J. Cardiovasc Disease Res., 2020; 11(2): 232 – 236
A Multifaceted Peer Reviewed Journal in the field of Cardiology
www.jcdronline.org | www.journalonweb.com/jcdr
P – ISSN: 0975 – 3583 Online: 0976 – 2833

Pattern and Clinical Profile of Congenital Heart Disease (CHD) in Infancy and Childhood

Kshirsagar VY[1], Mohite RV[2], Erram M[3]
[1]*Professors, Dept of Paediatrics, Krishna Institute of Medical Sciences "Deemed to be University" Karad, India.*
[2]*Assist Professors, Dept of Community Medicine, Krishna Institute of Medical Sciences "Deemed to be University" Karad, India.*
[3]*Resident, Dept of Paediatrics, Krishna Institute of Medical Sciences "Deemed to be University" Karad, India.*
Corresponding author: Dr. Rajsinh Mohite, MD (Comm Med),
Lecturer, Krishna Institute of Medical Sciences "Deemed to be University" Karad, India.
Email: rajsinhmohite124@gmail.com

ABSTRACT

Background: A congenital cardiac defect contributes to public health threats across the globe among neonates and under-fives with additional burden on the family as well as society.

Objectives: To assess clinical profile, complications, and outcome of patients suffering from congenital heart diseases at a rural tertiary health care center.

Methodology: A hospital-based cross-sectional, forward-moving scientific research project was carried out at the child clinic of Krishna Hospital and Medical Research Centre Karad over a period of 20 months. A total of 57 children were enrolled in the research project by employing inclusion criteria and interviewed, examined as per the pre-tested structured questionnaire. Ethical practices were strictly followed to maintain the dignity and management protocol of each study participant. The descriptive and inferential statistical procedures were performed to determine the correlation between study variables.

Results: The total of 57 cases of congenital heart diseases was examined of which ventricular septal defects identified as commonest form with 42.6%. The gender distribution showed apparent differences, 1.3:1 with congenital heart disease presentation. The classical clinical presentation noticed was tachypnoea among 60% cases followed by weakness in 54.8%. Failure to thrive was a common physical growth failure parameter recorded in children with congenital heart disease problems. Abnormal heart sounds and cardio-myopathy also encountered as a classical cardiac outcome in patients with congenital heart disease. The adverse events like failure to thrive, pulmonary hypertension, and heart failure came across the cases.

Conclusion: Congenital heart diseases reflected as a global paediatric concern in different sectors of the community on the alarming side.

Keywords: Congenital heart disease, infancy, childhood, clinical profile, treatment outcome

Correspondence:
Rajsinh Mohite
Lecturer, Krishna Institute of Medical Sciences "Deemed to be University" Karad, India
E-mail Address:
rajsinhmohite124@gmail.com

Submitted: 30-04-2020
Revision: 30-05-2020
Accepted Date: 30-06-2020

DOI: 10.31838/jcdr.2020.11.02.39

INTRODUCTION

Congenital heart diseases (CHDs) are on the alarming side among neonates and under-fives lead to major health concerns in paediatric population across the worldwide[1]. CHDs are nothing but anatomical defects in the circulatory system include cardiac or main blood vessels that perform major role in functioning of human body [2].

A new case detection rate of CHDs was reported around 8 per 1000 live births in the 1980-90s, with an alarming rate of newborns with stillbirth, abortion, and prematurity [3,4]. In current the scenario, inspite of the use of modern medical interventions, the problem statement of CHDs remained the same at global level [5]. A population survey was carried out in South East Asian region, identified the problem statement of CHDs around 0.18% [6]. World Health Organization in its periodicals also mentioned the incidence of CHDs was much higher in India, 15% followed by 10% in Srilanka however, around 6% in Bangladesh and Burma respectively.[7] The differences in the magnitude of the congenital lesions may vary with geographical distribution but CHDs are common, 80% among all worldwide [8].

The proportions of various abnormalities identified under CHD ranges from 4% to 36 % of which lower and higher proportions were reported in Tetralogy of Fallot (TOF) and defects in the septum of ventricles respectively [8]. The gender presentation of CHD addresses similar proportions at most of the defects however, the apparently higher proportion was noticed among males with defects such as Aortic Stenosis (AS), Coarctation of the aorta (COA), transposition of great vessels, and Tetralogy of Fallot (TOF). The most probable cause of CHD is still not known however, maximum patients of birth defects with cardiac in origin are multi-factorial as per research which might be resulted due to integration of molecular Characterization and environmental manipulations [9].

