Pak Heart J

SPECTRUM OF HEART DEFECTS IN CHILDREN PRESENTING FOR PAEDIARIC CARDIAC SURGERY

Iqbal Hussain Pathan[1], Sohail Khan Bangash[2], Amin Muhammad Khawaja[3]

[1-3] Department of Cardiac Surgery , National Institute of Cardiovascular Disease , Karachi, Pakistan

Address for Correspondence:

Iqbal Hussain Pathan,

Department of Cardiac Surgery , National Institute of Cardiovascular Disease, Karachi, Pakistan

E-Mail: driqbalnicvd@gmail.com

Date Received: August 06, 2015
Date Revised: November 01, 2015
Date Accepted:November 18, 2015

Contribution
IHP conceived the idea, planned the study, drafted and critically revised the manuscript, SKB and AMK helped in acquisition of data and did statistical analysis. All authors contributed significantly to the submitted manuscript.

All authors declare no conflict of interest.

This article may be cited as: Pathan IH, Bangash SK, Khawaja AM. Spectrum of heart defects in children presenting for paediaric cardiac surgery. Pak Heart J 2016;49(01): 29 - 32.

ABSTRACT

Objective: To determine gender distribution and relative frequency of cardiac defects in children who underwent palliative or corrective cardiac surgery .

Methodology: This retrospective cross sectional descriptive study was conducted in Department of Paediatric Cardiac Surgery at National Institute of Cardiovascular Diseases (NICVD), Karachi, Pakistan from October 2013 till September 2015. Patients up to age group of 14 years admitted for cardiac surgery at Paediatric Cardiac Surgery at National Institute of Cardiovascular Diseases (NICVD) were included.

Results: Out of 1004 patients, there were 683 males (68%). Patients presented with cyanotic heart disease were 578(57.5%) while acynotic patients were 426 (42.4%). Tetralogy of Fallot (TOF) followed by Ventricular Septal Defect (VSD) were the commonest congenital heart lesions, 42.8% and 20% respectively.

Conclusion: Majority of patients with paediatric heart disease had cyanotic CHD with the commonest lesion being Tetralogy Of Fallot (TOF) . Most of the patients were more than one year (70%) with significant difference in sex distribution with male predominance .

Key Words: Congenital Heart Disease, Cyanotic and Acyanotic Heart Disease, Ventricular Septal Defect, Tetralogy of Fallot

INTRODUCTION

Congenital Heart diseases is an important cause of morbidity and mortality in paediatric as well as adult population. Even after intervention many paediatric patients have to take burden of residual cardiac compromise throughout their life. Congenital heart disease by definition is the structural or functional heart disease, present at birth, even if, it is detected later on. Congenital heart disease is the commonest of all congenital lesions. Prevalence of congenital heart diseases is about 3.7 to 17.5 per 1000 live births.[1] Regarding the statistics 11% Pakistani children die due to cardiac anomalies during first month of life.[2] Hassan et al reported prevalence of congenital heart disease rate up to 4/1000 live births in Karachi.[3] However this study was conducted in a tertiary care private hospital while in Pakistan majority of births take place at home in rural areas and so true birth prevalence of congenital heart disease cannot be possibly calculated. Regarding the clinical presentation of congenital heart disease, it can be very variable; they may be asymptomatic and discovered only accidentally by a murmur noted during routine checkup or may present with symptoms like cyanosis, clubbing of nails to full blown congestive heart failure.

In addition to congenital heart disease many children present with acquired heart diseases for surgery like rheumatic heart diseases. Aortic dissection and infective endocarditis as well as cardiac tumors.

There are few studies conducted in Pakistan with bulk of those involve pediatric cardiac conditions managed in pediatric cardiology.

The aim of this study was to determine the burden of pediatric heart diseases requiring surgical intervention weather palliative or definitive.

METHODOLOGY

This cross sectional study was performed at Pediatric Cardiac Surgery Department of National Institute of Cardiovascular Disease Karachi (NICVD). NICVD is a major tertiary care hospital with state of art facilities for management of adult as well as pediatric cardiac diseases . We have a very healthy flow of patients from all over Pakistan. We receive patients from lower to upper middle class strata.

We retrospectively analyzed the records of all patients operated in our department of paediatric cardiac surgery form October 2013 to September 2015. Depending on diagnosis of condition and co morbid status a joint decision between pediatric cardiologist and surgeon was made regarding choice of intervention. Where ever it was possible definitive intervention was carried out. Common palliative procedures included MBT shunt or Glenn shunt to enhance pulmonary blood flow and PA banding to restrict pulmonary over circulation were carried out.

