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Clinical Pattern of Congenital Heart Disease among Children Admitted to Al-Sadaka Teaching Hospital, Aden. Yemen (Jan - Dec 2016)

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Abstract

Background: Congenital heart disease (CHD) has become increasingly important in recent years that cause great mortality and morbidity in developing countries because of late diagnosis and the few centers that offer open heart surgery. The main objective of this study was to determine the clinical pattern of congenital heart disease among admitted children to Al-Sadaka Teaching Hospital, in Aden city.

Patients and Methods: This is a prospective cross-sectional study conducted over a one year period (1st January - 31th December 2016) enrolling patients of both sexes from day one of life to 14 years.

Results: A total of 102 patients were included with the median age of 10 months and a male to female ratio of 1.3:1. Acyanotic CHD comprised 83 (81.4%) children and cyanotic CHD 19 (18.6%). Ventricular septal defect (VSD) (31.4%) followed by Atrial septal defect (19.6%) and Patent ductus arteriosus (15.7%) were the most common acyanotic CHD; whereas Tetralogy of Fallot (TOF) followed by Transposition of great arteries (10.7%, 4.9%) respectively were the commonest cyanotic CHD. There was no statistical significance on the types of CHD in both sexes. The principal clinical presentations were breathlessness, cough, fever and recurrent chest infections (58.8 %, 52.9 %, 47.1 %, and 45.1%) respectively. The majority of patients were picked up during infancy even though the norm is neonatal diagnosis.

Conclusion: Acyanotic lesions with VSD and cyanotic lesions with TOF were the commonest types of CHD in children admitted to our hospital. Early recognition, diagnosis of the problem and prompt referral of children with suspicion of CHD is mandatory for better management and if possible get corrective surgery done till establishment of pediatric cardiac center in Yemen.

Keywords: *Congenital Heart Disease; Ventricular Septal Defect; Tetralogy of Fallot*

Introduction

Congenital heart disease (CHD) is the most common congenital defect and is the commonest type of heart disease among children reflecting a major cause of serious morbidity and mortality [1,2]. The incidence of CHD is approximately 0.8% of live births with higher rate in those aborted spontaneously or stillborn [3]. Early recognition of such defects has great implications on prognosis.

The relative frequency of the most common lesions of CHD varies with different studies but the eight most common lesions that forms 90% of lesions according to Hugh., *et al*. [4] are: Ventricular septal defect (VSD), Atrial septal defect (ASD), Patent ductus arteriosus (PDA),

Coarctation of aorta, Tetralogy of Fallot (TOF), Transposition of the great arteries (TGA), pulmonary stenosis and aortic stenosis. While the remaining 10% consists of more complex anomalies.

The clinical presentation of CHD varies according to the type and severity of the defect [5]. In some patients it may present with or without cyanosis, clubbing of fingers to full-blown congestive cardiac failure [6,7] While some children may be asymptomatic and discovered incidentally during routine physical examination [7]. CHD is not only contributing to a significant morbidity and mortality but also causes a great psychological stress with economical burden to the whole family [8].

CHD has not been studied thoroughly in Yemen. This study aimed to determine the pattern of CHD among patients admitted to Al-Sadaka Teaching Hospital. The knowledge of the different pattern of CHD is important for the management and for health care system planning.

Methods

This was a prospective cross- sectional study carried out for a period of one year from (1st January - 31th December 2016) in the pediatric department of Al-Sadaka Teaching Hospital, which is the main teaching and referral pediatric hospital in Aden governorate. CHD is defined as structural or functional abnormalities of the heart or intrathorasic great vessels that present at birth, even if it is discovered much later as defined by Mitchell., *et al* [9]. All children suspected to have congenital heart disease attending the hospital were undergo further assessment with detailed history, clinical examination, chest X-ray and electrocardiography. Final diagnosis was confirmed by echocardiography. All children aged 14 years or below with confirmed diagnoses of CHD were included in the study. While Children with features of acquired heart diseases and normal heart on echocardiography were excluded from this study.

