

Incidence and Pattern of Congenital Heart Disease in Children - a Hospital Based Study

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Abstract: Congenital Heart Disease (CHD) comprises one of the major diseases in pediatric age group. Congenital Heart Disease is a leading cause of morbidity and mortality in children. Present study was aimed to find out the clinical profile of children admitted with congenital heart disease in a tertiary care hospital. It was a hospital based observational study. Duration of study was 1 year starting from June 2014 to May 2015. All children between age group 1 month to 12 years, admitted in pediatric department over a period of one year were included in the study. History and clinical examination was done and disease was suspected in patient having cardiac murmur, presence of cyanosis, feeding difficulties, cyanosis associated with feeding difficulties, clubbing, features of congestive cardiac failure, or failure to thrive. Final diagnosis was confirmed by Echocardiography, then analysed to know the pattern of congenital heart disease. Total admission in pediatrics ward during period of study was 3359. Total number of children admitted with congenital heart disease was 82. Incidence of congenital heart disease was 2.44%. The findings of the present study were comparable to other previous studies.

I. Introduction

Congenital Heart Disease (CHD) comprises one of the major diseases in pediatric age group. Among the all congenital malformations, Congenital Heart Disease is leading cause of morbidity and mortality in children.¹ Congenital heart disease by definition is the structural abnormalities of heart or intra-thoracic great vessels present since birth that is actually or potentially of functional significance regardless of the age of detection (Mitchell et al, IJP, April 2013)¹.

The reported prevalence of congenital heart diseases (CHD) ranges from 1.01 to 17.5 per 1000 live births according to various studies over the world^[2-4]. In India, the prevalence of CHD is 2.25-5.2 per 1000 children⁵. In India, the incidence of CHD is 3.9/1000 live births, as reported by a Khalil et al in a hospital based study⁶. In community based studies from India the prevalence of CHD ranges from 0.8-5.2/1000 children^[6-7]. Nearly 1/3rd of the congenital heart diseases (CHD) are critical requiring interventions in the first year of life⁶. 7% of the neonatal deaths are due to congenital malformations, 25% of which are cardiovascular⁸. In India, 10% of the present infant mortality may be accounted for by Congenital Heart Disease as reported by Saxena et al⁷. The profile of Congenital Heart Disease varies with the age group studied. Simple and potentially correctable heart defects like Ventricular Septal defect (VSD), Atrial Septal Defect (ASD) and patent ductus arteriosus (PDA) were common at all the ages.

The varied structural abnormalities in congenital heart diseases fall primarily into three major categories

- a) Malformations causing a left to right shunt.
- b) Malformations causing right to left shunt.
- c) Malformations causing an obstruction.

Left To Right Shunts: The most commonly encountered left to right shunts include;

- a) Atrial septal defect.
- b) Ventricular septal defect.
- c) Patent ductus arteriosus.
- d) Atrioventricular septal defects.

Right To Left Shunts: These are the cyanotic group of diseases. Here are the commonly encountered right to left shunts.

1. Tetralogy of Fallot.
2. Transposition of great arteries.
3. Persistent truncus arteriosus.
4. Tricuspid atresia.

Obstructive Congenital Abnormalities: Congenital abnormalities to blood flow may occur at the level of heart valves or within a great vessel. The common examples are;

1. Coarctation of aorta.
2. Pulmonary stenosis and atresia.
3. Aortic stenosis and atresia.

Present study was aimed to find out the clinical profile of patients admitted with congenital heart disease in a tertiary care hospital.

II. Materials and Methods

The present study was a hospital based observational study. Duration of study was 1 year starting from June 2014 to May 2015. The study was conducted after taking clearance from ethical committee of SrimantaSankaradeva University of Health Sciences. All children between age group 1 month to 12 years , admitted in pediatric department over a period of one year from June 2014 to May 2015 were included in the study. Informed consent was taken from parents or caregivers & a thorough history and clinical examination was carried out and congenital heart disease was suspected in patient having cardiac murmur, presence of cyanosis, feeding difficulties, cyanosis associated with feeding difficulties, clubbing, features of congestive cardiac failure, or failure to thrive.

