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Original Article

A PREVALENCE STUDY OF CONGENITAL HEART DISEASE IN NWFP, PAKISTAN

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ABSTRACT:

Objective: To assess the frequency of congenital heart disease in patient referred for the echocardiography.

Design: This echocardiographic study focused on findings of congenital heart disease in unselected subjects referred for echocardiography.

Setting: This study was conducted in a private cardiac diagnostic facility in Peshawar, NWFP, Pakistan between July 2000 to June 2001.

Patients and Method: Patients referred for echocardiography were studied. Standard echocardiographic 2 doppler studies were done on all cases while TEE was not used in any case.

Results: Twenty three hundred and seventy four patients were studied in 12 months period. Three hundred and ninety eight cases of congenital heart disease were found, forming 16.76% of total VSD 45, ASD 14, PS 14, TOF 9.5 and PDA were found in 9.7 percent cases respectively.

Conclusion: Congenital heart disease contributes significantly to the overall burden of cardiovascular diseases.

KEY WORDS: Congenital Heart Disease, Electrocardiography, NWFP, Pakistan

INTRODUCTION

Congenital cardiovascular disease is defined as an abnormality in the cardiocirculatory structure or function that is present at birth. This may influence the dynamics of rest of the circulatory system significantly over a period of time.[1] It is seen in 8% of live birth while the incidence in the stillborn babies is ten times higher.

The prevalence of congenital heart disease is likely to be underestimated because of trend towards home deliveries and brief stay of neonate in the hospital in case of hospital deliveries. Most cases are detected upon referral for cyanosis, clubbing or cardiac murmur. The number of patients with congenital heart disease is on increase because of steady addition and increased longevity.[2]

Despite improved medical care, congenital heart disease remains a leading cause of neonatal and infant mortality.[3] This one year prospective observational study of 398 patients of congenital heart disease highlights its presence in NWFP.

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PATIENTS AND METHOD

This is a prospective observational study of 398 cases of congenital heart disease examined and evaluated echocardiographically in twelve months between July 2000 to June 2001, in a cardiac diagnostic facility in the private sector in Peshawar, NWFP. We received 2374 patients for echocardiography during this period, from all over the NWFP.

The patient's age, gender and address was noted. Clinical examination was done for cyanosis, clubbing and cardiac evaluation. The electrocardiograph and chest radiograph of the patients was evaluated for clinical correlation. Echocardiography was done by the Toshiba color Doppler ultrasound (SS-A 270 A). Standard M-mode and 2 D examination was followed by Doppler examination. TEE was not used in any of the patients. The diagnosis was reviewed on spot by second physician for opinion, confirmation and clinical correlation. The following end points were noted:

1. Number of cases with congenital heart disease.
2. Type of congenital heart disease.
3. Cases operated for congenital heart diseases.

Male and females of any age were considered. Cases with features of rheumatic heart disease and other acquired heart disease including mitral valve prolapse were excluded from this study. Clearly defined and unambiguous cases with congenital heart disease were included.

RESULTS

A total of 2374 cases were studied over a period of twelve months. Three hundred and eighty nine cases of congenital heart disease were found. Of these 249 were males and 149 were females. Mean age was 11.9±4. The description of the individual type of the lesion and their percentage is shown in Table-I.

DISCUSSION

Congenital heart defects is an important group of disease which steadily adds to the overall burden of cardiac ailments. VSD, ASD PDA,

Table - I: Types of lesions

(n=389)

Lesion	*Number/total*	*Percentage (%)*
VSD	180/398	42.22%
ASD	56/398	14.08%
TOF	38/398	9.54%
PDA	39/398	9.79%
Pulmonic stenosis	28/398	7.0%
Bicuspid aortic valve	13/398	3.26%
Transposition of great vessels	21/398	5.27%
Double outlet right ventricle	11/398	2.76%
Complete A/V canal defect	9/398	2.26%
Dextrocardia	5/398	1.25%
Ebstein anomaly	2/398	
Tricuspid atresia	1/398	
Truncus arteriosis	1/398	0.25%
Cor triatriatum	1/398	0.25%
Operated cases	2/398	0.5%
TOTAL	389	

Fallots tetralogy and pulmonic stenosis are among the major congenital heart diseases afflicting our younger population. Innovation of cardiac surgical procedures as well as advancement in the medical treatment has increased the survival of such children into adolescence.

There are very few local studies and reports about the prevalence of congenital heart disease. Dr. Shafqat and colleagues[4] conducted an observation study based on 230 patients suspected of congenital heart disease of which only 200 patients had proven congenital heart disease. In this study Ventricular Septal Defect (VSD) was the commonest lesion seen in 42 (21%) patients. Male to female ratio was 9:5 and their age ranged between one month and twenty-five years with a mean age of 5.6 years. Atrial Septal Defect (ASD) was seen in 32 (16%) of patients in this series. Male to female ratio was surprisingly 9:7 and the mean age being 16.5 years. Patent ducts arterious (PDA) were seen in 24 (12%) patients. Male to female ratio was 1:2 and the mean age was 6.5 years. Fallot's tetrology was seen in 33 (16.5%) cases. Male to female ratio was 7:4 and the mean age was 8.2 years. Pulmonary stenosis accounted for 31 (15.5%) cases. Male to female ratio was 1.6:1 and the mean age was 9.6 years. Majority of the patients in Fallot's tetrology as well as pulmonary stenosis were less than ten years of age. Other defects they noted included transposition of the great vessels, tricuspid artesia, ASD with pulmonary stenosis persistent truncus arterious and Eisenmenger's syndrome etc.

