



PATTERN OF CONGENITAL HEART DISEASE IN CHILDREN PRESENTING TO A SECONDARY CARE UNIT IN A DIVISIONAL HEAD QUARTER HOSPITAL

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ABSTRACT:

OBJECTIVE: To assess the prevalence and pattern of congenital heart disease in children of age 16 year and less at a secondary care unit.

PATIENTS AND METHODS: This retrospective study was conducted on children undergoing echocardiography from May 2012 to December 2012 (eight months) for possible heart disease in a single secondary care cardiac center at Siddique Sadiq Memorial Trust Hospital, Gujranwala - a referral center for pediatric and adult cardiac services in central Punjab, Pakistan.

RESULTS: Out of 1176 patients undergoing echocardiography, 1006 had a cardiac lesion (85.54% of the total patients) while 170 were normal (14.46%). Congenital cardiac lesions were found in 450 (44.7%) patients, while 556 patients (55.2%) had rheumatic heart disease. Patient with congenital heart disease were further divided into sub groups. Majority of the patients in the acyanotic group had isolated ventricular septal defect (28.16%) while Tetralogy of Fallot with pulmonary atresia was the most common lesion in the group of cyanotic heart disease (6.82%).

CONCLUSION: Congenital heart defects were the second most common heart defects in pediatric population presenting to a secondary care centre. VSD is the commonest acyanotic and TOF with pulmonary atresia was the commonest cyanotic defect.

KEY WORDS: Congenital heart disease / defect (CHD), Acyanotic CHD, Cyanotic CHD, Ventricular Septal Defect (VSD).

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INTRODUCTION:

The incidence of CHD is reported up to 8/1000 in live birth in the Westren world^{1,2}. In a developing country like Pakistan it is very difficult to get a real and accurate figure of incidence of congenital heart disease. A study done at Aga Khan University hospital by Hassan et al showed prevalence rate of CHD upto 4/1000 live, births in Karachi³. A study done in India has reported a similar incidence in the neighboring country as well.⁴ In countries like ours it is very difficult to have a true estimate of the prevalence of CHD as majority of the births still take place at home and routine neonatal screening is not common due to financial constraints and other cultural and reli-

gious issues. Data on immigrants from the Indian Subcontinent however, shows a higher incidence of congenital heart diseases when compared to the Caucasian population.⁵

There are studies from tertiary care centers or main stream teaching hospitals in Pakistan looking at the prevalence and pattern of congenital heart defects in children⁶⁻¹⁰. These would however be biased as patients with only severe lesions generally make it to these hospitals and studies done on general population would be more representative of the general prevalence¹¹. We reviewed pattern of congenital heart disease in all those children presented at Siddique Sadiq Memorial Trust Hospital, a secondary care unit at a divisional head quarter Gujranwala, Pakistan. This would be a mix of both general population from a very populous city of Pakistan and referral to a secondary care center as well. It may not give the true incidence or prevalence of the CHD in the community but will add to the limited pool of knowledge about prevalence of congenital heart disease in Pakistan.

PATIENTS AND METHODS:

All patients aged 16 or less from both genders, with suspected heart disease and referred to Siddique Sadiq Memorial Trust Hospital from May

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2012 to December 2012, underwent echocardiography (Xario Toshiba). Two qualified & experienced echocardiographers performed the echocardiography test. The data was reviewed for the age at presentation and the type of congenital heart disease. The defects were divided into: two main sub-groups, cyanotic heart defect and acyanotic heart defect. Congenital heart disease (CHD) was defined as a gross structural abnormality of heart or intrathoracic great vessels that is actually or potentially of functional significance at birth¹². Each patient with congenital cyanotic heart defect and congenital acyanotic heart defect was further classified into a single diagnostic category. Those cases with multiple cardiac defect were classified according to a hierarchical assignments used by the Baltimore - Washington infant study¹². Some patients referred with innocent murmur or suspicions of heart disease were found to be the normal on echocardiography. They were grouped separately and excluded from the study. The cases which were identified as LV dysfunction / cardiomyopathy were also excluded from the study.