All the data, related to history, clinical examination, investigation were noted in a preformed data sheet with structured questionnaire. The data entered and analyzed for frequency, percentages and the median with interquartile using (The statistical package for the social science version 20) SPSS.

Ethical approval was obtained from the ethics committee of Faculty of Medicine and Health Sciences, Aden University before the study was under taken. Verbal informed consent was obtained from the patient's parent after explaining the objectives of the study.

Results

A total number of 102 patients admitted with CHD were included during the study period. There were 57 (55.9%) males and 45 (44.1%) females, with a ratio of 1.3:1. The age ranged from one day to 13 years, with a median age of 10 months. The commonest age group for patients admitted to hospital was between (29 days - 1 year) 49% followed by the age of (> 1 year to 5 years) 22.6% (Table 1).

Variables	No.	%
Sex		
Male	57	55.9
Female	45	44.1
Age groups		
0-28 days	19	18.6
29 days-1year	50	49
> 1 year - 5 years	23	22.6
> 5 years - 14 years	10	9.8

Table 1*: Distribution of admitted patients with CHD by sex and age groups.*

A higher proportion of patients 83 (81.4%) presented with acyanotic CHD while cyanotic CHD manifested in 19 (18.6%) of patients (Figure 1).

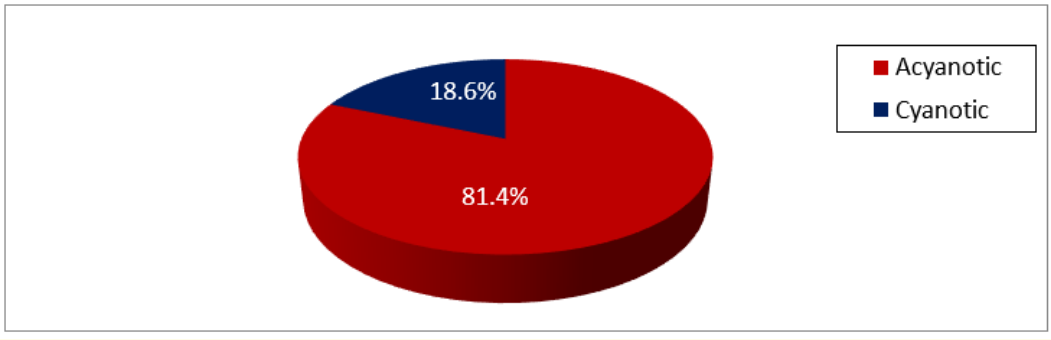

Figure 1: *Distribution of patients according to types of CHD.*

Among the acyanotic CHD the commonest lesion was Ventricular septal defect (31.4%), followed by Atrial septal defect and Patent ductus arteriosus (19.6%, 15.7%) respectively. Whereas Tetralogy of Fallot followed by Transposition of the great arteries were the commonest cyanotic congenital heart disease (10.7%, 4.9%) respectively. The distribution of sex in each type of CHD was not statistically significant (p = 0.376) (Table 2).

Type of congenital heart disease	Sex					Total
	Male		Female			
	No.	%	No.	%	No.	%
Acyanotic						
Ventricular septal defect	20	62.5	12	37.5	32	31.4
Atrial septal defect	8	40	12	60	20	19.6
Patent ductus arteriosus	8	50	8	50	16	15.7
Pulmonary valve stenosis	6	66.7	3	33.3	9	8.8
VSD+ASD	2	66.7	1	33.3	3	2.9
Endocardiac Cushing defect	1	50	1	50	2	1.9
Dextrocardia	0	0	1	100	1	1
Cyanotic						
Tetralogy of Fallot	8	72.7	3	27.3	11	10.7
Transposition of great arteries	3	60	2	40	5	4.9
Tricuspid atresia	1	50	1	50	2	2.9
Single ventricle			1	100	1	1
Total	57	55.9	45	44.1	102	100

Table 2: *Relative frequency of congenital heart disease by sex (n = 102).*

The major clinical presentations were breathlessness, cough, fever and recurrent chest infections (58.8 %, 52.9 %, 47.1 %, and 45.1%) respectively (Table 3).

