Patterns of Congenital Heart Disease in Northern Jordan

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Abstract

Objective: To study the pattern of Congenital Heart Diseases (CHD) of the children who are referred to one of the main referral hospitals (Princess Rahmah Teaching Hospital for Children) in the north of Jordan.

Methods: A prospective study of all the children referred to the Echocardiography clinic because of suspected heart problems. Cases of congenital heart disease were identified and analyzed to verify the pattern in Northern Jordan over a two-year period; starting on January 2000.

Results: Of the 1038 case suspected clinically to have heart diseases, 455 (44%) heart defects were identified by Echocardiography (Echo) in 399 children. Ventricular Septal Defect (VSD), being the commonest, was noticed in 189 (41%), followed by Pulmonary Stenosis (PS), that was noticed in 93 (20%) of the cases. The overall female to male sex ratio was 1.25:1.0. The sex distribution for VSD was 60% for female versus 40% for male. There is no sex difference among children with pulmonary stenosis. Female predominance was also noticed in Atrial Septal Defect (ASD) and Patent Ductus Arteriosus (PDA) by 64% for each defect. One third of the patients with congenital heart diseases were diagnosed by the age of three months.

Conclusion: This is the first study on congenital heart diseases in Northern Jordan. It shows that VSD is the commonest; being similar in this respect to the previous reports elsewhere, but have an unexplained higher incidence of PS.

Keywords: Congenital Heart Disease, Northern Jordan, Ventricular Septal Defect, Pulmonary Stenosis, Patent Ductus Arteriosus.

(J Med J 2006; Vol. 40 (4): 262- 265)

Received	*Accepted*
July 9, 2006	*September 5, 2006*

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Introduction

Several reports suggest that the incidence and the pattern of congenital heart diseases (CHD) may vary in different geographical locations. [1-5]

A seasonal influence on the incidence of certain defects has also been demonstrated. [6] These variations may be attributed to environmental factors. [7-10] Therefore, continuous studies on various aspects of CHD in different communities and races are recommended. We, here, present the first study on CHD in Northern Jordan, to provide an overview on the pattern of CHD in this area and to compare our results with other regional and international studies.

Methods

Irbid is the main city in the north of Jordan with an estimated population of one million. Princess Rahmah Teaching Hospital for Children (PRTH) is one of the main teaching and referral pediatric hospital in Northern Jordan serving children below the age of fourteen. The hospital receives patients with known or suspected heart diseases from all over the northern area. Over two years between January 2000 and December 2001, 1038 cases were referred to the Echocardiography clinic for Echocardiographic diagnosis because of suspected heart diseases. Infants and children found to have CHD by echocardiography were studied. A data collection sheet was structured for the sake of the study, which includes information on the demographic characteristics, age at diagnosis and the final diagnosis. A verbal consent was taken from all participants and the study was approved by the ethical committee of PRTH. The diagnosis of CHD in each patient was based on clinical findings and the following investigations: Chest X-ray, ECG and Echocardiography (with 2D, M-mode and Doppler). Few patients were referred to King Hussein Cardiac Centre for catheterization, final diagnosis and/or urgent surgical intervention. Data were entered into the PC and a simple statistical analysis was processed.

Results

During the two-year period, 1038 patients were referred because of suspected heart diseases, 455 heart defects among them were identified in 399 children. Single defects were identified in 351 (88%), while the remaining (12%) had more than one defect. The various cardiac defects recognized in the patients are detailed in table (1), with VSD being the commonest; (41%), followed by PS; (20%).

Table (1) lists the percentage of heart defects, and also compares our data to similar data from America, Europe, Ethiopia, Japan, Saudi Arabia and India. The cumulative percentage is more than 100% due to the combined heart lesion.

Table (2) shows the relation between the cardiac defect and the age of the patient by the time of diagnosis. Fifty-four (33.6%) patients of all the CHD cases were diagnosed by the age of three months. Cyanotic CHD accounted 4% of the total CHD. The overall female to male sex distribution was 1.25:1.0. Female predominance was seen in VSD, ASD and PDA. No sex difference was noticed in PS.

