

Pattern of Congenital Heart Disease in Northern Jordan●

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Objective: To study the pattern of congenital heart diseases in Northern Jordan.

Design: A prospective study of 170 children with congenital heart disease.

Setting: Princess Rahmah Teaching Children Hospital.

Subject: All cases of congenital heart diseases in Northern Jordan over two years period starting January 1994.

Result: A single heart defect was seen in 90 % of cases with Ventricular Septal Defect (VSD) being the commonest seen in 44 % followed by Atrial Septal Defect (ASD) in 13.5 %. Of the 10 % with combined or complex heart defects, a combined VSD and ASD were the commonest seen in six patients (35 %). The overall male to female sex ratio are 1.1:1.0. There is identical sex distribution for VSD. Male predominance is seen in pulmonary stenosis, aortic stenosis, atrioventricular canal defects and fallot tetralogy. Female predominance is seen in ASD, Patent Ductus Arteriosus and Transposition of Great Arteries. Half of the patients with congenital heart diseases are diagnosed by three months and three quarter by the age of six months.

Conclusion: This is the first study on congenital heart diseases in Northern Jordan that shows a VSD being the commonest, corroborating previous reports but have an unexplained higher incidence of ASD.

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Several reports suggest that the incidence and the pattern of congenital heart diseases (CHD) may vary in different geographical locations¹⁻⁵. A seasonal influence on the incidence of certain defects has also been demonstrated⁶. These variations may be attributed to either differences in genetic predisposition or environmental factors⁷⁻¹⁰. Therefore continuous studies on various aspects of CHD in different communities and races is recommended. We here present the first study of CHD in Northern Jordan to provide an overview on the pattern of CHD in this area and to compare our results with other studies.

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METHODS

Irbid is the main city in the north of Jordan with an estimated population of one million. Princess Rahmah Teaching Children Hospital is the main teaching and referral paediatric hospital in Northern Jordan serving children below the age of eighteen. The hospital receives patients with known or suspected heart diseases from all over the northern area. Between January 1994 and December 1995, 170 infants and children with CHD were prospectively studied in this hospital. 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 Hussain Cardiac Centre for catheterisation, final diagnosis and/or urgent surgical intervention.

RESULTS

During the two year period, 170 patients with CHD were studied. The various cardiac defects recognised in the patients are shown in table 1, with VSD being the commonest (44 %) followed by ASD in 13.5 %.

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

Defect	Europe/USA ¹³ (N=3104) (%)	Ethiopia ⁵ (N=168) (%)	Japan ¹⁰ (N=773) (%)	Saudi Arabia ¹ (N=320) (%)	Present Study (N=170)
Ventricular septal defect (VSD)	30.3	38.1	60	38.5	44.1
Atrial septal defect (ASD)	6.7	10.2	5.3	11.5	13.5
Pulmonary stenosis (PS)	7.4	7.4	9.6	9	6.5
Patent ductus arteriosus (PDA)	8.6	18.8	3.6	8	4.7
Fallot tetralogy(FT)	5.1	8.0	5.8	4.5	4.7
Atrioventricular canal defect (AVCD)	NS	7.4	1.8	5.0	4.7
Transposition of great arteries(TGA)	4.7	2.8	2.2	4.5	6.6
Aortic stenosis (AS)	5.2	2.8	1	3	4.7
Coarctation of aorta (COARC)	5.7	1.1	2.7	2	1.2
Others	26.3	3.4	9.5	14.5	10.0

NS = not stated

Table 1 also compares our data to that from America, Europe, Ethiopia, Japan and Saudi Arabia. Table 2 shows the combined and complex cardiac defects. Concomitant VSD and ASD were the commonest combined lesions seen in 6 %.

Table 2. Combined and complex defect

Defect	No
ASD + VSD	6
ASD + VSD + PDA	1
Common atrium (1 with dextrocardia)	4
Single ventricle	1
Hypoplastic left heart syndrome	1
ASD + PDA	1
ASD + PS	1
VSD + PS	1
MS + MR	1
Total	17

ASD - atrial septal defect, VSD ventricular septal defect, PDA - patent duetus arteriosus, PS- pulmonary stenosis, MS - mitral stenosis, MR - mitral regurge

Table 3. Age of detection

Age	PDA	ASD	VSD	AS	COARC	PS	FT	TGA	AVCD	Others	Total (%)
< 1 week	2	1	2	-	1	1	-	5	1	3	16(9.4)
1-4 weeks	-	1	5	-	-	-	2	2	2	4	16(9.4)
1-3 months	2	9	34	1	1	2	-	-	4	2	56(33)
3-6 months	1	7	1	8	3	2	3	-	1	2	37(21.8)
6-12 months	1	4	5	2	-	3	-	2	-	2	19(11.2)
> 12 months	2	1	11	2	-	3	-	-	-	4	26(15.3)

