Pattern of Congenital Heart Disease in Jordan

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ABSTRACT

Aim: *Congenital heart disease is the most common congenital problem in children. Presentation can vary from asymptomatic accidental finding to severe cardiac decompensation and death. Early recognition has great implications on prognosis. To study age, gender distribution and frequency of congenital heart disease in children referred to echocardiography in a single hospital in Zarqa.*

Methods: *This is a retrospective descriptive study on all patients with the confirmed diagnosis of congenital heart disease referred for echocardiography over a period of two years from October 2005 to October 2007. Patients from day one of life till 14 years were included. Study was conducted in the pediatric cardiology clinic at Prince Hashem Hospital in Zerqa .*

Results: *A total of (173) children were included. There were (95) males (54.9%) and 78 females (45.1%) with a ratio of 1.2:1. Seventy four percent of the children had acyanotic cardiac lesions. Ventricular septal defect followed by atrial septal defect, patent ductus arteriosus, and pulmonary valve stenosis were the most common acyanotic congenital heart lesions. Whereas Tetralogy of Fallot (TOF) followed by transposition of the great arteries were the commonest cyanotic congenital heart lesions. There was a female dominance in PDA and A-V canal lesions heart defects (63% and 68% respectively). While more males had aortic valve defects.*

Conclusion: *Majority of patients with CHD detected have non-cyanotic CHD. TOF is the commonest cyanotic lesion and VSD non-cyanotic lesion. In order to avoid complications, early detection of congenital heart disease is of utmost importance for proper management. 2D-echo with Doppler examination forms the gold standard for diagnosis.*

Key words: *Congenital heart disease, 2-dimention echocardiography, ventricular septal defect, patent ductus arteriosus.*

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INTRODUCTION

Congenital heart disease (CHD) is the most common congenital problem in children accounting for nearly 25% of all congenital malformations (1). Early recognition of such diseases has great implications. Clinical presentation and deterioration may be sudden and can lead to death. Despite improved medical care CHD is considered one of the leading causes of neonatal mortality (2).

CHD may present in different ages from birth to adolescent age group (2). Most cases are asymptomatic and discovered during routine neonatal check ups (3). Other presentations can range from cyanosis, clubbing of fingers to full blown congestive heart failure (2,3).

CHD has not been studied thoroughly in Jordan as in other western and neighboring countries.

The purpose of this study is to present a single center experience in congenital heart disease at Prince Hashem Hospital in Zarqa and compare it to other countries.

MATERIAL and METHODS

This is a retrospective chart review conducted in Pediatric echo-cardiac clinic from October, 2005 to October, 2007 in Prince Hashem hospital in Zarka/ Jordan. All children with the confirmed diagnosis of congenital heart disease were included. CHD is defined as the structural heart disease or intrathoracic great vessels that is actually or potentially of functional significance present at the time of birth even if there was a delay in detection, as defined by Mitchell et al. (4) One hundred and seventy three children were studied. Age ranged from day1 till 14 years of age.

Clinical data were reviewed. Consideration was given to total number of cases with CHD, age at diagnosis, sex distribution and type of CHD.

Patients with multiple congenital anomalies or syndromes were excluded. Premature babies were also excluded. Patients with acquired heart diseases as rheumatic heart or mitral valve prolapse were not included as well.

RESULTS

A total of (173) child was included. There were (95) males (54.9%) and 78 were females (45.1%) ,with a male: female ratio of 1.2 :1. One hundred and twenty seven children (74%) the total cases had acyanotic cardiac defects. Cyanotic heart defects were seen in 126 patients (26%). Ventricular septal defect followed by trial septal defect, patent ductus arteriosus, and pulmonary valve stenosis were the commonest acyanotic congenital heart lesion, 43.4%, 13.6%, 8.3%, 6.2% respectively. Whereas Tetralogy of fallot (9.5%) followed by transposition of the great arteries (5.5%) and tricuspid atresia (3.6%) were the commonest cyanotic congenital heart lesions as shown in (Table 1).

Figure 1 compares acyanotic and acyanotic congenital heart diseases. Female dominance of PDA and A-V canal lesions 63% and 68% of cases respectively were seen. Whereas a male dominance in the aortic valve lesions was seen.

DISCUSSION

Congenital heart diseases are an important group of diseases that cause great morbidity & mortality in children (5). Our aim was to show our experience and compare it to others. This study does not

Table 1. *Relative distribution of cyanotic and non-cyanotic CHD lesions.*

Cardiac lesions	*Number*	*Percentage*
Ventricular Septal Defect	*75*	*43.4%*
Atrial septal defect	*22*	*13.6%*
Patent Ductus arteriosus	*14*	*8.3%*
Pulmonary valve stenosis	*10*	*6.2%*
Aortic valve stenosis	*6*	*4.3%*
Tetralogy of Fallot	*16*	*9.5%*
Transposition of great arteries	*9*	*5.5%*
Complex CHD	*4*	*2.25*
Tricuspid Atresia	*6*	*3.65*
Complete atrio-ventricular septal defect	*6*	*3.6%*
Coarctation of aorta	*5*	*3.4%*

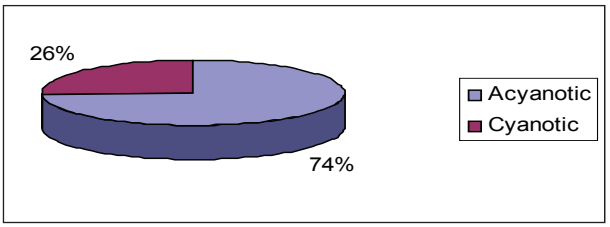

***Figure 1**. Type of Congenital heart disease.*

give true incidence and prevalence of CHD in total population since it is confined to Prince Hashem hospital only, and this needs to be done on a larger scale. It is generally accepted that the improvement of diagnosis, attention or awareness among general pediatrician and early referral to pediatric cardiologists has resulted in an increase of reported prevalence of CHD (2,5).

