International Journal of Contemporary Pediatrics
Chaudhary A et al. Int J Contemp Pediatr. 2023 Dec;10(12):1837-1840
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: https://dx.doi.org/10.18203/2349-3291.ijcp20233606

Original Research Article

Spectrum of congenital heart diseases in children (<5 years) in a tertiary care centre

Aneeta Chaudhary[1]*, Arun Kumar Arya[1], Tanu Midha[2]

[1]Department of Pediatrics, GSVM Medical College, Kanpur, Uttar Pradesh, India
[2]Department of Preventive and Social Medicine, GSVM Medical College, Kanpur, Uttar Pradesh, India

Received: 25 October 2023
Revised: 14 November 2023
Accepted: 18 November 2023

***Correspondence:**
Dr. Aneeta Chaudhary,
E-mail: aneeta75.aa@gmail.com

ABSTRACT

Background: Congenital heart diseases are a major cause of mortality and morbidity in children. The aim of the study was to know the spectrum of congenital heart diseases in a tertiary care centre.
Methods: This was a prospective, hospital based observational study done in Lala Lajpat Rai Hospital, Kanpur. Duration of study was 12 months. Patients with strong clinical suspicion of cardiac disease were enrolled and detailed clinical examination and laboratory findings of these cases were noted in a pre-structured proforma. The confirmation of presence of congenital heart disease was done by echocardiography.
Results: 150 patients aged below 5 years presenting with signs and symptoms suggestive of CHD were evaluated in this study. 91 were found to have congenital heart disease. We found VSD in 31.87%, ASD in 29.98%, PDA in 9.9% TOF in 5.49% and complex heart diseases in 16.48% cases. When considering the age at presentation, we found maximum number of cases (46.15%) in 1 to 12 months of age, 37.37% cases in neonatal period, 16.48% cases in 1 to 5 years of age. Most common presenting complaint was difficulty in breathing, followed by feeding difficulty.
Conclusions: Ventricular septal defect 31.87% was the commonest heart disease, followed by ASD 29.98%. The majority of these patients were seen in the age group 1 to 12 months of age.

Keywords: Congenital heart disease, Tertiary care centre, Kanpur

INTRODUCTION

Congenital heart defects are the most common type of congenital anomaly, which constitutes an important group of pediatric illness and major cause of childhood mortality and morbidity.[1] Congenital malformations of the heart and circulation are not fixed anatomic defects that appear at birth but instead are anomalies in flux that originate in the early embryo, evolve during gestation, survive the dramatic circulatory alterations at birth, and change considerably during extra uterine life.[2]

The objective of study was to study age and gender wise distribution, clinical profile and spectrum of congenital heart diseases in children (<5 years) in a tertiary care centre.

METHODS

Study type

The study was a prospective hospital based observational study.

Study place

The study was conducted in Lala Lajpat Rai Hospital, Kanpur.

Period

The study was done from November 2021 to October 2022.

Selection criteria of patients

Inclusion criteria

All children <5 years with clinically suspected congenital heart disease were included.

Exclusion criteria

Patients with previously diagnosed heart diseases were excluded.

Procedure

In a period of 12 months, any patient <5 years with strong clinical suspicion of congenital heart disease attending inpatient and outpatient department of Lala Lajpat Rai Hospital (including children's emergency and SNCU) was selected for study.

CHD was suspected based on the clinical features and an abnormal pulse oximetry value (<90%). A detailed history of patients was taken from their reliable informant with special emphasis on complaints suggestive of any cardiac illness. Developmental milestones and anthroprometry was also assessed, general and systemic examination of patients was done and patients were also screened for presence of any other anomaly. All this was done using a pre-structured proforma. These patients were screened using NADAS criteria and were further classified into NADAS positive and negative. The confirmation of presence congenital heart disease was done using echocardiography. All those patients who were not found to have congenital heart disease on echocardiography were excluded.

Ethical approval

Ethical approval was taken from Institutional Ethics Committee (for biomedical health and research), GSVM Medical College, Kanpur.

Statistical analysis

Total 150 patients were studied, but only 91 were found to have congenital heart disease on echocardiography. So, we compiled the data of these patients. For age and sex distribution, we further divided the patients into 0 to 1 month, 1 to 12 months and >1 year to 5 years age group. Quantitative variables in each group were analyzed using mean. For clinical profile of patients, we again calculated mean of each complaint and for spectrum, mean of number of patients of each heart disease was calculated.

