Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr ICV 2018= 82.06

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Original Research

Clinico-epidemiologic profile of children with congenital heart disease in a tertiary care hospital in North India

Nisha Pandey[1], Vishal Pooniya[2]

[1]Associate Professor, Department of Pediatrics, Era's Lucknow Medical College, Lucknow, U.P., India;
[2]Assistant Professor, Department of Pediatrics, King Georges' Medical University, Lucknow, Lucknow, U.P., India

ABSTRACT:

Background- Congenital heart disease is the most common type of congenital anomaly found in children. Hence this study was conducted to observe the clinic-epidemiologic profile of children suffering from congenital heart disease in pediatric OPD. **Methods**- All children presenting to Pediatrics OPD diagnosed with CHD by clinical findings and echocardiography were included. Their epidemiologic profile and history and examination findings were recorded. **Results**- Total 153 children, with median age 24 months and 70.6% males, were included in the study. They mostly belonged to rural background (82.4%). Most common clinical manifestation was a murmur (89.5%), followed by tachycardia (58.8%) and tachypnea (41.2%). ACHD (76.5%) were more common than CCHD (23.5%). VSD was the most common ACH (39.2%) whereas TOF was most common among CCHD (11.8%). **Conclusions**- Like in other parts of this country, we had a male preponderance in children suffering from CHD. Approximately 3 quarters of all children with CHD had ACHD. The profile of these children was no different from other parts of the country.

Key words: Children, congenital heart disease, India.

Received: 13 March, 2019 Revised: 10 June 2019 Accepted: 12 June 2019

Corresponding Author: Dr Vishal Pooniya, Assistant Professor, Department of Pediatrics, King Georges' Medical University, Chowk, Lucknow-226003, India

This article may be cited as: Pandey N, Pooniya V. Clinico-epidemiologic profile of children with congenital heart disease in a tertiary care hospital in North India. J Adv Med Dent Scie Res 2019;7(8): 92-95.

INTRODUCTION

Congenital heart disease (CHD) is a significant cause of morbidity among children and it constitutes approximately 28% of all congenital defects.[1] In a large study conducted in a community hospital in North India, birth prevalence of significant CHD was found to be 8.07 per 1000 live births.[2] Because of a high birth rate, the load of children suffering from CHD in our country is significant. According to an estimate, more than 180000 children are born with CHD in our country every year.[3] Clinical examination alone is not sufficiently sensitive and specific for diagnosis of CHD, echocardiography along with color Doppler is considered the gold standard for diagnosis of CHD.[4-6] This study was carried out to find out the clinico-epidemiologic profile of children presenting with CHD in the OPD of Pediatrics department of a tertiary care hospital in North India..

MATERIALS AND METHODS

This was a prospective observational study conducted at the Pediatrics OPD of Era's Lucknow Medical College, Lucknow from 01 September 2017 to 31 August 2018. The study was approved by the institute ethics committee. All the children presenting to Pediatrics OPD during the study period with clinical manifestations of CHD and confirmed by echocardiography were included in this study, after obtaining informed consent from the parents/primary caregiver. A detailed history and clinical examination was performed on the study subjects and the findings were recorded in a standard proforma. Underweight, wasting and stunting were defined as weight for age, weight for height and height for age less than median-2SD for age and sex.[7] WHO 2006 growth charts were used for children upto 5 years of age whereas Indian Academy of Pediatrics growth charts 2015 were used for older children.[8, 9] Tachycardia and tachypnea were defined as heart rate and respiratory rate above mean+2SD for age and sex. Statistical analysis was performed using SPSS version 23. Means were compared using students t-test and proportions were compared using Chi-square test, a p-value of <0.05 was considered significant.

RESULTS

A total of 153 children attending the pediatric OPD were confirmed to be suffering from CHD during the study period. Their baseline characteristics are shown in table 1. The median age of our study population was 24 months (range from 2 months to 13 years). Majority of them were boys (70.6%), whereas girls constituted 29.4% of the study population. Most of our study subjects belonged to a rural background [126 (82.4%)].

The proportion of underweight, wasting and stunting in these children was 68%, 46.4% and 68%, respectively. Among the clinical manifestations in children suffering from CHD (table 2), the most common was presence of a murmur, which was found in 137 (89.5%) children. Other manifestations included tachycardia[90 (58.8%)], tachypnea [63 (41.2%)], feeding difficulty [54 (35.3%)], congestive cardiac failure [44 (28.8%)], fever [18 (11.8%)], cyanosis [15 (9.8%)], recurrent chest infections [15 (9.8%)] and clubbing [9 (5.9%)]. Extracardiac anomalies/manifestations were seen in 13 (8.5%) children, all of them had an acyanotic congenital heart disease (ACHD). These included 3 children with trisomy 21, one of whom had complete atrioventricular septal defect and 2 had a perimembranous ventricular septal defect (VSD), 2 children with congenital rubella and patent ductusarteriosus (PDA). Others were 2 with cleft lip and palate (1 with VSD and the other with aortic coarctation), 1 child with scoliosis (with VSD), 1 with alkaptonuria (with severe valvular PS), 1 with polydactyly (with VSD), 1 with syndactyly (with peripheral pulmonary stenosis), 1 with nephrotic syndrome (with VSD) and 1 with hypothyroidism [with tetralogy of Falot (TOF)].