The present study indicates that CHD is an important pediatric cardiac problem in our study group. To the best of our knowledge there are no other local studies and reports about cases of CHD at Al – Zarqa governate. There were (173) cases, 95 were male (54.9 %) of CHD and 78 (45.1%) females, Male to female ratio is 1.2:1. This is slightly higher than that shown by other studies of equal frequency (6).

Seventy four percent of cases were acyanotic CHD and the remaining was cyanotic. This well correlated with international studies. It is inevitably that some cases would have escaped detection and referral which mainly includes neonates, born at home or who die without medical attention.

VSD is found to be the most common acyanotic CHD (43.4%) in our study. This is higher than what is reported in other studies as shown in Table 2 (7,8). Worldwide, VSD is the most common acyanotic CHD accounting for 25-30% of all CHD (9). This may be explained by the difference in genetic make up and ethnicity.

ASD ranked second in frequency accounting for 13.6%. Other studies have shown comparable results Table 2.

PDA was seen in 8.3% of cases. This is lower than that reported in Saudi Arabia and Denmark 10.4% and 12.5% respectively (7,10). The difference can be explained by the exclusion of all premature babies in our study.

***Table 2**. Comparative study of lesions with other studies.*

Types of CHD	*Prince Hashem Hospital*	*Fuad Abbag (Saudi Arabia)*	*Alberta Hertiage pediatric cardiology programe (Canada)*	*Mary K.M.Shann (Taiwan)*
Ventricular Septal Defect	*43.4%*	*32.5%*	*34.4%*	*39.3%*
Atrial septal defect	*13.6%*	*10.4%*	*10.5%*	*5.3%*
Patent Ductus arteriosus	*8.3%*	*15.8%*	*10.8%*	*9.8%*
Pulmonary valve stenosis	*6.2%*	*10.1%*	-	*2.5%*
Aortic valve stenosis	*4.3%*	*2.7%*	-	-
Tetralogy of Fallot	*9.5%*	*4.5%*	*10.2%*	*12.3%*
Transposition of great arteries	*5.5%*	*1.5%*	*5.1%*	*5.3%*
Complex CHD	*2.25%*	*2.7%*	*3.5%*	*5.0%*
Tricuspid Atresia	*3.65%*	*1.5%*	-	-
Complete atrio-ventricular septal defect	*3.6%*	-	*4.4%*	-
Coarctation of aorta	*3.4%*	*3.3%*	-	*1.1%*

There is a significant difference in the incidence of Coarctation of the aorta in developing countries as compared to that of developed countries (11,12). It is reported to be 3.4%, 3.3% and 1.1% in our study, Saudi Arabia and Taiwan respectively, as compared to 10.2% in Sweden (14). Shehan M from Taiwan suggested a probable explanation related to certain vitamin deficiencies in diet (8). We believe it might also be related to the later diagnosis of this entity in late adolescence which is an age group not included in our study.

Among the cyanotic lesion Tetralogy of Fallot was the commonest cyanotic congenital heart followed by transposition of the great arteries being 9.5% and 5.5% respectively. This is comparable to world wide incidences (5-7%) (7-9).

There was a female predominance in PDA and AV canal defect in 63% and 68% respectively in our study. This is consistent with that reported by Kenna in Liverpool15. Male predominance was seen in pulmonary stenosis. This is similar to that found in Alexandria, Egypt16. But contrasts other studies in United Kingdom and Saudi Arabia that have shown male predominance in aortic valve diseases and coarctation of the aorta (7,15).

The multifactorial etiology of CHD involves the chromosomal abnormality, maternal diabetes, smoking, teratogenic drug and maternal infection during early pregnancy (9,17) . These most likely can explain the difference in reported incidences in different countries.

CHD have a multifactorial nature of inheritance (17). This emphasizes the importance of genetic counseling to patients with family history of congenital heart diseases (17,18).

Our study should be a base for a national Pediatric cardiac database we recommend the continuity of statistical studies in all Jordanian hospitals. Echocardiography is considered gold standard for diagnosis of congenital heart disease. Early referral children with suspicion CHD to nearest Pediatric cardiac center for early treatment to improve the outcome.

In conclusion, this study gives only an overview of the pattern of congenital heart disease at Prince Hashim Military Hospital.

Majority of patients with congenital heart disease detected have non-cyanotic CHD. TOF is the commonest cyanotic lesion and VSD non-cyanotic lesion. In order to avoid complications early detection of congenital heart disease is of utmost importance for proper management.

2D-echo with Doppler examination forms the gold standard for diagnosis.

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