Cross sectional analysis of data done with categorical data was presented as percentage. All data was analyzed in SPSS 16.

RESULTS

Over the period of 24 months we had operated 1004 patients. This figure included 507(50.4%) open heart surgeries and 497(49.6%) close heart surgeries. Demographic characters of patients are shown in table 1.

Patients presented with cyanotic heart disease were 578(57.5%) while acynotic patients were 426 (42.4%). Spectrum of cyanotic heart diseases with performed intervention and mortality is shown in table 2. Tetralogy of fallot was most prevalent cyanotic heart disease as well as of all congenital heart diseases conditions requiring intervention with estimated prevalence of 42%. Other cyanotic heart disease with prevalence of 7% is TGA . While VSD was the most prevalent acynotic heart disease and second most common condition requiring intervention as shown in table 2.

Total definitive procedure consisted of 636(63.3%) and palliative procedures were 368(36.6%).

DISCUSSION

Pediatric cardiac surgery commonly deals with congenital heart defect either resulting pulmonary over circulation or under circulation. Some may have restriction of forward flow. Asian population is found to be have greater burden than non Asian race.[4] Pakistan being a developing country, we also deal some acquired conditions like rheumatic heart disease. Moreover due to limited number of centers dealing with cardiac defect, either these patients demise without getting medical help or present later on often inoperable . Pediatric Cardiac Defects are grossly divided into acyanotic and cyanotic cardiac lesions.[5] There were 1004 cases admitted for pediatric cardiac surgery with male to female ratio is 1.2:1. Same correlation was reported by Rahimtola.[6] There was higher number of male in both cyanotic and

Table 1: Demographic Characters of Study Population

Variables	n (%)
Female	321 (32%)
Male	683 (68%)
Children	708 (70.3%)
Age range	6 months - 1 year
Neonate	47 (4.7%)
Infant	249(24.8%)

Table 2: Spectrum of Heart Diseases with Types of Intervention and Outcomes

Spectrum of heart disease	n (%)	Definitive Intervention n	Palliative Intervention n	Mortality n (%)
Tetralogy of fallot	435(42.3%)	276	159	24(5.5%)
VSD	215(20.9%)	129	86	16(7.4%)
ASD	58(5.6%)	58		1(1.7%
TGA	78(7.6%	22	56	27(34.6%
Tricuspid atresia	38(3.7%)	6	32	3(7.8%
Mitral valve replacement	7(.6%)	7		0
DVR	2(.1%)	2		1(50%
VSD + AR	1(.09%)	1		0
Complete AV canal defect	33(3.2%)	2	31	3(9%
Tuncus arterious	4(.38)		4	2(50%
PDA	64(6.2)	64		2(3.1%
Congenital heart block (PPM insertion)	34(3.3%)	34		0
Coarctation of aorta	23(2.2%)	23		0
TAPVR	2(.19%)	2		0
PAPVR	5(.4%)	5		0
Dissecting aortic aneurysm	1(.09%)	1		1
Single atrium	1(.09%)	1		1
Pericardial effusion	1(.09%)	1		0
M.com	2(.19%)	2		0
Total	1004 (100%)	636	368	81(8%)

acyanotic heart lesions with more , complex heart defects and mixed cardiac lesions like transposition of great arteries ,tricuspid atresia ,partial and complete anomalous pulmonary venous return ,than females. This trend was coinciding by many other studies.[7,8] Nevertheless this trend was challenged by presenting increase female presentation with congenital heart defect, or no difference between sexes were observed.[9,10] In our study most common cardiac lesion was Tetralogy of Fallot, a cyanotic heart lesion with prevalence of 42.3%. This contradicts other studies conducted in our region. Najaf Masood et al reported prevalence of ventricular septal defect with 33% followed by Tetralogy of Fallot 17 %.[8] This observation was also supported by other studies from Pakistan and internationally.[11-14] Majority of our patients presented beyond 1 year of age. This may represent failure of large number of population to report due to lack of awareness, cost issue as well as remote health care facility as well as long waiting list . Single case of dissecting aneurysm reported in our study was a post PDA ligation .

A comparison of prevalence of pattern of congenital heart disease in our study with some other studies is shown in table 3

LIMITATION

Being a retrospective review with its inherent limitation of missing data is primary limitation of study . It include only patients requiring surgical intervention.