Study group was first assessed clinically according to a preformed proforma including sex and age of presentation & undergone routine investigations, chest x-ray, ECG and Electrocardiography. Final diagnosis was confirmed by Echocardiography, then analysed to know pattern of congenital heart disease.

Inclusion Criteria- Children of age group 1 month to 12 yrs, first time diagnosed for CHD and admitted in pediatric department,GMCH.

Exclusion Criteria

1. -Old cases already evaluated by echocardiography and came for follow up.
2. -Children with acquired heart disease.
3. -Unstable patients who died before the confirmation of diagnosis.
4. -Congenital arrhythmia (Wolff-Parkinson-white syndrome,Long QT syndrome)
5. -Documented hydrops foetalis.
6. -Functionless abnormalities of great vein (persistent left superior venacava)

III. Result and Observation

Total admission in pediatrics ward during period of study -3359 Total number of children admitted with congenital heart disease is- 82 Incidence = 2.44%

Table no:1 Incidence of acyanotic heart disease.

Acyanotic heart disease	No	Percentage
Ventricular septal defect	33	40.2%
Atrial septal defect	10	12.2%
Patent ductus arteriosus	3	3.6%
Atrioventricular septal defect	2	2.4%
Pulmonary stenosis	3	3.6%

Table no:2 Incidence of cyanotic heart disease

Cyanotic heart disease	No	Percentage
Tetralogy of fallot	16	19.5%
Pentalogy of fallot	1	1.2%
Tricuspid atresia	4	4.9%
Transposition of great artery	3	3.6%
Total anoamalous pulmonary circulation	1	1.2%
Double outlet right ventricle	4	4.9%
Complex lesion	2	2.4%

Table no3:Agewise distribution of various congenital heart disease.

Age group	VSD	TOF	ASD	TA	TGA	TAPVC	PFO	PDA	DORV	PS	AVD	Complex lesion
1-12 month	28 (34.1%)	6 (7.3%)	5 (6%)	2 (2.4%)	3 (3.6%)	1 (1.2%)	1 (1.2%)	3 (3.6%)	3 (3.6%)	3 (3.6%)	2 (2.4%)	2 (2.4%)
1-5 years	5 (6%)	8 (9.7%)	1 (1.2%)	1 (1.2%)	0	0	0	0	0	0	0	0
5-12 years	0	2 (2.4%)	4 (4.8%)	1 (1.2%)	0	0	0	0	1 (1.2%)	0	0	0

Table no4: Gender distribution of acyanotic and cyanotic congenital heart disease.

Sex	ACHD	CCHD
Male	32(39%)	23(28%)
Female	19(23.1%)	8(9.7%)

Table no5:Agewise distribution of acyanotic and cyanotic congenital heart disease

Age group	ACHD	CCHD
1-12 months	41(50%)	18(21.9%)
1-5 years	6(7.3%)	9(10.9%)
5-12 years	4(4.8%)	4(4.8%)

Table no6:Gender distribution of various congenital heart disease

Sex	VSD	TOF	ASD	TA	TGA	TAPVC	PFO	PDA	DORV	PS	AVSD	Complex lesion
Male	20 (24.3%)	1 (1.2%)	5 (6%)	1 (1.2%)	2 (2.4%)	1 (1.2%)	0	3 (3.6%)	3 (3.6%)	2 (2.4%)	2 (2.4%)	1 (1.2%)
Female	13 (15.8%)	15 (18.3%)	5 (6%)	3 (3.6%)	1 (1.2%)	0	1 (1.2%)	0	1 (1.2%)	1 (1.2%)	0	1 (1.2%)