The sign and symptoms of birth defects belonged to cardiac in nature vary from patient to patient and determined by the natural history of diseases and pathology [10]. In the neonatal period, bluish discoloration of the skin (peripheral/central), poor APGAR score are the most important clinical diagnostic parameters. The usual clinical presentation of CHDs in children is central cyanosis, clubbing, cardiac murmur, syncope attacks, squatting position, congestive heart failure, cardiac arrhythmia, and failure to thrive etc [11]. Most of the young and late adult cases visited with sudden cardiac fail, abnormal heart sounds, increased heart rate, bluish discoloration of lips and tongue, rise in blood pressure, and stroke etc.

As a result of birth defects with cardiac in origin, the survival of infant or child depends upon severity of pathological condition. Apart from growth and development of child, family contribution including care

and financial provision adversely affects the economic status lead to poverty. As per Indian public health concern, yet there is no any strategic provision for early diagnosis of birth defects as well as early neonatal management. Advancement in modern diagnostics and killed health resources significantly improves infant and under-five mortality rate in India [12]. The proposed research project insight the current epidemiological and therapeutic situation of CHD among the children admitted at the rural tertiary health care centre and findings will be incorporated for the better understanding of magnitude and outcome of clinical condition to develop the preventive strategies for policymakers as well as up-gradation of existing public health care institutions for early detection and prompt management resulted in decline the infant and child mortality at the national level.

MATERIAL AND METHODS

The proposed research project carried out in Paediatric clinical set up at a rural tertiary health care center, India. The project work was taken 20 months for its completion and report submitted by February 2020. A total of 57 eligible cases suffering from CHD as per inclusion criteria were assigned by practicing purposive sampling technique. The epidemiological approach was descriptive in nature with prospective enrollememt of participants. A self-designed, modified, and pre-tested questionnaire used to elicit information from each patient addresses the variables pertained to disease under research. All patients suspected underwent a thorough clinical examination after a detailed history, interview, and was followed by investigative workup was as per the proforma. The criteria to suspect CHD was followed as formulated by Alexander NADA;

Major criteria

(i) Systolic murmur III or more especially with thrill (ii) Diastolic murmur (iii) Cyanosis (iv) Congestive Cardiac Failure (CCF)

Minor criteria

(i) Systolic murmur less than III (ii) Abnormal S2 (iii) Abnormal ECG (iv) Abnormal X-ray (v) Abnormal BP

Inclusion criteria

Children from new born to 12yrs of age suspected of CHD on OPD basis and admitted to Paediatric ward KH and MRC Karad.

Investigations

Routine investigations like Hb%, TLC. Specific investigation like – Chest X-ray, ECG, Echocardiography. Sample of 57 cases attending KIMS Hospital during the study period were selected. After inclusion in the study in each case a thorough history was taken followed by a detailed examination and the observations were recorded in a prescribed revalidated proforma. The data so collected were entered into MS-Excell as per variables under investigations after coding and decoding and analysed by using In-Stat statistical software for association.

RESULTS

Amongst the total 57 CHD cases, maximum 42.6% of were belonged VSD in nature followed by 18.3% by TOF however, proportion of others defects was low [Table 1]. The gender distribution ratio noticed 1.3:1 indicating male predominance in context to VSD, TOF, A-V canal defect however, ASD, PDA, COA, TGA belonged to females respectively [Fig 1]. Max, 60% cases had difficulty in breathing followed by general weakness in 54.8%. The chest infection was observed in 34.8% cases, failure to thrive in 41.7% whereas anaemia among 18.3% cases and rest of the presentation mentioned in text [Table 2 and 3]. Abnormal cardiac sounds and enlarged heart were the commonest and crucial cardiac finding observed in the study [Table 4]. The percentages of adverse effects encountered in cases recorded maximum as growth failure followed by cardiac failure [Table 5].