Sampling technique

This was an observational study and aim was to include all patients with clinically suspected heart disease in age group 0 to 5 years presenting in duration of study (1 year) in our hospital. 150 patients were studied, but only 91 patients were found to have congenital heart disease. Most of the patients presenting to us were a follow up of previously diagnosed cases which came under our exclusion criteria.

RESULTS

We studied 150 patients in age group 0 to 5 years with clinical suspicion of CHD, 91 cases were confirmed to have congenital heart disease, out of which 56 were male and 35 were female and male to female ratio was 1.6:1.

Table 1: Age and sex distribution of congenital heart diseases.

Age	Male		Female		Total	
	No.	%	No.	%	No.	%
0 to 1 month	18	32.14	16	45.71	34	37.37
1 to 12 months	30	53.57	12	34.29	42	46.15
1 to 5 years	08	14.28	07	20	15	16.48
Total	56		35		91	

Table 2: Clinical profile of patients presenting with congenital heart diseases.

Symptoms	N (%)
Bluish discoloration of body	22 (24.17)
Recurrent respiratory infections	22 (24.17)
Palpitations/chest pulsations	10 (10.99)
Swelling of face and limbs	2 (2.2)
Forehead sweating	22 (24.17)
Impaired consciousness/unresponsiveness	6 (6.59)
Suck rest suck cycle/feeding difficulty	26 (28.57)
Difficulty in breathing	87 (95.6)
Any other symptom	11 (12.08)

Table 3: Spectrum of congenital heart diseases in age group 0 to 5 years.

S. No.	Echo status	Male	Female	Total	
				No.	%
1.	VSD	21	08	29	31.87
2.	ASD	10	10	20	29.98
3.	PDA	04	05	09	9.9
4.	TOF	04	01	05	5.49
5.	Complex (others)	09	06	15	16.48
6.	TAPVC	02	00	02	2.2
7.	AV canal defect	01	01	02	2.2
8.	Single ventricle	01	00	01	1.1
9.	HOCM	01	00	01	1.1
10.	TGA	02	00	02	2.2
11.	Pentalogy of fallot	00	01	01	1.1
12.	Tricuspid atresia	01	02	03	3.3
13.	Hypoplastic left heart syndrome	00	01	01	1.1

Table 4: Comparison of prevalence of congenital heart disease of our study with various other studies.

Our study (%)	Samanek et al (1989) (%)	Khalil et al (1993) (%)	Kapoor et al (2007) (%)	Bhardwaj et al (2014) (%)	Bibi et al (2018) (%)
VSD (31.87)	VSD (31.41)	PDA (41.9)	VSD (21.3)	VSD (33)	VSD (38.2)
ASD (29.98)	ASD (11.37)	VSD (34.9)	ASD (18.9)	ASD (19)	ASD (7.9)
Complex (16.48)	AS (7.64)		PDA (14.6)	TOF (16)	Complex (9)
PDA (9.9)	PS (7.13)		TOF (4.6)		TOF (5.6)
TOF (5.49)	CoA (5.77)				

Table 1 shows that most of the cases were in the age group of 1 to 12 months (46.15%) followed by less than 1 month (37.37%) and 16.48% of cases were in the age group of 1 to 5 years.

As depicted in Table 2, difficulty in breathing emerged as the most common presenting complaint, followed by feeding difficulty. Total 12.08% cases presented with complaints which were not suggestive of any cardiac illness.

As mentioned in Table 3, cases with VSD were found to be 31.87%, ASD were 29.98%, PDA were 9.9%, TOF were 5.49%, 16.48% cases were combination of multiple defects.

DISCUSSION

150 patients aged below 5 years presenting with signs and symptoms suggestive of CHD were evaluated in this study. Our study showed a male preponderance. When symptoms were taken into consideration we found difficulty in breathing as most common presenting complaint, followed by feeding difficulty. Among congenital heart diseases we found VSD in 31.87%, ASD in 29.98%, PDA in 9.9% TOF in 5.49% and complex heart diseases in 16.48% cases. VSD was the most common acyanotic CHD while TOF was the most common cyanotic CHD. This correlated with study done by Doshi et al (2022) which included children between the age group of 0-18 years.[3] VSD was the most common acyanotic CHD with 41.1% cases while TOF was the most common cyanotic CHD with 67% cases. The most usual presenting symptoms in children with CHDs were breathlessness with 70% cases. This also correlated with our study.