RESULTS:

A total of 1176 children <16 yr of age presented to Siddique Sadiq Memorial Trust Hospital, from May 2012 to December 2012. Amongst these 170 patients were found to have a normal heart during echocardiography, so were excluded from study (14.46%). 1006 patients were found to have a heart disease, 450 (44.71%) patients have CHD and 556(52.29%) of patients have RHD. Of these 450 patients, 279 (62% of CHD) had acyanotic heart defect and 171 (38% of CHD) patients had cyanotic congenital heart defect. (Table 1)

Ventricular septal defect was the most common congenital heart disease and found in 128 patients (28.16%). The mean age of patient was 4.6 years. There were mainly two age groups, infants less than 12 months (mean age 5.4 months) with failure to thrive and repeated chest infections and the other group was early school going kids 3.5 - 4 years (mean age 3.76 years). (Table 2)

Of patients with VSD, 81 patients had perimembranous defect (63.28% of all patients having VSD), 38(29.68%) patients had muscular defect and 9(7.03%) had doubly committed sub atrial

Table 1. The relative frequency and type of lesion in children with congenital heart disease.

Type of Cardiac lesion		Number of Patients (%)	
Patients with CHD	Acyanotic CHD	450 (44.71)	279(62%)
	Cyanotic CHD		171(38%)
Patients with RHD		556(55.29)	

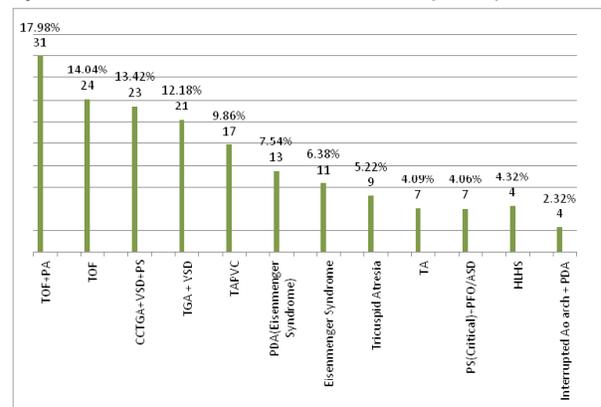
Table 2: Distribution of patients with acyanotic heart disease. No of patients 279 (62%).

Lesion	No of patients	Percentage Acyanotic heart disease	Percentage in total CHD	Mean age years
VSD	128	46.08%	28.16%	4.6
ASD	39	14.04%	8.58%	9.7
PS	34	12.24%	7.48%	5.7
PDA	29	10.44%	6.38%	1.5
VSD+ASD	22	7.8%	4.8%	2.5
AS	11	3.96%	2.42%	8.1
COA	09	3.24%	1.98%	5.12
CcTGA	7	2.52%	1.54%	7.3

Table 3: local data of patients with congenital heart defects

Hospital	National institute of Cardiovascular Diseases	Punjab institute of Cardiology	Siddique Sadiq Hospital
City	Karachi	Lahore	Gujranwala
Year	1980-83	1996-2001	2012
No. of Patients	2020 pts	6620 pts	1006 pts
VSD	39.9%	32.1%	28.16%
TOF	24.3%	16.1%	5.18%
ASD	8.2%	13.2%	8.58%
PDA	7.2%	12.8%	6.38%
PS	8.1%	8.03%	7.48%
Complex CHD	0.7%	5.2%	-
TGA	3.1%	3.4%	-
AS	3.8%	3.0%	2.42%
TAPVD	1.4%	2.5%	3.74%
COA	0.49%	1.34%	1.98%
AVSD	0.69%	1.6%	3.79%
OTHER			28.82%

Figure 1: Distribution of patients with cyanotic heart disease, n=171 (38%)



VSD.

We had 22 patients with combined lesion of VSD + ASD (which is 4.8% of the total CHD and 7.8% of acyanotic heart disease). The second most common malformation found was atrial septal defect (ASD). A total 39 patients were found to have isolated atrial septal defect which is (8.58% of total congenital heart disease and 14.04% of acyanotic heart disease). Mean age was 9.7 years. Majority of these patients 28(71.79%) had secundum ASD



(fossa ovalis type), 8(20.51%) patients had primum ASD, 2(5.12%) patients had sinus venosus type ASD. Only 1(2.56%) patient had coronary sinus ASD. Other congenital defects are described in Table 1. Local data of CHD is presented in table 2. Cyanotic heart disease is also common in our children as shown in figure 2 showing details of various cyanotic CHD.

