 2 and 3). There were total 51 cases of cyanotic CHD. Commonest (29.4%) of them were of TOF followed by TAPVC (8), TGA (7), DORV (6), and pulmonary atresia (5).

DISCUSSION

Present study observed that majority (75%) of cases was acyanotic CHD. This is comparable to findings of Suguna Bai et al (74%)[6], Mohammad et al (74.6%)[7], Suresh et al (77.9%)[8], and Abqurli et al (72.5%).[9] Current study also observed that 73% of acyanotic CHD cases were simple and 27% cases were complex CHD. Similarly, Kapoor and Gupta (78%)[10] and Nikyar et al (69%)[11] observed majority

Table 2: Age wise distribution of simple acyanotic congenital heart disease (CHD) cases

CHD	Age group				Total
	0-1 month No. (%)	1 month – 1 year No. (%)	1 -3 years No. (%)	> 3 year No. (%)	(n = 116) No. (%)
ASD	18 (62.0)	26 (49.1)	11 (45.8)	1 (10.0)	56 (48.3)
VSD	7 (24.2)	26 (49.1)	13 (54.2)	7 (70.0)	53 (45.7)
PDA	4 (13.8)	1 (1.8)	0 (0)	2 (20.0)	7 (6.0)
Total	29 (100)	53 (100)	24 (100)	10 (100)	116 (100)

ASD: Atrial Septal Defect, VSD: Ventricular Septal Defect, PDA: Patent Ductus Arteriosus

Table 3: Age wise distribution of complex acyanotic congenital heart disease (CHD) (Multiple lesions)

	Age group				Total
	0-1 month No. (%)	1month–1 year No. (%)	1–3 years No. (%)	> 3 years No. (%)	(N = 43) No. (%)
ASD+VSD	2 (10.0)	10 (50.0)	2 (100.0)	1 (100.0)	15 (34.9)
ASD+PDA	9 (45.0)	6 (30.0)	0 (0)	0 (0)	15 (34.9)
VSD+PDA	2 (10.0)	4 (20.0)	0 (0)	0 (0)	6 (13.9)
ASD+VSD+PDA	7 (35.0)	0 (0)	0 (0)	0 (0)	7 (16.3)
	20 (100)	20 (100)	2 (100.0)	1 (100.0)	43 (100)

ASD: Atrial Septal Defect, VSD: Ventricular Septal Defect, PDA: Patent Ductus Arteriasus

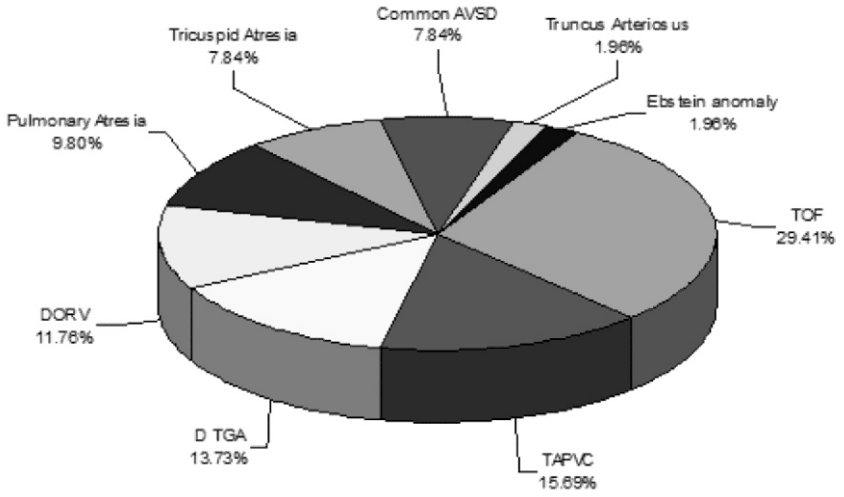

Figure 1: Pattern of Common Cyanotic congenital heart diseases (CHD) in study group.