Table 1: Distribution of CHD classification (N-57)

Type of CHD	Frequency	Percentage
VSD	25	42.6%
TOF	10	18.3%
ASD	8	14.8%
PDA	5	7.8%
A-V Canal defect	1	3.5%
COA	2	1.7%
TGA	1	1.7%
A-V canal, single ventricle	2	0.9%
Multiple lesions	3	0.9%

Table 2: Distribution of clinical presentation of CHDs (N=57)

Symptoms	No. of cases	Percentage
Difficulty in breathing	25	60%
Weakness	08	54.8%
Cough	10	43.5%
Failure to thrive	5	41.7%
Respiratory infection	1	34.8%
Temperature	2	28.7%
Feeding problems	1	26.1%

Tachycardia	2	21.7%
Cyanosis	3	13%
GTCC	1	1.7%

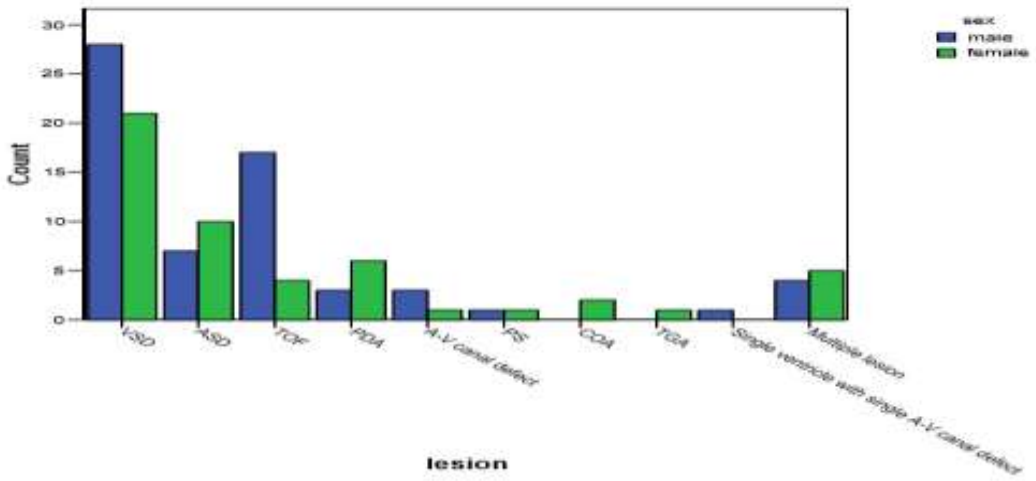

Fig 1: Gender wise distribution of CHDs (N-57)

Table 3: Classical clinical observations in CHD cases (N=57)

Clinical finding	Frequency of cases	%
Dyspnoea	26	46.1%
Tachypnoea	25	43.5%
Increased pulse rate	22	37.4%
Air hunger	19	33%
Crepitations	14	25.2%
Cyanosis	12	22%
Polycythaemia	11	19.1%
Enlarged tender liver	10	17.3%
Anaemia	11	18.3%
Enlargement of terminal phalanges	10	17.4%
Ronchi	08	13%
Oedema	06	10.4%
Prominent cervical veins	04	07%
Rise in blood pressure	01	1.7%
Radio femoral delay	01	1.7%

Table 4: Classical cardiac observations in disease under study (N=57)

CHDs	Cardiomegaly	Thrill	Palpable P_2	Parasternal heave	Fixed splitting S_2	Single S_2
VSD	39(79.6%)	45(91.8%)	7(14.3%)	8(16.3%)	0(0.0%)	0(0.0%)
ASD	1(5.9%)	0(0.0%)	3(17.6%)	3(17.6%)	17(100%)	0(0.0%)
TOF	3(14.3%)	7(33.3%)	0(0.0%)	0(0.0%)	0(0.0%)	14(66.7%)
PDA	4(44.4%)	9(100%)	2(22.2%)	2(22.2%)	0(0.0%)	0(0.0%)
PS	1(50%)	2(100%)	1(50%)	1(50%)	0(0.0%)	2(100%)
COA	2(100%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)
AV flow obstacles	2(50%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)
TGA	1(100%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)
Single ventricle	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)
Other conditions	7(77.8%)	6(66.7%)	1(11.1%)	1(11.1%)	1(11.1%)	0(0.0%)

Table 5: Presentation of adverse events across disease under study (N=57)