Clinical presentations	No.	%
Breathlessness	60	58.8
Cough	54	52.9
Fever	48	47.1
Recurrent chest infections	46	45.1
Poor weight gain	32	31.8
Poor feeding	29	28.4
Easy fatigue	25	24.5
Heart failure	21	20.6
Cyanosis	19	18.6
Dysmorphic feature	12	11.8
Clubbing	8	7.8
Hypoxic spells	5	4.9

Table 3: *Distribution of patients according to clinical presentation.*

Discussion

Congenital heart disease has become increasingly important in recent years that cause great mortality and morbidity in developing countries because of late diagnosis and the few centers that offer open heart surgery [10,11].

Male children outnumbered the females which was similarily reported by Amro in Jordan [12] and Ibrahim in Sudan [13].

When considering the age at diagnosis, we found a significant numbers of patients with CHD who were picked up in infancy. This finding is consistent to other studies conducted in Yemen [14], Saudi Arabia [15], Nepal [16] and Pakistan [17] but this finding is contrary to what has been obtained in developed countries where neonatal diagnosis is the norm and there is a trend toward fetal diagnosis and management [18].

In this study the main symptoms with which children presented were breathlessness and cough, which falls in agreement to similar reports in the literature [13,16,19].

CHD have a multi-factorial inheritance and result from a combination of both genetic predisposition and environmental stimuli [3]. In the literature review, the highest frequency of CHD presented among patients with chromosomal abnormalities with the highest proportions of cardiovascular anomalies among Down's syndrome [20,21]. These findings are comparable to the results of this study where about 11.8% of our patients had dysmorphic features suggesting chromosomal abnormalities, with 9.8% having Down's syndrome [16]. This finding emphasizes the importance of genetic counseling to patients with family history of congenital heart disease.

The pattern of CHD in this study showed that the majority of patients were admitted with acyanotic CHD (81.4%), that was similarly reported by Al-Hibshi in Yemen [14], Amro in Jordan [12], Ramachandran in Nepal [16] and Fazil in Pakistan [17].

On the other hand, Ventricular septal defect is the commonest acyanotic CHD (31.4%) comparable with the finding of studies conducted in Saudi Arabia, Nepal and Pakistan [15-17,22].

Atrial septal defect was the second most common acyanotic CHD accounting (19.6%) in our study, which is considered slightly higher than that reported from Jordan [12], Nepal [16] and Saudi Arabia [22]. Patent ductus arteriosus presented in about (15.7%) of our patients comparably similar to studies conducted in Pakistan [17], Saudi Arabia [22] and Turkey [23] while higher than that reported in Jordan and Sudan [12,19] but lower that in Nepal [16].

Regarding cyanotic CHD, Tetralogy of Fallot was the commonest cyanotic CHD comprising 10.7% of patients. This finding is consistent to what has been reported from Yemen [14], Jordan [12], Nepal [16]. While Transposition of the Great Arteries comprised (4.9%) which was comparatively lower than other reports in the literature [24,25] but higher that reported in Nepal (1.8%) [16]. This finding could be explained by the fact that most of the cyanotic newborns died before accurate diagnosis was established due to inadequate diagnostic facilities.

Finally, the prompt diagnosis in early neonatal and infancy together with treatment of congenital heart disease by surgery or interventional cardiac catheterisation is quite expensive and expense will be considered a great barrier to achieving good cardiac care with better outcome of these children.

Conclusion

Acyanotic CHD was the main cause for admission of patients with CHD. VSD, ASD and PDA were the commonest acyanotic lesions while TOF and TGA were the commonest cyanotic lesions. A higher proportion of patients presented during infancy. Early detection of CHD is very important for proper management, so proper clinical examination and expert echocardiography are considered a gold standard for the diagnosis of CHD. Special cardiac center should be established in our region in order to manage the patients effectively without delay.

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Conflict of Interest

There is no conflict of interest to declare.

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