DISCUSSION:

Siddique Sadiq Memorial Cardiac Trust Hospital is a secondary care cardiac center and patients referred to this institute are mostly from the city and suburbs of Gujranwala. Gujranwala is an industrial city with a population is over 2.6 million. Majority of these belong to labour class & have a poor socioeconomic status. Due to religious factors, poor income, poor health services, most births still take place at home, so it is nearly impossible to screen all the new born for congenital anomalies. The data presented in this study was confined to hospital attendance but there may be a large number of cases which do not have any access to hospital or which died earlier before reaching the hospital due to life threatening lesions. So it is really difficult to get exact information of prevalence & incidence of congenital heart disease in the pediatric age group of the city of Gujranwala.

The information & data provided in this study is however comparable with other local studies (Table 3).

This study showed that among CHD one third patients have cyanotic heart disease & two third patients have acyanotic heart disease which correlates very well with International data & data derived from previous local studies.²⁻¹²

VSD is the most common lesion in our study group. Patients of VSD are almost same in our study when compared to all previous available local cardiac centers studies, 32.1% in Punjab Institute of Cardiology Lahore, 39.9% in National Institute of Cardiology Karachi & (28.16%) in Siddique Sadiq Memorial Trust Hospital, Gujranwala. The subtypes were also in the same range with perimembranous VSD being the commonest with a prevalence of 63.28% followed by muscular VSD (29.68%) and doubly committed sub atrial VSD was the least found type.^{6,7} The second most common congenital heart lesion found in children

was atrial septal defect. It has prevalence of 8.58% which is almost same as in other local studies done at NICVD, Karachi (8.2%) & PIC, Lahore (13.2%). Next 3rd highest found pediatric cardiac lesion in our study was pulmonary stenosis (7.48%) which was 8.1 % at NICVD Karachi and 8.03% PIC Lahore. These figures clearly indicate that the pattern of congenital heart defects in four most common cyanotic CHD is similar all over the country.

At Siddique Sadiq Memorial Trust Hospital, Gujranwala the prevalence of PDA was 6.38% while at PIC Lahore was 12.8% and 7.2% at NICVD Karachi. In our study it is really very hard to present the exact prevalence of patients with PDA because our patients belong to slightly older age group. They had either small PDA or murmur was picked by physician due to repeated chest infections who found murmur during examination & he referred them to us. As a significant number of patients with PDA are preterm, this would also underestimate the prevalence in our study. Amongst cyanotic congenital heart disease Tetralogy of Fallots is highest in NICVD Karachi (24.3%) & PIC Lahore (16.1%). In our study group the commonest cyanotic CHD was severe form of Tetralogy of Fallot with pulmonary atresia. This indicates that the patients either present late or more severe forms are likely to present at a cardiac center.

This study is important in two respects. Rheumatic heart disease was still the commonest cause of presentation in these children coming to a secondary care center (55%). Recent literature involving community and school based studies from Pakistan has also confirmed that rheumatic heart disease continues to be an important cause of morbidity and mortality in our paediatric population despite drastic drops in the incidence of rheumatic heart disease in the rest of the world.¹³⁻¹⁵ Secondly the pattern of congenital heart disease remains the same and relatively older population presenting to a secondary care center essentially excludes many children with critical congenital heart disease seen in studies from paediatric hospitals.^{16,17}

CONCLUSION:

Rheumatic Heart Disease is still the commonest heart defect in children presenting to a secondary care center at a divisional headquarter. Congenital Heart defects were the second most common heart defects in this population group. In acyanotic group, isolated VSD is the commonest type of defect while TOF with pulmonary atresia was the commonest cyanotic defect.



Author's Contribution

MAS: Conducted the study and wrote the article.
MAA: Helped in conducting the study and was research coordinator.
IW: Re-analyzed data, reviewed and corrected the article.
MS, MHA and AR were consultant incharge of the study and gave frequent advice.

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