Adverse events	VSD(N=25)	ASD(N=8)	TOF(N=10)	PDA(N=5)	Others(N=9)
Cardiac failure	15(30.6%)	0(0.0%)	1(4.8%)	1(11.1%)	4(21.1%)
Pulmonary hypertension	7(14.2%)	3(17.6%)	0(0.0%)	4(44.4%)	1(5.2%)
Failure to thrive	21(42.8%)	5(29.4%)	17(80.9%)	3(33.3%)	2(10.5%)
Respiratory infections	22(44.9%)	7(41.1%)	1(4.8%)	5(55.5%)	2(10.5%)
Pyogenic brain lesions	0(0.0%)	0(0.0%)	1(4.8%)	0(0.0%)	0(0.0%)

DISCUSSION

Present study, depicts the defect in the septum of cardiac ventricle as a leading type of CHD among patients admitted from rural habitats. This correlates with many studies[13,14] but this differs from studies carried out in some of the countries under South East Asian region [15,16,17]. The authors from Bangladesh[15, 16] found ASD the commonest lesion and disagreement in results could be enrollememt of adult population as study participants. A majority of VSDs going to close spontaneously as child enter into adulthood period however; unmanaged cases with big defect in ventricular septal wall may at high risk of mortality. In context to ASDs, most of the patients may remain asymptomatic during their childhood period however; they may accidentally diagnose in adult age group. The research output from a city Dhaka reported many of the new borns had minute defects in ventricular septum however; children with TOF fail to showed clinical presentations[17]. The majority of scientific literature across the globe agreed that TOF is leading type of cyanotic developmental cardiac problem[13,14,15,16,17] and similarity was also noticed with current research.

The current research revealed 1.3:1 as gender representation with CHD. The dominant proportions of VSD, TOF, A-V canal defect and single ventricle noticed in the male participants. The quantification of ASD, PDA, COA, and TGA mainly shared by female study subjects whereas common presentation seen in PS type of CHDs. The similar findings have been also apparently agreed in the review of literature searched from South East Asian countries[14,18]. Amongst the clinical case presentations, breathlessness, cough, fatigue, poor weight gain, feeding problems, palpitation, cyanosis, clubbing edema were the major entities noted and were associated well with studies carried out in , India [19,20] and western countries too[21,22].

The current research observed maximum cases of CHD with defects in the Atrial septal wall but remained without any clinical presentation. They were admitted in the hospital for some other disease condition and accidentally detected as ASDs on clinical examinations. A massive literature review reported that minute sized defect in the Atrial septal wall could be remained without any clinical presentation during entire life and may closes on its own in later life of years.[11] Clinical cardiology revealed murmur in the presence or absence of thrill and of significant cardiomegaly in most of the cases. Cardiomegaly was also found commonly cases with defect in the ventricular septum too and observations have been consistent were also noted in a study carried out in the USA[23]. The current study observed pan systolic murmur in almost all, 100% cases of VSD, and similar findings have been also made by researchers from the USA and India[24]. An ejection systolic murmur was present in all (100%) cases of TOF; and results were also consistent with the findings of Naik et al[25] and also 88.2% of the apparent similarity with the review of literature from Bangladesh [16]. Uninterrupted abnormal heart sounds were identified in each and every case (100.0%) from the current research often related with Patient Ductus Arterosis (PDA) and strongly consider with the findings reported in a review of literature from the Bangladesh[16].

CONCLUSION

Congenital heart diseases are a major problem in India and now alarming in rural areas too. The ventricular septal defect shares the major portion of CHDs with significantly higher percentages among males. However, some of the CHDs are asymptomatic and identified late so required for careful evaluation of the newborn.

RECOMMENDATIONS

1) Emphasis on strengthening and utilization of ANC services with expanded packages on the prevention of birth defects.

2) Strengthening of neonatal and under-five services for early diagnosis and comprehensive management of congenital defects.

CONFLICT OF INTEREST

None

REFERENCES

1. Schoen FJ, Cortan RS, Kumar V, Robins SL. The Heart. 6th ed. Robins Pathologic Basis of Disease. Philadelphia: W.B. Saunders Company, 1999; 543-600.
2. Mitchell SC, Korones SB, Berendes H.W. Congenital heart disease in 56,109 births. Incidence and natural history. Circulation 43 (1971), pp. 323–332.
3. Fyler DC, Buckley LP, Hellenbrand WE, Cohn HE. Report of the New England Regional Infant Cardiac Program. Pediatrics, 1980; 65(2) Suppl : 375-461..
4. Jordan SC, Scoll O. Heart disease in Paediatrics. 3rd edition. London: Butterwoths, 1989:38.
5. Abdulla R. What is the prevalence of congenital heart disease? Ped Cardiol 1997; 18: 268.
6. Malik A: Congenital and Acquired heart disease. A survey 7,062 Persons, Bangladesh Medical Research council Bulletin.2: 115, 1976.
7. Malik A : Problems of Cardiovascular disease in Bangladesh & other developing country. Proceeding of the Bangladesh-Japan joint conference on CVD, Dhaka, Bangladesh, 1984
8. Jackson M, Walsh KP, Peart I, Arnold R. Epidemiology of congenital heart disease in Merseyside – 1979 to 1988. Cardiol Young 1996: 6:272-280.

