

## PATTERN OF CONGENITAL HEART DISEASES IN CHILDREN AT RURAL HOSPITAL OF CENTRAL INDIA

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**Abstract:** It was hospital based study conducted over a period of two year from July 2004 to June 2006. Methods: 129 children up to twelve year of age with clinical suspicion of congenital heart disease were subjected to chest X-ray and electrocardiography while the final diagnosis was confirmed by echocardiography. 72(56%) were male and 57(44%) female children. 82% of children with congenital heart disease presented at age less than 5 years and only 18% at age above 5 years. Among the acyanotic congenital heart disease group, ventricular septal defect was the commonest lesion found in 29% of cases, followed by atrial septal defect 18%. Perimembranous ventricular septal defect and ostium secundum atrial septal defect were the commonest type detected on echocardiography. Tetralogy of Fallot was the commonest cyanotic lesion found in 8.52% followed by complex congenital heart disease in 5.42% and transposition of great arteries in 3.10% of cases. In order to avoid complications, early detection of congenital heart disease is of utmost importance for proper management.

**Keywords:** Congenital heart disease, Acyanotic, Cyanotic, Echocardiography.

### INTRODUCTION

Congenital heart disease (CHD) is defined as the structural, functional or positional abnormality of the heart, in isolation or in combination present from birth, but may manifest any time after birth or may not manifest at all. A study on 11,000 consecutive live births in a tertiary care hospital in Delhi gave as incidence of CHD as 3.9/1000 live birth, whereas in an autopsy study from Chandigarh, the incidence was as high as 7.5/1000 births<sup>1</sup>. In our country majority of childbirths still takes place at home and routine neonatal screening is not common, so it's very difficult to calculate true birth prevalence of congenital heart disease. Until 1930 it was believed that rheumatic heart disease was the most common form of heart disease in children. Within recent years, the statistics in most cardiac centres have shown that CHD is the more common of the two<sup>2</sup>. Congenital heart diseases may present in any age group from neonatal age to adolescent age group and it may present with or without cyanosis, rapid breathing, perspiration, some with congestive cardiac failure, cyanotic spells, while some children may be asymptomatic but with a cardiac murmur detected during examination for any other illness<sup>3</sup>. This study was conducted to determine the profile of individual congenital heart lesions in cyanotic as well as acyanotic patients at rural hospital.

### MATERIAL AND METHODS

This study was conducted in Department of Pediatrics, Mahatma Gandhi Institute of Medical College, Sewagram over a period of two year from July 2004 to June 2006. All the children with clinical suspicion of Congenital Heart Disease were evaluated with detailed history and clinical examination. They were initially investigated by performing complete blood cell count, chest X-ray and electrocardiography and final diagnosis was confirmed by echocardiography. **Inclusion criteria:** 1. Children up to 12 years of age; 2. Suspicion of congenital heart disease. **Exclusion criteria:** 1. Age more than 12 years.; 2. Children with acquired heart disease.

### RESULTS

Total of 129 children were included in this study. Age group ranged from newborn to 12 years. 82% of children with congenital heart disease presented at age less than 5 years and 18% in age group of 6 to 12 years (Table 1). 72(56%) children were males and 57(44%) were females. Male to female ratio was 1.26:1 (Table 2). Two-thirds of children were having acyanotic congenital heart lesions. The response of mother of the children with CHD to antenatal history eg. H/O irradiation or drug or hormonal ingestion, exanthematous fever, six months prior to conception was

Table - I: Age distribution of CHD children

Age distribution of CHD children		
Age group	No. of Cases	Percentage
0-1month	18	13.95
1month - 1 year	41	31.78
1year - 5year	49	37.98
5year- 10year	14	10.85
10year-12year	7	5.42

