International Journal of Applied Research 2016; 2(5): 314-318

ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2016; 2(5): 314-318
www.allresearchjournal.com
Received: 24-03-2016
Accepted: 25-04-2016

Padedam Venkata Raghavaiah
Post Graduate, Dr. D.Y Patil Medical College, Sant Tukaram Nagar, Pimpri, Pune.

Dr. Harsh Gajjar
Post Graduate, Dr. D.Y Patil Medical College, Sant Tukaram Nagar, Pimpri, Pune.

Dr. Sandeep
Post Graduate, Dr. D.Y Patil Medical College, Sant Tukaram Nagar, Pimpri, Pune.

Dr. Shailaja Mane
Prof and Head of the Unit, Dr. D.Y Patil Medical College, Sant Tukaram Nagar, Pimpri, Pune.

Dr. Sharad Agarkhedkar
Prof and Head of the Dept, Dr. D.Y Patil Medical College, Sant Tukaram Nagar, Pimpri, Pune.

Correspondence
Padedam Venkata Raghavaiah
Post Graduate, Dr. D.Y Patil Medical College, Sant Tukaram Nagar, Pimpri, Pune.

Clinical profile of congenital heart diseases of children in a Tertiary care centre

Padedam Venkata Raghavaiah, Dr. Harsh Gajjar, Dr. Sandeep, Dr. Shailaja Mane, Dr. Sharad Agarkhedkar

Abstract
Introduction: Congenital heart disease (CHD) is defined as abnormality in 'cardio circulatory' structure or function that is present since birth. Incidence being 8 CHD's per 1000 live births. Early establishment of diagnosis is important as newer available treatment modalities can significantly decrease mortality and morbidity. With limited resources in developing countries like India clinical acumen still forms the back bone of diagnosis and later to be confirmed by echocardiography and to deliver the appropriate management at the right time.
Aims and Objectives: To study the correlation between clinical diagnosis [Detail history/clinical examination/CXR/ECG] and 2D Echocardiography diagnosis.
Methodology: Patients from newborn to 12 years of age with features suggestive of congenital heart disease admitted in department of pediatrics, Dr. D.Y. Patil Medical College and Research Centre, Pune were enrolled during study period i.e. October 2013 to September 2015 who fulfilled the inclusion and exclusion criteria.
A standard proforma was used during initial evaluation to get the detailed history and the examination findings along with CXR and ECG were evaluated and clinical diagnosis is ascertained and subjected to 2D echocardiographic evaluation to confirm the diagnosis.
Results: Out of 54 cases 5 were clinically diagnosed as cyanotic CHD(TOF 7.4%, TGA+VSD 1.8%) and 49 as acyanotic CHD(VSD 29.6%, ASD 25.9%, PDA 25.9%, CoA 3.7%, AS 1.8%, PDA+CoA 1.8%, ASD+VSD 1.8%). Clinic-echocardiographic diagnosis is correlated, partially correlated and not correlated in 68.5%, 18.5% and 13% of cases respectively.
Conclusion: Properly carried out clinical examination, X-ray and ECG evaluation are important tools in arriving at a near accurate diagnosis in CHD. However, to confirm the diagnosis echocardiography has to be carried out. Until sophisticated diagnostic tools are widely available in developing countries, thorough clinical examination, chest X-ray, ECG has a Significant role to play in arriving at a near accurate diagnosis.

Keywords: Congenital heart disease, Echocardiography, Clinical diagnosis.

1. Introduction
Congenital heart disease (CHD) is defined as an abnormality in 'cardiocirculatory' structure or function that is present since birth, even though it may be discovered later [1]. CHD remains the leading cause of death in children with malformation [2]. Incidence being 8 CHD's per 1000 live births [3]. Physiologic and structural changes may 'continue', for instance a bicuspid aortic valve may take decades to calcify to present as overt Aortic stenosis or conversely the malformations may 'vanish' as in spontaneous closure of Ventricular Septal Defect [4]. Thus congenital heart defects are not only a fixed anatomic abnormality that appear at birth but instead are dynamic anomalies that originate in the early embryo, evolve during the course of extra uterine life. With the currently available treatment modalities over 75% of infants born with critical heart disease can survive beyond the first year of life and many can lead a near normal life thereafter [5].
With limited resources in developing countries like India clinical acumen still forms the back bone of diagnosis and treatment. The clinical profile of CHD needs to be thoroughly studied and analyzed to facilitate early detection and diagnosis, later to be confirmed by echocardiography and to deliver the appropriate management at the right time. It would also allow the physician to identify relatively unnoticed syndromes and act swiftly to do the needful.

