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Original Article

Pattern of Congenital Heart Diseases in Paediatric Age Group

Hafiz Muhammad Umer[1], Muhammad Usman Arshad [1], Furqan Mudassar [1], Abd Ul Slam[1], Saad Junaid [1], Rai Muhammad Asghar [2], Faiza Aslam [3]

1. Final year,Rawalpindi Medical University, Rawalpindi;2.Department of Pediatrics;3. Department of Medical Education, Rawalpindi Medical University

Abstract

Background: To determine the pattern of different types of congenital heart diseases, in paediatric age group.

Methods: In this observational cross sectional study cases of congenital heart defects (CHD) were included, through simple random sampling irrespective of age and gender. Every patient's data on echocardiographic report clearly indicating his CHD type along with age and gender was recorded. Variables of study i.e. type of CHDs, age, and gender with relative frequencies were presented separately graphically.

Results: Out of 298 diagnosed patients of CHD 156 were males and 142 were females. Isolated ventricular septal defect found to be the most common anomaly (32.6%). In combination atrial septal defect and ventricular defect were found to be most common with 5.4% burden rate. Out of 298 patients Acyanotic CHDs were 67.1% while Cyanotic CHDs were found to be 32.9%.

Conclusion: Acyanotic CHDs were found to be dominant over Cyanotic CHDs with relative percentages of 67.1% and 32.9% respectively.

Key Words: Congenital heart disease, Atrial septal defect ,Ventricular septal defect, Patent ductus arteriosus, Tetralogy of fallot, Cyanotic heart diseases, Acyanotic heart diseases.

Introduction

Congenital heart defects (CHD) are the most common birth defects globally.[1,2] In 2013 they were present in 34.3 million people globally.[2] Adults living with some type of CHD are increasing in number at a rapid pace due to availability of increasingly effective therapies.[3]

The pattern of congenital heart diseases is difficult to determine correctly as most of the data is collected from pediatric cardiology wards of tertiary health care center and mild cases of CHD like small VSDs or mild pulmonary stenosis might be treated by local physicians and not referred to the tertiary health care center[3]. Few lesions with subtle findings may be detected later in life.[4,5] Isolated VSDs are the most common form of the CHD along with ASDs, transposition of great vessels, tetralogy of fallot (TOF) and patent ductus arteriosus (PDA) which are relatively less common.[6,7] Some rare forms of CHD may be inadequately assessed because of small numbers and stochastic variations. Some neonates with severe critical type of CHD may die within few days after birth without knowing the correct cardiologic or autopsic biopsy.[8]

The precise underlying cause of CHD is still not known. It may be genetic, environmental or may possibly be a combination of both.[9] It is known that parents having congenital heart diseases have higher chance of having children with some type of CHD as well and thus there is a reason to believe that CHD incidence will rise in future.[10,11] According to some studies Shunt lesions like ASD, VSD and PDA were found to be more common in female children whereas lesions like transposition of great vessels and coarctation were predominantly seen in male children.[12] As the population of our country is growing rapidly the need to know the correct pattern of CHD is essential to properly allocate the resources needed for their proper management according to the recommended guidelines as these guidelines vary for different types of CHD.[13]

Patients and Methods

This observational cross sectional study was conducted at Paediatric Department of Rawalpindi Medical University Allied hospitals, Rawalpindi from February 2017 to July 2017. Present study population comprised of diagnosed cases of CHDs (n=298), by Echocardiography. Every patient's data on Echocardiographic report clearly indicating his CHD type along with age and gender was recorded in structured Proforma, designed for this particular study. All data was entered and then analyzed using SPSS version 22. Variables of study i.e. type of CHDs, age, and gender with relative frequencies were presented separately graphically.

Results

Out of 298 patients 156 were males 142 were females. In isolated lesions VSD was the most common (32.6%) followed by TOF (18.8%). In combination lesions most significant was ASD with VSD (5.4%)(Table1) .Acyanotic CHDs constituted 67.1%(Table 2). The most common age group for presentation of paediatric patients with CHD was between 28 days to 1 year of age (Table 3). VSD was more common among males and TOF ranked top among females (Table 4).

Table 1.Congential heart diseases- Distribution

Congenital Heart Diseases	Frequency	Percentage
Ventricular septal defect (VSD)	97	32.6
Atrial septal defect (ASD)	28	9.4
Tetralogy of Fallot (TOF)	56	18.8
Patent ductus arteriosus (PDA)	39	13.1
Transposition of great arteries (TGA)	10	3.4
Total anomalous pulmonary venous drainage (TAPVD)	4	1.3
Pulmonary atresia (PA)	7	2.3
ASD + VSD	16	5.4
VSD + PDA	9	3.0
PS + PDA	4	1.3
ASD + TGA	2	.7
ASD + PDA	5	1.7
PA + VSD	1	.3
Combination of >2 types of CHD	20	6.7
Total	298	100.0

CHD=Congenital Heart Disease; ASD=Atrial Septal Defect;VSD=Ventricular Septal Defect; PDA=Patent Ductus Arteriosus;TOF=Tetralogy of Fallot;TGA=Transposition of great Arteries; TAPVD= Total Anomalous Pulmonary Venous Drainage;PA= Pulmonary Atresia; PS=Pulmonary Stenosis.