Table-3 depicts the frequency of various CHDs in the study population. ACHD were more common [117 (76.5%)] than cyanotic ones [36 (23.5%)]. Among the ACHD, VSD was most common, found in 60 (39.2%) children followed by atrial septal defect [18 (11.8)] and PDA [15 (9.8)], whereas the remaining 24 (15.7%) children had other miscellaneous ACHDs. TOF was the most common cyanotic congenital heart disease (CCHD), found in 18 (11.8%) children, followed by transposition of great arteries [9 (5.9)], double outlet right ventricle [3 (2.0)] and miscellaneous disorders [6 (3.9)]. On comparing the clinic-epidemiologic profile of children with ACHD with CCHD (table-4), it was found that significantly more number of children with ACHD came from a rural background[102 (87.2%) vs 24 (66.7%), p value = 0.021]. A history of recurrent chest infections [15 (12.8%)] and extracardiac anomalies [24 (20.5%)] were seen exclusively in children suffering from ACHD whereas clubbing [9 (25.0%)] was seen exclusively among children with CCHD. Significantly more number of children with ACHD had tachypnea [57 (48.7%) vs 6 (16.7%), p value = 0.008], tachycardia [84 (71.8%) vs 6 (16.7%), p value = 0.000], feeding difficulties [48 (41.0%) vs 6 (16.7%), p value = 0.029] and congestive heart failure (CHF) [42 (35.9%) vs 2 (5.6%), p value = 0.001] as compared to CCHD. Sex ratio, presence of fever at presentation [15 (12.8%) vs 3 (8.3%), p value = 0.727] and proportion of underweight [82 (70.1%) vs 22 (61.1%) p value = 0.568], wasting [53 (45.3%) vs 18 (50.0%), p value = 0.109] and stunting [71 (61.5%) vs 22 (61.1%), p value = 0.508] were comparable between these two groups of children.

Table 1 – Baseline characteristics of children with congenital heart disease.

Variable	N (%)
Age (months)	24 (2-156)*
Sex	
Males	108 (70.6)
Females	45 (29.4)
Residence	
Urban	27 (17.6)
Rural	126 (82.4)

* median (range)

Table 2 – Clinical manifestations of children with congenital heart disease.

Clinical Manifestation	N (%)
Nutritional status	
Underweight	104 (68.0)
Wasted	71 (46.4)
Stunted	93 (60.8)
Murmur	137 (89.5)
Fever	18 (11.8)
Tachycardia	90 (58.8)
Tachypnea	63 (41.2)
Cyanosis	15 (9.8)
Clubbing	9 (5.9)
CHF	44 (28.8)
Feeding difficulty	54 (35.3)
Recurrent chest infections	15 (9.8)
Extracardiac anomalies*	24 (15.7)

* Trisomy 21– 3, congenital rubella- 2, cleft lip and palate- 2, scoliosis- 1, alkaptonuria- 1, syndactyly- 1, polydactyly- 1, nephrotic syndrome- 1, hypothyroidism- 1.

Table 3: Diagnosis of children with Congenital Heart Disease

Diagnosis	n (%)
Acyanotic Congenital Heart Disease	117 (76.5)
VSD	60 (39.2)
ASD	18 (11.8)
PDA	15 (9.8)
Miscellaneous	24 (15.7)
Cyanotic Congenital Heart Disease	36 (23.5)
TOF	18 (11.8)
TGA	9 (5.9)
DORV	3 (2.0)
Miscellaneous	6 (3.9)

ASD- atrial septal defect, DORV- double outlet right ventricle, PDA- patent ductusarteriosus, TGA- transposition of great arteries, TOF- tetralogy of Falot, VSD- ventricular septal defect.

Table 4: Comparison of children with Acyanotic Congenital Heart Disease and Cyanotic Congenital Heart Disease

Variable	ACHD (n=117)	CCHD (n=36)	P value
Sex			
Male	78 (66.7)	30 (83.3)	0.117
Female	39 (33.3)	6 (16.7)	
Residence			
Urban	15 (12.8)	12 (33.3)	0.021
Rural	102 (87.2)	24 (66.7)	
Nutritional Status			
Underweight	82 (70.1)	22 (61.1)	0.568
Wasted	53 (45.3)	18 (50.0)	0.109
Stunted	71 (61.5)	22 (61.1)	0.508
Tachycardia	84 (71.8)	6 (16.7)	0.000
Tachypnea	57 (48.7)	6 (16.7)	0.008
Feeding difficulty	48 (41.0)	6 (16.7)	0.029
CHF	42 (35.9)	2 (5.6)	0.001
Fever	15 (12.8)	3 (8.3)	0.727
Recurrent pneumonia	15 (12.8)	0 (0)	0.112
Clubbing	0 (0)	9 (25)	0.000
Extracardiac anomalies	24 (20.5)	0 (0)	0.011

ACHD- acyanotic congenital heart disease, CCHD- cyanotic congenital heart disease, CHF- congestive heart failure