2. Aims and Objectives

To study the correlation between clinical diagnosis [Detail history/clinical examination/CXR/ECG] and 2D Echocardiography diagnosis.

3. Methodology

3.1 Materials and Methods

3.1.1 Source of Data

The source of data is from pre tested proforma. Which takes in account clinical history, general physical examination, relevant investigations (CXR/ECG) and ascertaining them clinical diagnosis and correlating them with the 2D echocardiography.

3.1.2 Study Design: Cross- sectional prospective study.

3.1.3 Sample Size: 54 cases.

3.2 Plan of study

3.2.1 Inclusion Criteria

a) Age group newborn to 12 years of age.
b) Patients with features suggestive of CHD (cyanotic spells, breathlessness, easy fatigability, feeding difficulties,), admitted in NICU, PICU, Postnatal wards, IPD or attending OPD with echocardiographic proof of CHD.

3.2.2 Exclusion criteria

a) Refusal to give informed consent b) Acquired heart diseases (rheumatic fever, myocarditis etc.).

3.3 Methods

During the study period total 54 cases were enrolled in this study, who attended Dr. D. Y. Patil medical college, hospital and research Centre who fulfilled inclusion Criteria then obtained appropriate consent in a prescribed form and duly signed by the Parents in a prescribed format.

After inclusion in the study in each case a through history was taken followed by a detailed examination and the observations were recorded in a prescribed proforma.

History and Physical Examination revealed a 'provisional clinical impression' and subsequently patient was subjected to routine test, ECG and roentgenographic studies. After this the final diagnosis was assigned and designated termed clinical diagnosis. Correlation of data was done after assigning a final clinical diagnosis to each patient and subjecting them to echocardiographic studies. The clinico echo correlation was obtained and results were analysed. As this is an descriptive study after discussing with the statistician as no statistical methods are applicable only ratios and percentages were used for evaluation.

4. Results

4.1 Age Distribution

Table 1: Distribution of CHD by Age Groups

Age Group	Number	Percent
Below 1 yr	22	40.7
1-5 yr	25	46.3
5+	7	12.9
Total	54	100.0

54 cases were sorted in 3 class intervals. Infancy constituted 40.7%, 1 to 5 years were 46.3%, above 5 years were 13% of cases. The youngest case in study was 1day and eldest was 12 years.

4.2 Sex wise Distribution

Table 2: Distribution of CHD by Sex Ratio

SEX	Frequency	Percent
Male	33	61.1
Female	21	38.9
Total	54	100.0

In the present study 61.1% cases were seen in males and 38.9% in females. The overall distribution of CHD in males is significantly higher in this study.

4.3 Modes of Presentation

Table 3: Distribution of CHD by Modes of Presentation

Complaints	No. of cases	Percent involvement of (within all CHD)	Percent involvement of (within disease)	
			ACHD	CCHD
Chest retraction	31	57.4	59.1	40.0
Breathlessness	19	35.1	32.6	60.0
Palpitations	2	3.7	4.1	0
Cough	29	53.7	57.1	20.0
Cyanosis	6	11.1	2.0	100.0
Cyanotic spells	2	3.7	0	40.0
Feeding difficulty	8	14.8	8.1	80.0
Edema	5	9.2	10.2	0
Fever	13	24.0	26.5	0
FTT	14	25.9	22.4	60.0

Chest retraction and cough were the first two rank's in symptoms in CHD, overall cyanotic spell and pulsations in the chest were least frequent presenting complaint among the variable studied. Chest retraction, cough and breathlessness were first three symptom 'ranks' amongst ACHD. In case of CCHD cyanosis, feeding difficulty and breathlessness were the first three 'ranks' symptoms, cyanosis seen in 100% of CCHD cases. Cyanotic spells seen though only in 40% of CCHD were specific to CCHD as it was not found in ACHD.