Table2: Relative distribution of congenital heart diseases lesion in children

CHD Lesions	Total Number (n=129)	Male (n=72)	Female(n=57)	Ratio (M:F) (1.26:1)
<b>1. Acyanotic CHD</b>				
ASD	24	13	11	1.18:1
VSD	38	24	14	1.71:1
PDA	7	1	6	0.16:1
ECD	5	3	2	1.5:1
Mixed	6	4	2	2:1
<b>2. Obstructive CHD</b>				
PS	5	3	2	1.5:1
AS	2	1	1	1:1
COA	1	1		
<b>3. Cyanotic CHD</b>				
TGA	4	3	1	3:1
TOF	11	4	7	0.57:1
Ebstein's anomaly	2	2	0	-
TA	3	2	1	2:1
PAPVC	2	2	0	-
TAPVC	2	1	1	1:1
Single Ventricle	2	1	1	1:1
<b>4. Complex CHD</b>				
	7	4	3	1.33:1
<b>5. Miscellaneous Condition</b>				
	8	3	5	0.6:1

VSD: Ventricular septal defect, ASD: Atrial Septal Defect, PDA: Patent ductus arteriosus, ECD: Endocardial cushion defect, COA: coarctation of aorta AS: Aortic stenosis, PS: Pulmonary stenosis, TOF: Tetralogy of Fallot, TGA: Transposition of great vessels, TA: Tricuspid Atresia, EA: Ebstein's anomaly, TAPVC: Total anomalous of pulmonary venous connection, LCAPA: left coronary artery arise from pulmonary artery

unreliable to establish possible causative factor. Family history was positive in 8(6.20%) cases with CHD. Family studies indicate a 2 to 10 fold increase in the incidence of CHD in sibling of affected parents or in the offspring of the affected parents<sup>4</sup>. Therefore, it's recommended that family members of patients with CHD should also be screened for early detection and treatment.

Symptoms started in infancy in 92% of patients. The commonest symptoms were breathlessness, palpitation, failure to thrive, repeated chest infection and cyanosis; 9 (6.97%) patients had extracardiac malformation

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in which more than one system was involved. 92(71.31%) patients were anemic. 63 (48.83%) patients fall in PEM grade III and 33 (25.58%) in PEM grade II. Among the acyanotic CHD group, ventricular septal defect (VSD) was the commonest lesion found in 29% of cases, followed by atrial septal defect 18%. Perimembranous VSD and ostium secundum ASD were the commonest type of lesion detected on echocardiography. Tetralogy of Fallot (TOF) was the commonest cyanotic lesion found in 8.52% followed by transposition of great arteries in 3.1% and Tricuspid atresia in 2.32% of cases. Complex congenital heart disease was found in 5.42% of cases (Table 3).

**Table 3:** Relative distribution of congenital heart diseases lesion in children:

CHD	Total Number(n=129)	Percentage (%)
<b>1. Acyanotic CHD</b>		
<b>ASD</b>	<b>24</b>	<b>18</b>
Ostium Primum	4	
Ostium Secundum	19	
Sinus Venosus	1	
<b>VSD</b>	<b>38</b>	<b>29</b>
Perimembranous	25	
Muscular	10	
Inlet	2	
Swiss-Chiese	1	
<b>PDA</b>	<b>7</b>	<b>5.42</b>
<b>ECD</b>	<b>5</b>	<b>3.87</b>
<b>Mixed</b>		
PDA+VSD	1	0.77
PDA+ASD	1	0.77
ASD+VSD	4	3.1
<b>2.Obstructive CHD</b>		
<b>PS</b>	<b>5</b>	<b>3.87</b>
<b>AS</b>	<b>2</b>	<b>1.5</b>
<b>COA</b>	<b>1</b>	<b>0.77</b>
<b>3. Cyanotic CHD</b>		
<b>TGA</b>	<b>4</b>	<b>3.1</b>
<b>TOF</b>	<b>11</b>	<b>8.52</b>
<b>Ebstein's anomaly</b>	<b>2</b>	<b>1.55</b>
<b>TA</b>	<b>3</b>	<b>2.32</b>
<b>PAPVC</b>	<b>2</b>	<b>1.55</b>
<b>TAPVC</b>	<b>2</b>	<b>1.55</b>
<b>Single Ventricle</b>	<b>2</b>	<b>1.55</b>
<b>4. Complex CHD</b>	<b>7</b>	<b>5.42</b>
<b>5. Misce. Condition</b>		
Cor-triartium	1	0.77
Congenital MS	1	0.77
Bicuspid Aortic valve	2	1.55
LCAFA	1	0.77
Dextroposition of heart	3	2.32