Table no7: comparison of the finding of present study with others

Author/References	Total no. of admission	Total no. of CHD case	VSD	ASD	PDA	AVSD	PS	TOF	PFO	TA	TGA	TAPVC	DORV	PA	Complex Lesion
Kasturi L et al,1999 ⁹		108	29 (27%)	26 (24%)				10 (9%)							
Mohammed S et al,2006 ⁽¹⁰⁾	1023	89	46 (51.8%)	3 (3.4%)	12 (13.5%)		4 (4.45%)	16 (17.9%)			8 (8.9%)				
Memom Y et al,2007 ⁽¹¹⁾		80	42 (52.5%)	7 (8.75%)	6 (7.75%)	3 (3.75%)	3 (3.75%)	7 (8.75%)			3 (3.75)				2 (2.5%)
Borzouee M et al,2008 ⁽¹²⁾	2341	1817 (77.7%)	427 (28%)	147 (9.2%)	139 (9.1%)		184 (12.1%)	201 (13.2%)		32 (2.1%)	47 (3.1%)	7 (0.46%)		31 (2%)	105 (6.9%)
Shah et al,2008 ⁽¹³⁾	14461	84	49 (53.3%)	6 (7.1%)				11 (13.1%)			1 (1.2%)	3 (3.6%)			
Jatav R.K et al,2014 ⁽¹⁴⁾	13554	116	33 (28.4%)	21 (18.1%)	12 (10.3%)	4 (3.44%)	7 (6.03%)	7 (6.03%)		1 (0.86%)	4 (3.44%)	2 (1.72%)		3 (2.58%)	
Hajela S et al,2014 ⁽¹⁵⁾		100	29 (58%)	13 (26%)	5 (10%)	1 (2%)	1 (2%)	26 (56%)			9 (18%)	4 (8%)	3 (6%)		5 (10%)
Kumar B et al,2015 ⁽¹⁶⁾		50	16 (32%)	8 (16%)	5 (10%)			9 (18%)			3 (6%)				4 (8%)
Present study, 2015,	3359	82 (2.44%)	33 (40.2%)	10 (12.2%)	3 (3.6%)	2 (2.4%)	3 (3.6%)	16 (19.5%)	1 (2%)		3 (3.6%)	1 (2%)	4 (4.9%)	4 (4.9%)	2 (2.4%)

Table no8:Comparison of the finding of present study with others

Author/References Number	Total no. of admission	Total no. of case	Incidence	Male (N. & %)	Female (N. & %)
Mohammed S et al,2006 ⁽¹⁰⁾	1023	89	8.6%		
Memom Y et al,2007 ⁽¹¹⁾		80		50 (62.5%)	30 (37.5%)
Borzouee M et al,2008 ⁽¹²⁾	2341	1380	76% M/F :: 1.3/1		
Shah et al,2008 ⁽¹³⁾	1446	84	5.8%	51 (60.7%)	33 (39.3%)
Jatav RK et al,2014, ⁽¹⁴⁾	13554	116	0.855%	72 (62.068%)	44 (37.93%)
Hajela S et al,2014 ⁽¹⁵⁾		100	1.53%	59%	41%
Kumar B et al,2015 ⁽¹⁶⁾		50		32 (64%)	18 (36%)
Present study, 2015	3359	82	2.44%	55 (67.07%)	27 (32.92%)

IV. Discussion

The findings of the present study were comparable to all the previous studies except for the study done by Borzouee M et al. The incidence in Borouee M et al was found to be high. This discrepancy could be attributable to the fact that the study index was taken from the Deptt. of Cardiology,

V. Conclusion

Present study was a hospital based observational study with 82 children of age group 1 month to 12 years suspected of congenital heart disease and definitive diagnosis was made by 2-D Echocardiography. Majority of cases presented belong to <1 yr age group followed by 8 – 12 yrs age group. Male predominance

over female was seen in the presentation of congenital heart disease. Among the cases taken for the study, acyanotic heart anomalies were more common cardiac anomalies. Among which Ventricular Septal Defect was the commonest defect and 2.4% cases were observed with complex lesions i.e. presenting with a mixed variety of congenital heart anomalies. Presence of murmurs was also evaluated in each and every case, which gave a clinical suspicion of congenital heart disease.

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