4.4 Clinical Findings

Table 4: Distribution of Clinical Findings in CHD

Clinical findings	Frequency	Percent	Percent involvement of	
			ACHD	CCHD
Cyanosis	5	9.2	0	100.0
Edema	6	11.1	12.2	0
Clubbing	5	9.2	4.0	60.0
Raised JVP	4	7.4	6.1	20.0
Precordium bulge	13	24.0	20.4	60.0
Precordium pulsations	23	42.5	42.8	40.0
Parasternal heave	13	24.1	20.4	60.0
Thrill	27	50.0	46.9	80.0
PP 2	10	18.5	20.4	0

Precordial pulsation was 2nd most prevalent finding in a case of CHD seen in 42.5% after thrill which was present in upto 50.0% of the cases. Further, cyanosis and clubbing were present in 9.2 and 9.2% respectively, none of the ACHD had cyanosis.

4.5 Chest X Rays

Table 5: Distribution of CHD by X-Ray Findings

	No. of cases	Percent
Normal	13	24.1
CDM	22	40.7
CDM + Plethora	13	24.1
CDM + Oligemia	4	7.4
Normal cardiac size + Oligemia OOOOLIGENIA Oligemia	1	1.8
CDM+LV	1	1.8
Total	54	100.0

CDM - cardiomegaly, - CDM + LV - cardiomegaly & LV configuration of apex, CDM + Plethora - cardiomegaly &Increased Bronchovascular markings, CDM + oligemia - cardiomegaly & decreased bronchovascular markings, Normal cardiac size + Oligemia.

Twenty two of fifty four cases of CHD (40.7%) had a cardiomegaly on CXR, whereas 24.1% each had plethora and normal cardia.

4.6 ECG

Table 6: Distribution of ECG Changes in CHD

.	Frequency	Percent
Normal	19	35.2
LAD/LVH	21	38.9
RVH/RAD	8	14.8
CVH/BVH	2	3.7
rsr' pattern	2	3.7
rsr' pattern + RVH/RAD	1	1.8
RVH/RAD /rsr'+Peak p waves	1	1.8
Total	54	100.0

In summary 74.8% of all CHD's had an abnormal ECG findings, most prevalent was LVH/LAD, followed by normal in 35.2% cases and in 14.8% cases RVH/RAD was present.

4.7 Clinical Diagnosis

Table 7: Distribution of CHD by Final Clinical Diagnosis

	No. of cases	Percent
VSD	16	29.6
ASD	14	25.9
PDA	14	25.9
CoA	2	3.7
TOF	4	7.4
AS	1	1.8
PDA+CoA	1	1.8
ASD + VSD	1	1.8
TGA +VSD	1	1.8
Total	54	100.0

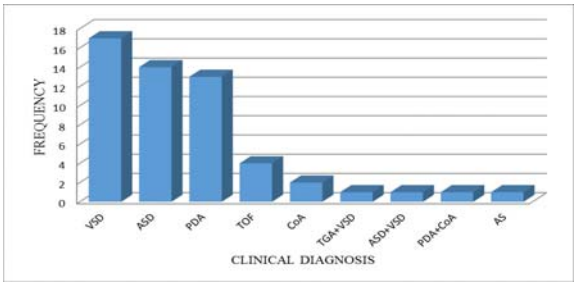

Fig 11: CHD by Final Clinical Diagnosis

Most commonly diagnosed lesion 'clinically' was VSD (29.6%) followed by ASD, PDA (25.9%) each and then TOF in 7.4%.