Table 4: Age and sex pattern of congenital heart disease cases

Sex	Age group				Total	
	0 – 1 month No. (%)	1 month – 1 year No. (%)	1-3 years No. (%)	>3year No. (%)	(N = 210) No. (%)	χ^2, P value
Female	22 (37.3)	42 (41.2)	17 (51.5)	7 (43.7)	88 (41.9)	χ^2=1.838,
Male	37 (62.7)	60 (58.8)	16 (48.5)	9 (56.3)	122 (58.1)	P = 0.838
Total	59 (100)	102 (100)	33 (100)	16 (100)	210 (100)	

cases were simple acyanotic CHD. Nikyar et al[11] and Suresh et al[8] reported that ASD was the commonest lesion. Bhat et al[12] and Tank et al[13] described that ventricular septal defect was seen in 30% and 28%, respectively followed by ASD in 17.63%, 10.8% and PDA in 9.62%, 4.7% cases of CHDs**.** Tank et al[13] and Nikyar et al [11] observed 73 and 66 simple acyanotic CHD cases, ASD (56.2% and 46.9%), VSD (21.9% and 15.2%), and PDA (9.6% and 22.7%). Bhat et al[12] also observed that TOF was the most common (5.45%) cyanotic congenital heart defects followed by transposition of great arteries in 5.13% cases. In our study, TOF was present in 7.6% of total cases of CHD which is similar with observations made by Sawant et al[14], Ashraf et al[15], and Burki et al[16] who reported VSD were the most common lesion (relative frequency 61.4%) followed by TOF, ASD and PDA with a relative frequency of (8.77%). The primary presentation was respiratory complaints (72.8%), followed by fever (50.5%). Tank et al[13] found that breathlessness was most common presenting complaint (74.83%) among CHD cases. Our study observed 28.1% cases were below one month of age and majority (48.6%) were below one year of age, similarly Burki et al[16] reported 28.07% cases under one month and 75.43% up to one year of age. We observed that majority (92%) reported were below three years of age, similar to Kapoor et al[10] who also reported that maximum (82.9%) number of cases were diagnosed

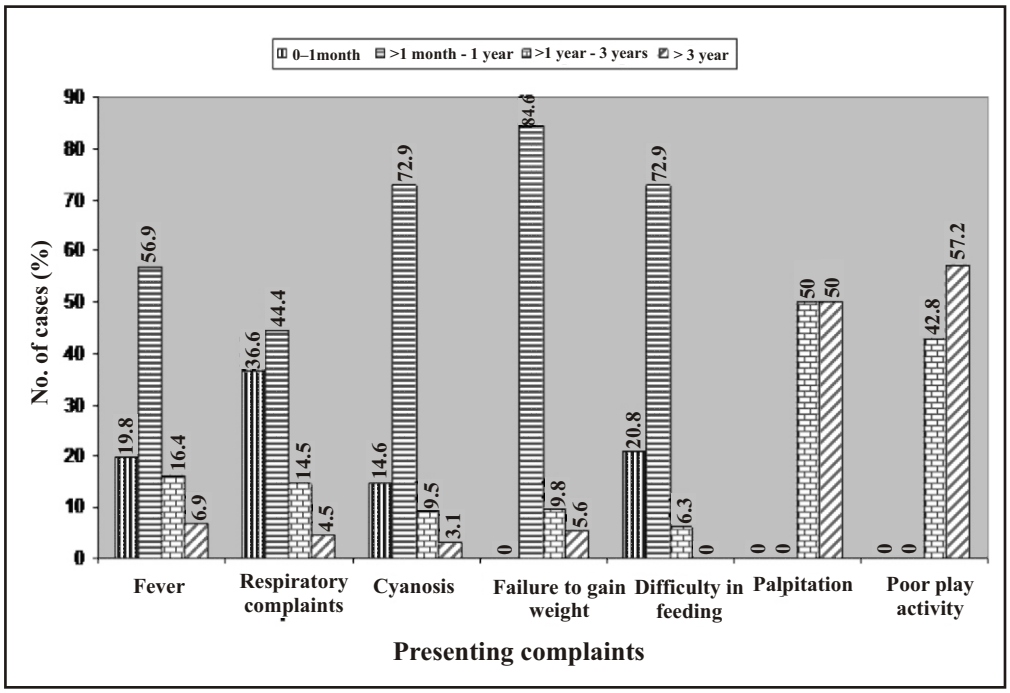

Figure 2: Presenting complaints in congenital heart disease (CHD) cases.

between 0-3 years of age. In current study, 58% were male and male female ratio was 1.4:1. Quite similar to Tank et al[13] who observed that around 60% were male with a male: female ratio of 1.88:1.

CONCLUSION

Simple acyanotic CHDs like ASD and VSD were found in majority CHD cases. Subsequently TOF and d-TGA were common acyanotic CHDs observed. Craniofacial anomalies were frequently associated extra cardiac malformation. Respiratory symptoms were generally present along with cardiomegaly on CXR.

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