Table 2. Congenital heart diseases - Proportions of Cyanotic and Acyanotic patients

Classification OF CHD	Frequency	Percentage
Cyanotic heart disease	98	32.9
Acyanotic heart disease	200	67.1
Total	298	100.0

Table 3. Congenital heart diseases -Age group

Age Group	Frequency	Percentage
0-28 Days	23	7.7
29 Days - 1 Year	194	65.1
1 Year - 12 Years	81	27.2
Total	298	100.0

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Table 4: Congenital Heart Disease (CHD) showing Gender Correlation

Congenital Heart Disease (CHD)		Gender		Total No (%)
		Male No (%)	Female No (%)	
(VSD)	Count	50	47	97
	% of Total	16.8%	15.8%	32.6%
(ASD)	Count	16	12	28
	% of Total	5.4%	4.0%	9.4%
(TOF)	Count	26	30	56
	% of Total	8.7%	10.1%	18.8%
(PDA)	Count	17	22	39
	% of Total	5.7%	7.4%	13.1%
(TGA)	Count	6	4	10
	% of Total	2.0%	1.3%	3.4%
(TAPVD)	Count	2	2	4
	% of Total	0.7%	0.7%	1.3%
(PA)	Count	5	2	7
	% of Total	1.7%	0.7%	2.3%
ASD + VSD	Count	11	5	16
	% of Total	3.7%	1.7%	5.4%
VSD + PDA	Count	6	3	9
	% of Total	2.0%	1.0%	3.0%
PS + PDA	Count	1	3	4
	% of Total	0.3%	1.0%	1.3%
ASD + TGA	Count	2	0	2
	% of Total	0.7%	0.0%	0.7%
ASD + PDA	Count	2	3	5
	% of Total	0.7%	1.0%	1.7%
PA + VSD	Count	0	1	1
	% of Total	0.0%	0.3%	0.3%
MELD OF >2 TYPE CHD	Count	12	8	20
	% of Total	4.0%	2.7%	6.7%
Total	Count	156	142	298
	% of Total	52.3%	47.7%	100.0%

Discussion

Congenital heart diseases are most common birth anomalies.[14] In the developing countries many children die because of CHDs, either due to limited resources or late diagnosis. Each year on an average about 1.5 million new cases worldwide add up to the existing number. In Pakistan 40000 children are born each year with any type of CHD[15]. According to an estimate one quarter of all deaths from CHD occur within the first month of life and half to two third mortalities occur between first 7 to 10 days of life.[16,17]

Many of the neonates require some sort of surgery and frequent admissions in hospitals during first year of life.[18] Most of the studies in our setup are based on data from tertiary care hospitals, so correct assessment of magnitude of CHD is difficult, because of limited access of people to these institutions. Early recognition and careful treatment of the patients is necessary to avoid early morbidity and mortality. The incidence, prevalence and pattern of distribution of CHD types vary from region to region.[19,20] In European countries the incidence of CHD varies from 3 to 12/1000 live births.[21] The Meta analysis report consisting of 114 studies from different part of the world showed that the rate of prevalence of CHD is highest 9.3/1000 live births in Asia[22]. In Pakistan the incidence is 4/1000 live births.[23]

Present study is also hospital based to look for the pattern of CHD in patients who are referred to tertiary care hospital from upper Punjab in addition to the local patients. There are many national and international researches which show the pattern of different types of CHD. According to an international research conducted in King Fahad Specialist Hospital, Buraidah VSDs were the most common CHDs with relative frequency of 38.5% followed by ASDs with relative frequency of 11.5%, pulmonary stenosis 9% and PDA 8%24. According to another research conducted nationally at National Institute Of Cardiovascular Diseases (NICVD), Karachi which shows TOF as the most common CHD lesion constituting 24.4% of the total followed by VSD 21.5%, ASD 9.3% and PDA 8.6%. In this study VSD and TOF are more common in male patients which is inconsistent to that of our study in which TOF is more common in females.[25] While studies conducted at Aga Khan University Hospital, Lady Reading Hospital Peshawar and at Hazara reported VSD as the most common a cyanotic heart defect and most common cyanotic defect was TOF which is consistent with our study.[23,26,27]

In present study VSD was the most common CHD lesion constituting about 32.6% fallowed by TOF 18.8%,PDA 13.1%, ASD 9.4% and the combination of >2 types 6.7%,which are quite similar to many national and international studies. VSD is slightly more common in male patients while TOF is more common in female patients. In combination ASD with VSD is more common lesion constituting about 5.4% of relative frequency. Acyanotic CHD lesions are more common with relative frequency of 67.1% while Cyanotic CHD lesions are 32.9% which is also consistent with many national and international studies.

Conclusion

1. Acyanotic CHDs were found to be dominant over Cyanotic CHDs with relative percentages of 67.1% and 32.9% respectively.
2. In single lesions VSD was found to be most common among a cyanotic CHDs while TOF was found to be most common among Cyanotic CHDs.
3. VSD was dominant lesion in males while TOF was chief lesion among females. In combination lesions ASD with VSD shared highest disease burden.

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