4.8 Echocardiography Diagnosis

Table 8: Distribution of CHD in Study (Confirmed By Echocardiography)

CHD	No. of cases	Percent
VSD	11	16.7
ASD	14	24.1
PDA	9	11.1
COA	1	1.8
TOF	4	7.4
VSD + ASD	2	9.2
VSD + PDA	1	3.7
ASD+PDA	2	7.4
PAPVC + ASD	1	1.8
ASD+VSD+PDA	1	1.8
VSD + PDA+PA	1	1.8
VSD+PDA+CoA	1	1.8
TGV+VSD+PS	1	1.8
VSD+CoA	1	1.8
BAV	2	3.7
MVP	1	1.8
CAF	1	1.8
Total	54	100.0

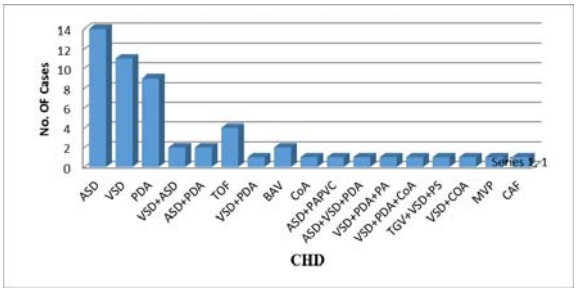

Fig 12: CHD in Study (Confirmed By Echocardiography)

Among the 54 cases (confirmed by Echo), ASD by far remains the most common CHD and was present in 24.1%. the next common lesions were VSD (16.7), PDA(11.1%) and TOF (7.4%).

4.9 Clinico- Echo Correlation

Table 9: Distribution of Chd by Clinico-Echo Correlation

	No.of cases	Percent
Correlated	37	68.5
Partially correlated	10	18.5
Not Correlated	7	13.0
Total	54	100.0

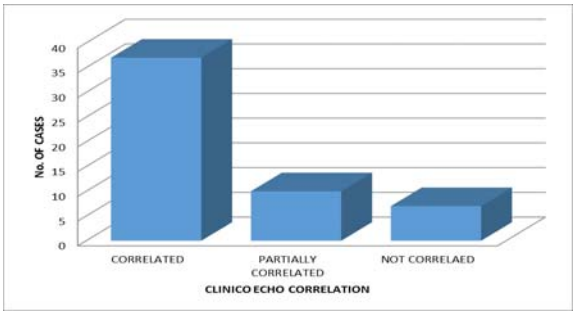

Fig 13: CHD by Clinico-Echo Correlation

A) ACHD only (by no. of cases correlated)
Clinical Diagnosis

Table 10: A & B Distribution of ACHD & CCHD by Clinico-Echo Correlation

ECHO	VSD	ASD	PDA	COA	PDA+CoA	AS	ASD+VSD	
VSD	11							11
ASD		12						12
PDA	1		9					10
COA				1				1
VSD + ASD	2						1	3
VSD + PDA			1					1
ASD+PDA			2					2
PAPVC + ASD	1							1
ASD+VSD+PDA			1					1
VSD + PDA+PA			1					1
VSD+PDA+CoA					1			1
VSD+CoA				1				1
BAV		1				1		2
MVP	1							1
CAF			1					1
	16	13	15	2	1	1	1	

B) CCHD Only (by No. of cases correlated)

		Clinico-Echo-Correlation		Total
		TOF	TGA +VSD	
ECHO	TOF	4	-	4
	TGV+VSD+PS	-	1	1
Total		4	1	5

Clinically diagnosed cases were found to correlate with echo diagnosis completely in 68.5% of cases, and partially in 18.5% of cases. However, in 13% of cases clinically diagnosis was wrong when confirmed by echocardiography. Further, when studied only for ACHD we found statistical significant in distribution pattern. Among the 16 clinically diagnosed VSDs only 11 cases found to be VSD in reality echocardiography confirmed, 5 others were actually VSD + ASD (2), PAPVC+ ASD (1), MVP(1), PDA(1) when confirmed by echocardiography deriving a correlative value of 11/16 (68.7%) in case of VSD. Similarly in case of ASD (12/13=92.3%), PDA (9/15=60.0%), CoA (1/2 = 50.0%), PDA+CoA (1/1=100%), ASD+VSD (1/1=100%), TOF (4/4=100%) were the correlation between clinical and echo diagnosis.