In another study Dr. Razia Rahimtoola and her colleagues[5] studied 190 cases of congenital heart disease at children Unit-I at JPMC from July 1968 to June 1974. It was purely a clinical study and no autopsies were performed. Total admissions during this period were 7,480 of which 190 (2.5%) patients had congenital heart disease. Of these approximately 69% were acyanotic and potentially cyanotic while 31% were of the cyanotic group. There was preponderance of males over female, 109 (57.3%) male to 81 (42.7%) female. The incidence of first cousin marriages was very high i.e. 71.2% as compared to about 45% in the general population. A positive correlation has been reported between advanced maternal age and incidence of congenital heart disease but this was not found in our study. In this series VSD accounted for 75 (39.46%), PDA 23 (12.10%) and ASD 16 (7.9%) whereas Fallot's tetrology was seen in 28 (14.73%) of cases. VSD was the most common defect encountered while Fallot's tetrology, PDA and ASD all combined made up to the 8-15% of the total number of patients with congenital heart defects. A comparison of the above two studies with this study is given in Table-II.

The relevant frequency of the major congenital heart diseases in our study is at variance with the internationally reported figures.[6] For example the frequency of VSD 25%, ASD 6%, PDA 6% and Tetrology of Fallot 5% are reported in the international literature whereas our comparative figures are VSD 42.2%, ASD 14%, PDA 9% and Tetrology of Fallot 9%. The paucity of operated congenital heart cases in our study reflects the scarcity of cardiac surgical facilities in NWFP. However as compared with the earlier two studies by Shafqat et al.[4] and

Table - II: Comparative study of lesions in various studies

	Shafqat et al	*Rahimtoola et al.*	*Present study*
Total No. of Patients	200	190	398
Ventricular Septal Defect	42 (21%)	75 (39.46%)	180 (42.2%)
Atrial Septal Defect	32 (16%)	16 (7.90%)	56 (14.08%)
Patent Ducts Arterious	24 (12%)	23 (12.10%)	39 (9.79%)
Pulmonary stenosis	31 (15.5%)	1 (0.52%)	28 (7%)
Fallot's Tetrology	33 (16.5%)	28 (14.73)	38 (9.54%)

Rahimtoola et al.[5] Ventricular Septal Defect is the most commonest lesions in all these three studies, followed by ASD, PDA and Tetrology of Fallot.

The multifactorial etiology of congenital heart disease involves the chromosomal abnormality of the fetus, maternal diabetes, systemic lupus erythematosis, alcohol intake, smoking, fetal and maternal exposure to radiations and teratogenic drugs and maternal rubella infection during early pregnancy.[6]

The initial evaluation of congenital heart disease involves search for cyanosis, clubbing, cardiac murmurs and examination of the ECG and chest radiograph. The echocardiographic examination settles the diagnosis in majority of cases.[7]

The complications of congenital heart diseases include failure to thrive, repeated chest infections, polycythemia, CNS abscess, thromboembolism, stroke, gout, pulmonary hypertension and CCF.[6]

Over attention towards mild lesions like bicuspid aortic valve, or mitral valve prolapse may cause undue anxiety and disability. Prophylaxis against infective endocarditis may be observed where necessary. Polycythemia and anaemia may be avoided. Patients with mild disease or those who have had corrective surgery have normal course of pregnancy. Females with cyanotic congenital heart disease or severe congenital heart disease may be offered contraceptive advice.[7] Appropriate corrective or palliative cardiac surgery is offered to the patients where it is indicated.[7]

Genetic counseling should be offered to the patients with history of congenital heart disease in the family. Apart from single gene mutation, the multifactorial nature of inheritance of congenital heart disease result in low risk of recurrence. The incidence is increased by three to seven times for the second pregnancy following the birth of the affected child or if the parent is affected.

The adage of prevention better than cure is best applied to congenital heart lesion. Good antenatal care is a cost effective approach. The preventive strategies are impeded by the obscurity of the cause of congenital heart disease in most of the cases. Avoidance of drugs during the first trimester of pregnancy is a good principle to follow. Fetal and gonadal radiation exposure must be avoided. Rubella vaccination must be offered to all during the childhood.[10] Attendants providing antenatal care should be imparted proper training. Fetal amniocentesis can provide antenatal diagnosis in cases of chromosomal abnormalities. Fetal echocardiography can detect fetal cardiac defects in the antenatal period.

The impact of preventive strategies for reduction congenital heart disease and maternal mortality will be greater if the physicians/obstetricians personally implement the proven recommendations for standard antenatal care in their locality.

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