Discussion

Despite the opinion of some cardiologists that there was no difference in the incidence or the prevalence and pattern of CHD throughout the world, [11] a regional variation in the prevalence of CHD has been reported. [5,10,12,13] VSD was the most common heart defect seen in 189(41%) of our series (Table 1). This figure is nearly similar to that from Saudi Arabia. [4] The mean prevalence rate of VSD has been reported to be between 30% in Europe/USA series [12] and 60% in that from Japan. [10] PS was seen in 93 (20%) from our patients, which is nearly twice as common as that from Japan and Saudi Arabia (Table 1). The reason for high incidence of PS in this series is obscure. Although other congenital defects showed a different variation in different parts of the world, our data were consistent with those reports form the same region. [4]

Table 1: Relative prevalence of various cardiac defects in different countries.

Defect	*Europe/ USA*	*Ethiopia*	*Japan*	*Saudi Arabia*	*India*	*Jordan*
VSD	*30.3*	*38.1*	*60*	*38.5*	*37*	*41*
ASD	*6.7*	*10.2*	*5.3*	*11.5*	*12*	*15*
PS	*7.4*	*7.4*	*9.6*	*9*	*3*	*20*
PDA	*8.6*	*18.8*	*3.6*	*8*	*5*	*11*
FT	*5.1*	*8.0*	*5.8*	*4.5*	*17*	*4*
TAPVR	*NA*	*7.4*	*1.8*	*5.0*	*NA*	*2*
TGA	*4.7*	*2.8*	*2.2*	*4.5*	*5*	*0.5*
AS	*5.2*	*2.8*	*1*	*3*	*NA*	*5*
COARC	*5.7*	*1.1*	*2.7*	*2*	*NA*	*1*
Others	*26.3*	*3.4*	*9.5*	*14.5*	*NA*	*12*

Table 2: Age at diagnosis of the common heart defects.

Age	*PDA*	*ASD*	*VSD*	*PS*	*Total (%)*
Less than 1- month	*16*	*16*	*38*	*15*	*80 (20)*
1-3 months	*7*	*14*	*27*	*12*	*54 (13.6)*
3-6 months	*7*	*5*	*26*	*13*	*44 (11)*
6-12 months	*2*	*6*	*25*	*15*	*49 (12.4)*
>12 months	*13*	*17*	*73*	*38*	*172 (43)*

The commonest cyanotic CHD was FT, as seen in 16 (4%) patients, nearly similar to Europe and USA series. [4] The least common cyanotic CHD was TGA (0.5%), a figure lower than that of other studies. This variation could be due to either a genetic or an environmental factor, such as the higher incidence of congenital infections and consanguineous marriages in some parts of the developing countries compared to the developed countries. [15] Combined heart lesions were seen in 48 (12%) patients. The commonest combined defect was ASD and VSD, seen in 16 children and constituting nearly one third of all combined lesions. For all the CHD in this series, there is a female predominance of 1.25:1.0. Although there is no clear sex predominance for PS, there is a female predominance for VSD, ASD and PDA. In other defects, no categorical statements regarding sex distribution could be made because of the small numbers. The age of detection of CHD also varies from one centre to the other. In the present study (Table 2), 57% of patients have been diagnosed in the first year of life, compared to 60% in Saudi series [4] and 82% in Black pool UK, [14] while only 16% were detected in the Ethiopian series. [5]

This variation in the age of diagnosis can be attributed to the improvement in maternal and neonatal care facilities as well as better baby welfare clinics.

Conclusion

This is the first report about CHD in northern Jordan. VSD is the most common CHD detected, a fact similar to previous reports, but unlike others, we also have a high incidence of ASD. To avoid complications of CHD in the future, improvements in the services is required for early detection of cardiac malformations.

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