5. Discussion

In the present study 54 cases of CHD's were enrolled by simple random technique. Among the major groups in CHD's studied, 90.7% were ACHD and 9.3% CCHD. CHD's were sorted by three age groups**,** infancy, under five years and above five years. It was observed that under five were the most prevalent group with 46.3%, followed by infancy and above five in 40.7% and 13.0% respectively. About 87% of all CHD's were 'under five' including Infants, The frequency of CHD in infancy was 51.66% by Suraj Gupta *et al*. [6], 46% by Tank *et al*, [7] Begic *et al*. [8] noted in upto 70% in infancy. And the present study is matching closely in age group infancy with Tank *et al*. [7].
(36.7%, 40.7% respectively). The male: female ratio in the present series was 1.57:1, with males accounting for 33 cases and females 21 cases. Tank *et al*. [7] observed 1.88:1. The modes of presentation of CHD seen in this study includes most frequently chest retraction (57.4%) followed by cough (53.7%), breathlessness (35.1%), failure to thrive (25.9%), feeding problems (14.8%). When ACHD analyzed alone, it was noted that chest retraction is the most frequent presenting complaint in 59.1%, cough (57.1%), breathlessness/easy fatigability in (32.6%), followed by FTT (38%). In the analysis of presenting symptoms of CCHD it was observed that cyanosis was the most common presenting complaint in 100% cases followed by feeding difficulty (80%), breathlessness (60%), failure to thrive (60%), Chest retraction in (40%) cases and cyanotic spells in (20%) cases. Presence of cyanosis and cyanotic spell as a mode of presentation is significant in case of CCHD, its absence is significant in a case of ACHD. Tank *et al*. [7] studied 147 subjects and deduced the symptomlogy of CHD and found breathlessness to be present in 74.83% of all CHD's followed by symptoms of LRTI(44.89%), Cyanosis (37.4%), FTT (38.77%), CCF (30.6%), refusal of feeds (30.6%), cyanotic spell in 12.92%.
Suraj Gupte *et al*. [6] in a study at Jammu and Kashmir in 60 subjects reported presenting complaints of CHD to be 45.8% (breathlessness), 36.66% (failure to thrive), 35.77% (RRTI), 21.66% (cyanosis). However, interestingly 58% of all CHD's were found to be asymptomatic in a study conducted by Kasturi *et al*. [9] in Bombay perhaps due to increased cases of neonatal period detected by routine examination.
Most common clinical findings were the presence of thrill (50.0%) followed by precardial pulsations (42.5%), parasternal heave (24.1%). precardial bulge (24.0%). Among ACHD most common clinical finding was the presence of thrill (46.9%) followed by precardial pulsations (42.8%), precardial bulge (20.4%), parasternal heave (20.4%), palpable P2 (20.4%) but nobody had cyanosis. Thrill is the most common clinical finding overall. In case of ACHD, the thrill is due to increase in turbulence of blood flow and it is a relatively easy clinical sign to detect Among CCHD frequent clinical finding was cyanosis (100%), thrill (80%), precardial pulsations, clubbing, heave, precardial bulge (60%). Clinical signs in CCHD were remarkable in that cyanosis was seen in 100% of cases, precardial

pulsations and clubbing in 60% of cases. Lata V *et al*.[32] studied the clinical findings of CCHD alone and found cyanosis and clubbing in 100% cases, Dyspnea in 96% cases, squatting episodes in 44% cyanotic spells in 33.33% cases, respiratory tract infection in 11.11% cases. The symptomology and signs of ACHD and CCHD in present series were comparable to standard textbooks [1, 2, 4, 10, 11].