A study done by Kapoor et al gives prevalence of 26.4/1000 patients.[4] VSD was the commonest lesion (21.3%), followed by ASD (18.9%) and PDA (14.6%). Tetralogy of Fallot was the commonest cyanotic heart disease (4.6%), which correlates with our study.

The prevalence in our study was also similar to the study done by Bibi et al (2018) which showed a male preponderance with 57 (64%) male patients as compared to 32 (36%) female patients.[5] Ventricular septal defect (VSD) was the commonest cardiac lesion being present in 34 (38.2%) patients.

The prevalence also correlates with the study done by Bhardwaj et al (2014) and Samanek et al (1989) with both having VSD as the commonest congenital heart disease followed by ASD.[6,7]

When considering the age at presentation, we found maximum number of cases (46.15%) were seen in 1 to 12 months of age, 37.37% cases in neonatal period, 16.48%

cases in 1 to 5 years of age. Total number of 91 cases were found to have CHD out of which 56 cases were male and 35 were female, and male to female ratio was 1.6:1.

Male to female ratio was 1.6:1 which also correlated with study done by Bibi et al (2018) and Doshi et al (2022) with ratio 1.78:1 and 1.7:1 respectively.[3,5]

The study done by Khalil et al gives the incidence of CHD per 1000 live births.[8] They studied 10964 live births and observed the incidence of 3.9/1000 live births. Patent ductus srteriosus (41.9%) and ventricular septal defects (VSD) (34.9%), were the commonest lesions with the incidence of 1.6 and 1.4/1000 live births, respectively.

Compared to Khalil et al we couldn't follow the patient for 6 to 18 months, but unlike the study by Kapoor et al which was based on a super-speciality corporate hospital, our study included patients from all sect of the society including below poverty line. Thus, more suggestive of the spectrum and true burden of the disease.

Limitations of the study

The limitations of the study were smaller sample size and follow up of the patients was not done.

CONCLUSION

We concluded that VSD 31.87% was the commonest heart disease, followed by ASD 29.98%, congenital heart diseases showed male preponderance with male to female ratio of 1.6:1. VSD was the commonest acyanotic heart disease and TOF was the commonest cyanotic heart disease. The majority of patients were seen in the age group 1 to 12 months of age (46.15%). Difficulty in breathing was the most common presenting complaint followed by feeding difficulty.

Recommendations

In a place like ours where patients come from all strata of the society including below poverty line, with high mortality even without knowing the cause of it due to less awareness, facility and affordability for echocardiography, knowing the true spectrum of the disease will help in early recognition, prompt and appropriate management of the patient. This will reduce both mortality and morbidity in children with congenital heart diseases.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Bhardwaj R, Rai SK, Yadav AK, Lakhotia S, Agrawal D, Kumar A, et al. Epidemiology congenital heart disease in India. Congent Heart Dis. 2015;10(5):437-46.
2. Sommer RJ, Hijazi ZM, Rhodes JF. Pathophysiology of congenital heart disease in the adult: part I: shunt lesions. Circulat. 2008;117(8):1.
3. Doshi M, Jain H, Saini A. Clinical and anthropological profile of children presenting with features of congenital heart disease at tertiary care centre. Int J Contemp Pediatr. 2022;9:614.
4. Kapoor R, Gupta S. Prevalence of congenital heart disease, Kanpur, India. Indian Pediatr. 2008;45(4):309-11.
5. Bibi S, Gilani SY, Bibi S. spectrum of congenital heart disease in full term neonates. J Ayub Med Coll Abbottabad. 2018;30(1):67-70.
6. Bhardwaj R, Rai SK, Yadav AK. Epidemiology of congenital heart disease in India. Congenit Heart Dis. 2015;10(5):437-46.
7. Samánek M, Slavík Z, Zborilová B, Hrobonová V, Voríšková M, Skovránek J. Prevalence, treatment, and outcome of heart disease in live-born children: a prospective analysis of 91,823 live-born children. Pediatr Cardiol. 1989;10(4):205-11.
8. Khalil A, Aggarwal R, Thirupuram S, Arora R. Incidence of congenital heart disease among hospital live births in India. Indian Pediatr. 1994;31(5):519-27.

Cite this article as: Chaudhary A, Arya AK, Midha T. Spectrum of congenital heart diseases in children (<5 years) in a tertiary care centre. Int J Contemp Pediatr 2023;10:1837-40.