DISCUSSION

Most of the children with CHD were males (70.6%) in our study. Other hospital based studies from India have also reported a male preponderance in children with CHD, ranging from 52.4% to 66.7%.[10-14] Majority of our patients came from a rural background (82.4%), this finding was in contrast with another hospital based study performed by Meshram et al, where 60.93% children with CHD came from an urban background.[12] This may be because most of the clientele in our institute is from the underprivileged rural population. A high proportion of our study population was underweight, wasted and stunted, amounting to 68%, 46.4% and 60.8%, respectively. Karthiga et al also studied children below 14yrs of age in hospital setting suffering from CHD and they also found a high proportion of them to be underweight (80% in ACHD and 77.7% in CCHD) and wasted (43.8% in ACHD and 64% in CCHD).[11]

The common clinical manifestations of CHD reported are murmur, tachypnea/breathlessness, tachycardia, fever and CHF.[10-12] We also had similar findings, with murmur, tachycardia, tachypnea, feeding difficulty and CHF being the common clinical manifestations, in that order. Karthiga et al reported that 6.06% children with CHD had cleft lip and palate and 3.03% had Down syndrome as extracardiac manifestations.[11] We found that extracardiac manifestations/anomalies were found in 13 (8.5%) of children with CHD and all of them had ACHD.

In accordance with other studies and available literature, our study also showed that ACHD constituted approximately 3/4ths and CCHD remaining 1/4ths of the CHD in children. VSD was the most common ACHD in our study followed by atrial septal defect and PDA, whereas in CCHD, TOF was the most common followed by transposition of great arteries and double outlet right ventricle. Similar findings have been demonstrated by various other studies also.[10-14] We also compared ACHD with CCHD and found that tachypnea, tachycardia, CHF and feeding difficulties were significantly more common in ACHD. This is explained by the fact that majority of ACHD were left to right shunts with increased pulmonary blood flow leading to tachypnea, tachycardia, CHF and feeding difficulties whereas the most common ACHD was TOF which lacked such features. We were unable to find such comparison in other studies from India.

CONCLUSION

CHD is the most common congenital defect found in children and is a significant cause of morbidity in children. The clinico-epidemiologic profile in this region

of our country is comparable to other parts of India. Majority of CHD in children are acyanotic with VSD being the most common type.

REFERENCES

1. Dolk H, Loane M, EUROCAT Steering Committee. Congenital Heart Defect in Europe: 2000-2005. Newtownabbey, Northern Ireland: University of Ulster; March 2009. Available from: *http://eurocat.bio-medical.co.uk/content/Special-Report.pdf*. Accessed May 18, 2017.
2. Saxena A, Mehta A, Sharma M, Salhan S, Kalaivani M, Ramakrishnan S, *et al*. Birth prevalence of congenital heart disease: A cross-sectional observational study from North India. Ann Pediatr Card 2016;9:205-9.
3. Saxena A. Congenital heart disease in India: A status report. Indian J Pediatr2005;72:595-8.
4. Meberg A, Otterstad JE, Froland G, Hals J, Sörland SJ. Early clinical screening of neonates for congenital heart disease: The cases we miss. Cardiol Young 1999;9:169-74.
5. Sands A, Craig B, Mulholland C, Patterson C, Dornan J, Casey F. Echocardiographic screening for congenital heart disease: A randomized study. J Perinat Med 2002;30:307-12.
6. Skinner JR. Echocardiography in the neonatal unit: A job for the neonatologist or cardiologist. Arch Dis Child 1998;78:401-2.
7. Ashworth A. Nutrition, food security and health. In: Kliegman RM, Stanton BF, Geme JWS, Schor NF (eds). Nelson textbook of pediatrics 1st South Asia edition. New Delhi: Reed Elsevier India Pvt Ltd;2016:295-306.
8. WHO. Child growth standards. ActaPediatrSuppl2006;450:5-101.
9. Khadilkar VV, Khadilkar AV. Revised Indian Academy of Pediatrics 2015 growth charts for height, weight and body mass index for 5-18 years old Indian children. Indian J EndocrMetab2015;19:470-6.
10. Mahapatra A, Sarangi R, Mahapatra PP. Spectrum of congenital heart disease in a tertiary care centre of Eastern India. Int J ContempPediatr 2017;4:314-6.
11. Karthiga S, Pathak S, Lazarus M. Clinical and Anthropometric Profile of Congenital Heart Disease in Children Admitted in Pediatric Ward. Int J Sci Stud 2017;5(5):112-117.
12. Meshram RM, Gajimwar VS. Prevalence, profile, and pattern of congenital heart disease in Central India: A prospective, observational study. Nig J Cardiol2018;15:45-9.
13. Wanni KA, Shahzad N, Ashraf M, Ahmed K, Jan M, Rasool S. Prevalence and spectrum of congenital heart diseases in children. Heart India 2014;2:76-9.
14. Vyas PM, Oswal NK, Patel IV. Burden of congenital heart diseases in a tertiary cardiac care institute in Western India: Need for a national registry. Heart India 2018;6:45-50.