In the present series, there was accurate diagnosis in 68.5% of cases (37 cases) especially when dealing with isolated lesions and partially correct in 18.5% cases (mostly multiple lesions) but absolutely wrong in 13% cases (7 cases). Shibata *et al*. [12] made observations and recorded 43% of accuracy of clinical diagnosis in CHD. Among the 54 cases, one patient with severe co-arctation of aorta underwent resection and extended end to end anastomosis, one patient with Transposition of great arteries underwent PA band followed by Bi directional glenn with PA ligation. Because of early intervention in these cases, they were asymptomatic then after. Pestana C *et al*. [13] studied the clinical echo correlation in CHDs in Mayo Clinic, Rochester, USA and were able to clock 80% accuracy. The study was conducted by an experienced paediatric cardiologist. Klewer *et al*. [14] in a study of 154 subjects derived a clinical-echo correlation of 81% in the USA.

6. Conclusions

CHD remains the leading cause of death in children with malformation. Hence its detection, is of paramount importance because early detection and intervention reduces the mortality and morbidity.

As in countries like India with limited resources clinical acumen forms the backbone for diagnosis for CHD. But clinical diagnosis should be confirmed with 2D Echocardiography which is an gold investigation for diagnosis. Until sophisticated diagnostic tools are widely available in developing countries, thorough clinical examination, chest X-ray, ECG has a Significant role to play in arriving at a near accurate diagnosis

In the present study majority of cases were accurately diagnosed and few were partially diagnosed. 2cases were managed on emergency basis as cases were picked up early. This implies regular clinical practice improves the skill of clinical diagnosis and helps in early intervention where ever required.

7. References

1. Webb GD, Smallhorn JF, Therrein J. Congenital Heart Disease In: Zipes, Libby, Bonow, Braunwald, editors. Braunwalds Heart Disease, 7th Edition, Philadelphia: Saunders, 2005, 1489-1547.
2. Bernstein D. Congenital heart disease. Kleigman, staton, ST Geeme, Schor, editors. Nelson Textbook of Pediatrics, 20th Edition, International: Elsevier, 2015, 2157-2170.
3. Frommelt MA, Frommelt PC. Advances in echocardiographic diagnostic modalities for the pediatrician. Pediatric Clinics of North America, Philadelphia: Saunders 1999; 46(2):427-39.
4. Perloff JK. The clinical recognition of congenital heart disease, 5th edition, Philadelphia: Saunders, 2003.
5. Saxena A. Congenital heart disease in India: A status report. Indian Journal of Pediatrics. 2005; 72(7):595-598.
6. Gupte S, Saini G. Congenital heart disease: Clinico echocardiographic profile in children. Asian Journal of Pediatric Practice. 2004; 8(2):30-34.
7. Tank S, Malik S, Joshi S. Epidemiology of CHD among hospitalized patients. Bombay Heart Journal. 2004; 46(2):144-150.
8. Begic H, Tahirović H, Dinarević SM, Ferković V, Atić N, Latifgić A. Epidemiological and clinical aspects of congenital heart disease in children in Tuzla Canton, Bosnia. European Journal of Pediatrics. 2003; 162:191-3.
9. Kasturi L, Amin A, Mashmkar VA. Congenital Heart Disease: Clinical Spectrum Indian Pediatrics 1999; 36:953-954.
10. Shrivastava S, Tandon R. Congenital heart disease. In: Ghai OP, Gupta P, Paul VK, editors. Ghai Essential Pediatrics, 6th Ed, New Delhi: O.P. Ghai, 2004, 393-422.
11. Allen HD, Clark EB, Gutgesell HP, Driscroll DJ (Eds). In Moss and Adam's heart disease in infants, children and adolescents (including fetus and young adults), 6th Ed, PA, Lippincott, William and Wilkins, 2003.
12. Shibata H, Matsuzaki T, Hayashi N, Morishima A, Seino T. Congenital heart disease in high school and college students. Japan Heart Journal. 1997; 18:457.
13. Pestana C, Weidman WH, Swan HJC. Accuracy of preoperative diagnosis in CHD. American Heart Journal. 1966; 72(4):446-50.
14. Klewer SE, Samson RA, Donnerstein RL, Lax D, Zamora R, Goldberg SJ. Comparison of accuracy of diagnosis of congenital heart disease by history and physical examination versus echocardiography. American Journal of Cardiology. 2002; 89: 1329-31.