Table 3 shows the relation between the cardiac defect and the age of patient at the time of diagnosis. Sixteen (9.4 %) patients of all CHD were diagnosed at one week of age, 32 (18.8 %) by 4 weeks, 88 (51.8 %) by 3 months, 125 (73.6 %) by 6 months, 144 (85 %) by 12 months and only 26 (15 %) patients were diagnosed after the age of one year. Of the thirty patients who were with cyanotic heart disease, half were detected before the age of one month. The overall male to female sex distribution in relation to the type of defects were 1.1:1.0. Male predominance was seen in pulmonary stenosis (PS) with a ratio of 10:1, aortic stenosis (AS) 7:1, atrioventricular canal defects (AVCD) 7:1 and Fallot tetralogy (FT) 1.7:1. Female predominance was seen in transposition of great arteries (TGA) 4:1, patent ductus arteriosus (PDA) 3:1 and ASD 1.3:1. No sex difference was seen in VSD.

DISCUSSION

Despite the opinion by some cardiologist that there is no difference in the incidence, prevalence and pattern of CHD throughout the world¹¹, a regional variation in the prevalence of CHD have been reported^{5,10,12,13}. VSD was the most common single isolated defect seen in 75 (44 %) of our series (Table 1). This figure is nearly similar to that from Saudi Arabia⁴. The mean prevalence rate of VSD has been reported to be between 30 % in Europe/USA series¹² and 60 % to that from Japan¹⁰. ASD was seen in 23 (13.5 %) in our patients which is nearly twice as common as that in Europe/USA and Japan (Table 1). The reason for high incidence of ASD in this series is obscure. Although other congenital defects showed different variation in different parts of the world our data were consistent with those reports from the same region⁴. The commonest cyanotic CHD was TGA seen in 10 (6 %) patients, followed by FT in 8 (4.7 %) which is similar to the Saudi study⁴. The less common congenital CHD like aortic stenosis and coarctation of aorta were seen in 11 % of cases in Europe/USA study while seen only in 10 (6 %) of our patients. This variation could be due to either a genetic or environmental factors, such as the higher incidence of congenital infections and consanguineous marriages in some parts of the developing countries compared to the developed countries.

Combined heart lesions were seen in 17 (10 %) patients. The commonest combined defects was ASD and VSD (Table 2) constituting nearly one third of all combined lesions. For all the CHD in this series, there is slight male predominance of 1.1:1.0. There is no clear sex predominance for VSD, but there is a female predominance for ASD, PDA, TGA and a male predominance in PS, AS, AVCD and FT. In other defects, no categorical statement regarding sex distribution can be made because of small numbers. The age of detection of CHD also varies from one centre to the other. In the present study (table³) 85 % of patients have been diagnosed in the first year of life, compared to 60 % in Saudi series⁴ and 82 % in Black pool, UK¹⁴, while only 16 % were detected in the Ethiopian series⁵. This variation in the age of diagnosis can be attributed to the improvement in maternal and neonatal care facilities as well as better welfare baby clinics.

CONCLUSION

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

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CONCLUSION

This is the first report about CHD in Bahrain. VSD is the most common CHD detected. In previous reports, but not in this study, we have a high incidence of ASD. To avoid complications of CHD, future improvement in early detection of cardiac malformations is required.

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DISCUSSION

Despite the opinion by some cardiologists that there is no difference in the incidence prevalence and pattern of CHD throughout the world, a regional variation in the prevalence of CHD have been reported. VSD was the most common single isolated defect seen in 22 (44%) of our series (Table 1). This figure is nearly similar to that from Saudi Arabia. The most prevalence of VSD has been reported to be between 30% in Europe, USA series (2) and 40% to 50% in Saudi Arabia. ASD was seen in 17 (33%) in our patients which is nearly twice as common as that in Europe/USA and Japan (Table 1). The reason for high incidence of ASD in this series is not clear. Although other congenital defects showed different variation in different parts of the world our data were consistent with those reports from the same region. The commonest congenital CHD was TGA seen in 10 (20%) patients, followed by PT in 8 (16%) which is similar to the Saudi study. The most common congenital CHD like aortic stenosis and coarctation of aorta were seen in 11 (22%) cases in Europe. USA study while seen only in 10 (20%) in our patients. This variation could be due to ethnic, genetic or environmental factors, as well as the higher incidence of congenital heart disease and congenital anomalies in some parts of the developing countries compared to the developed countries.