Note:Abbreviations as in Tables 2

## DISCUSSION

Congenital heart diseases (CHD) represent one of the major groups of birth defects and make up approximately 1% of human malformations<sup>5-7</sup>. CHD contribute significantly to infant mortality because 10% of infant deaths are due to congenital malformations, and 50% of the latter are cardiovascular malformations<sup>8</sup>. This study does not give a true incidence or prevalence of congenital heart disease in total population because this study was confined to hospital only. In this study more than two-third of CHD were acyanotic.

Maximum number of children with CHD was observed up to 5 years of age same finding was observed in the study done by Al-EHAG<sup>9</sup>. Number of males was 72 and females were 57 with a ratio of 1.26:1. Bassili A et al<sup>10</sup> reported that there was a male predominance in case of pulmonary stenosis and single ventricle, while in case of PDA, mitral valve prolapse, and partial atrioventricular canal defect female predominance. In this study, the female dominance of patent ductus arteriosus and male dominance of ventricular septal defects was observed in acyanotic CHD. In cyanotic CHD the female dominance of TOF and male dominance of TGA was observed

In acyanotic CHD patients, 38(29%) had ventricular septal defect, majority with perimembranous type. 38 patients have isolated ventricular septal defect while 5 children had other cardiac lesions along with ventricular septal defect (VSD). One case had evidence of pulmonary hypertension, who had Eisenmenger with cyanosis. VSD was the commonest CHD in a study performed by Jaiyesimi F et al<sup>11</sup> and Grech-V<sup>12</sup>. Studies by Vashishtha et al<sup>13</sup> and Srivastava et al<sup>14</sup> in India also reported VSD as the

commonest CHD. ASD and PDA was reported as 23% and 11% by Shreshta et al<sup>15</sup>, 7.5% and 22% by Jaiyesimi F et al<sup>11</sup>, 18% and 14% by Chadha SL et al<sup>12</sup> and 11.4% and 4.81% by Samanek M et al<sup>16</sup> while the corresponding figures in our study were 18% and 5.42%.

Among the cyanotic lesions, TOF 11(8.92%) was the commonest congenital heart lesion followed by TGA 4(3.10%). This result is comparable with the studies done by Hag AL<sup>9</sup>, Jaiyesimi F et al<sup>11</sup> Tefuarani N et al<sup>17</sup> and Van der Horst RL<sup>18</sup>. TOF was reported in 13.6% cases by Vashishtha et al<sup>13</sup>; while in our study it was 8.92%. Pulmonary stenosis was found in 3.87% of the cases, which was comparable with the study done in Sudan<sup>9</sup>. Complex cardiac lesion was found in 5.42% in our study, while Jacobs EG reported 3.9% cases of intracardiac mixing<sup>19</sup>. In the latest decades of the 20<sup>th</sup> century, considerable progress has been made in recognizing congenital malformations, including heart defects, with high-resolution fetal echocardiography. Therefore, there was a significant decrease in the number of newborns with CHD. In most cardiac centers, fetal echocardiography is performed in all cases with extracardiac anomalies (20). Furthermore, a proper identification and treatment of CHD early in the prenatal period will protect the family from the economic and emotional burden caused by having such a child with CHD. According to my knowledge, this is the first study carried out in rural hospital for assessing the profile of congenital heart disease children in rural area of Maharashtra state. 2-D echocardiography and Color Doppler examination of all neonates, infants and children suspected of CHD is essential for correct diagnosis and proper management.

## CONCLUSIONS

The children who present with repeated chest infections, respiratory distress, cyanotic appearance, poor feeding and failure to thrive should be specifically examined for congenital heart disease and if required referred for tertiary care to ensure timely treatment by surgical intervention after necessary confirmatory investigations. Our study performed over a period of two years shows that non-cyanotic congenital heart disease is more common than cyanotic heart disease.

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