9. Bernstein D. Congenital heart disease. In Behrman RE, Kligman RM, Jenson HB, 17th ed. Nelson textbook of Pediatrics. Philadelphia: Saunders, 2004; 1499-1553.
10. Kitchiner D J. Cardiovascular disease. In: McIntosh N, Helms PJ, Smyth RL, 6th ed. Forfer & Arneil's Textbook of Pediatrics. Edinburgh: Churchill Livingstone, 2003; 815-888
11. Bloomfield P, Bradbury A, Grubb NR, Newby DE. Cardiovascular Disease. In: Boon NA, Colledge NR, Walker BR, 20th ed. Davidson's Principle and Practice of Medicine. Edinburgh: Churchill Livingstone, 2006; 519-646.
12. Camm AJ, Bunce NH. Cardiovascular Disease. In: Kumar P, Clark M, 6th ed. Kumar & Clark Clinical Medicine. Edinburgh: ElsevierSaunders, 2005; 725-872.
13. Hussain M, Hossain M, Amin SK, Molla MR. Pattern of Congenital Heart Disease in Dhaka Shishu Hospital. D S (Child) H J 1992; 8: 35-46.
14. Mollah MAH, Begum NA, Islam MN, Mahmud RS, Haq MA, Nahar N, Rashid MA.Clinical Profile of Congenital Heart Diseases (CHD): An Analysis of 218 Cases. Bangladesh heart J 2002; 17: 62-67.
15. Rahman S, Ahmed MN, Rahmatullah KHI, Alam MS. The Incidence of Congenital Heart Diseases Diagnosed by Non-Invasive Technique – Ten Years Study in Bangladesh. D S (Child) H J 1992; 8 : 5-15.
16. Siddique FM, Kamal SMM, Huq KMHSS. Clinical Presentation of Congenital Heart Disease in hos[italized patients. Bangladesh Heart Journal 1989; 4: 13-17.
17. Begum NNF, Ahmed QS. Pattern of Heart disease among neonates and their outcome: one year experience in non- invasive cardiac laboratory of Combined Military Hospital, Dhaka. Bangladesh J child health 2001; 25: 48-52.
18. Rao VS, Reddy R. Profile of congenital heart disease in children. Indian J Pediatr 1974; 41: 244-248.
19. Vashestha VM, Kalra A, Kalra K, Jain VK. Prevalence of Congenital Heart Disease in School Children. Indian J Pediatr. 1993;30: 1337-1340.
20. Khalil A, Aggarwal R, Thirupuram S, Arora R. Incidence of Congenital Heart Disease among Hospital Live Births in India. Indian J Pediatr. 1994; 31: 519-527.
21. Silove ED. Assessment and management of congenital heart disease in the newborn by district pediatrician. Archives of Diseases in childhood 1994; 71-74
22. Hag AI. Pattern of Congenital Heart Disease in Sudanese Children. East Afr Med J 1994; 71: 580-586.
23. Keith JD. Ventricular septal defect. In: Keith JD, Rowe RB, Viad P, 3rd ed. Heart disease in Infancy and childhood. Newyork: Mac Millan publishing Co., 1978; 337-350 25. 24. Naik S, Tandon R, Gopinath N. Tetralogy of Fallot : a clinical profile. Indian Heart J 1972; 24: 14-15.
24. Naik S. Impact of prenatal risk factors on congenital heart disease in the current era. J Am Heart Assoc. 2013;2:e000064.[PubMed]

Cite this article: Rajsinh Mohite Pattern and Clinical Profile of Congential Heart Disease (CHD) in Infancy and Childhood. J. Cardiovascular Disease Res. 2020; 11 (2): 232 – 236