Table 3: Comparison of Frequency of Various Congenital Heart Diseases in Pakistan by Different Studies

Diagnosis	Present Study	Nadia Mohammada,[15]	Najaf Masood[8]	Syed Faiz-ul-Hassan Rizvi[16]	Sadiq m[17]
TOF	42.3%	11.2%	17.7%		16.1%
VSD	20.9%	29.9%	32.32%	40%	32.1%
ASD	5.6%	25%	14.6%	30%	13.2%
TGA	7.6%	5.2%	12.5%		
TA	3.7%				
PDA	6.2%	6%	3.6%		12.8%
CAVCD	3.2%	3%	2.1%	10%	

TOF (Tetralogy of fallot), VSD (Ventricular Septal Dfect), ASD (Atrial Septal Defect), TGA (Transposition of Great Vessels), TA (Tricuspid Atresia), PDA (Persistent Ductus Arteriousis), CAVSD (Complete Aterioventricular Canal Defect)

CONCULSION

The study gives an overview of the pattern of congenital heart disease in children admitted for cardiac surgery at Paediatric Cardiac Surgery NICVD. Interestingly our study showed higher prevalence of cyanotic heart diseases . Tetralogy Of Fallot is the leading congenital heart disease requiring intervention followed by Ventricular Septal Defect .

REFERENCES

1. Bolisetty S, Daftary A, Ewald D, Knight B, Wheaton G. Congenital heart defects in Central Australia. Med J Aust 2004;180:614-7.
2. Khan MS, Hussain I, Kazmi NR, Majid A, Javaid A. Morbidity and mortality in children in rural community of district Peshawar. Gomal J Med Sci 2009;7:31-4.
3. Hassan I, Haleem AA, Bhutta ZA. Profile and risk factors for congenital heart disease. J Pak Med Assoc 1997;47:78-81.
4. Stümper O, Wright JG, De Giovanni JV, Billingham C, Silove ED. Influence of ethnic origin on the pattern of congenital heart defects in the first year of life. Br Heart J 1995;73:173-6.
5. Berstein D. Epidemiology and genetic basis of congenital heart disease prevalence. In: Kliegman RM, Behrman RE, Jenson HB, Stanton BF, Zitelli BJ, Davis HW. Nelson textbook of pediatrics. 18th ed. Philadelphia: Saunder; 2007:1878-81.
6. Rahimoola RJ, Majid I, Shaqat SH. Congenital heart disease in children visiting JMPC. Pak Heart J 1980;13:21-9.
7. Rahim F, Younas M, Gandapur AJ, Talat A. Pattern of congenital heart diseases in children at tertiary care center in Peshawar. Pak J Med Sci 2003;19:19-22.
8. Masood N, Sharif M, Asghar RM, Qamar M, Hussain I.

Frequency of congenital heart diseases at Benazir Bhutto Hospital Rawalpindi. Ann Pak Inst Med Sci 2010;6:120-3.

9. Robida A, Folger GM, Hajar HA. Incidence of congenital heart disease in Qatari children. Int J Cardiol 1997;60:19-22.
10. Jaiyesimi F, Ruberu DK, Misra VK. Pattern of congenital heart disease in King Fahd Specialist Hospital, Buraidah. Ann Saudi Med 1993;13:407-11.
11. Malik S, Majeed R, Channer MS, Saleem MI. Frequency of cardiac defects among children at echocardiography centre in a teaching hospital. Pak J Med Sci 2009;25:712-7.
12. Akhtar K, Ahmed W. Profile of congenital heart disease and correlation to risk adjustment for surgery: an echocardiographic study. J Coll Physicians Surg Pak 2008;18:334-7.
13. Tefuarani N, Hawker R, Vince J, Sleigh A, Williams G. Congenital heart disease in Papua New Guinean children. Ann Trop Paediatr 2001;21:285-92.
14. Miyague NI, Cardoso SM, Meyer F, Ultramari FT, Araújo FH, Rozkowisk I, et al. Epidemiological study of congenital heart defects in children and adolescents. Analysis of 4,538 cases. Arq Bras Cardiol 2003;80:269-78.
15. Mohammad N, Shaikh S, Memon S, Das H. Spectrum of heart disease in children under 5 years of age at Liaquat University Hospital, Hyderabad, Pakistan. Indian Heart J 2014;l66:145-9.
16. Rizvi SF, Mustafa G, Kundi A, Khan MA. Prevalence of congenital heart disease in rural communities of Pakistan. J Ayub Med Coll Abbottabad 2015;27:124-7.
17. Sadiq M, Roshan B, Khan Latif f, Basher I. Sheikh S. Pattern of paediatric heart disease in Pakistan. J Coll Physicians Surg Pak 2002;12:149-53.