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## Determination of the prevalence of congenital heart disease in the patients admitted to the heart clinic

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### ABSTRACT

**Objective:** To investigate the prevalence of congenital heart disease (CHD) among the patients who referred to the heart clinic so as to make an early and correct diagnosis.

**Methods:** In this descriptive-cross sectional study, all the patients admitted to the heart clinic who had symptoms or signs of CHD were included. The data were collected in one year based on the medical records. The main variables consisted of age, gender, history of folic acid consumption by the mother in pregnancy, clinical signs, symptoms and so on.

**Results:** Among the 763 admitted patients, 498 were males and the rest were females. Infants were the most common group and teenagers were the least one. The most common findings for which the patients had been referred were chest pain and a murmur heard during a normal physical examination. Based on the echocardiography findings, ventricular and atrial septal defects were the most common ones. The history of folic acid consumption was negative in 168 mothers within their pregnancy.

**Conclusions:** Since the causes and risk factors in the incidence of CHD in children are numerous, we recommended that the information about these diseases should be given to the community and strengthen the referral system, design registration system of CHD set up in the country round.

## 1. Introduction

Congenital heart disease (CHD) is a subgroup of the cardiovascular diseases which involve septa, valves, arteries and veins. These defects take place during the embryogenesis and may present at birth, childhood and even during adulthood. The congenital defects might be detected incidentally in a routine physical examination, or be expressed by cyanosis, clubbing or respiratory distress[1-3].

CHD is the most common congenital anomalies[4,5], with a variant prevalence in different parts of the world, having an average around 8 per live birth[1,6]. Nowadays, the mortality of CHD among infants and children has decreased which is due to early diagnosis and treatment[7].

The progresses made in the care of children with CHD and the new modalities have led to the better diagnosis of this kind of diseases[8,9]. Most of the investigators involved are seeking for the etiology and a more perfect treatment[10].

It is quite clear that early and correct diagnosis of these diseases leads to decreased morbidity and mortality[11,12]. Performing echocardiography after birth even for subtle symptoms and signs may detect some unrecognized diseases, such as a large ventricular septal defect (VSD), patent ductus

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arteriosus (PDA) and atrial septal defect (ASD) in the neonatal period[13].

Based on the above mentioned, this study was done for knowing the prevalence of the CHD in the patients who referred to the heart clinic, so as to have early and correct diagnosis as soon as possible and get our patients fixed medically and/or surgically in a suitable and quick manner.

## 2. Materials and methods

In this descriptive study, all the patients admitted to the heart clinic who had symptoms or signs of CHD were included. The data were collected during one year based on the medical records. The main variables consisted of age, gender, history of folic acid consumption by the mother in pregnancy, clinical signs, symptoms and so on. The data analysis was done by “Stata Software”.

One (numbers-percent) and two dimensional tables were used for the evaluation of incidence and the disease distribution based on other variables respectively. For quantity variables, averages and variance were utilized.

## 3. Results

In this descriptive-cross sectional study, all the children admitted to Imam Reza heart clinic, either having a related symptom or referred from other clinics, offices, etc., were evaluated. The age distribution of the patients is shown in Figure 1.

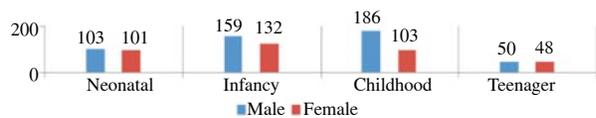


Figure 1. The age distribution of the patients who referred to heart clinic.

The most common findings in order of frequency were heart murmurs and chest pain. Other symptoms and signs are depicted in Figure 2.

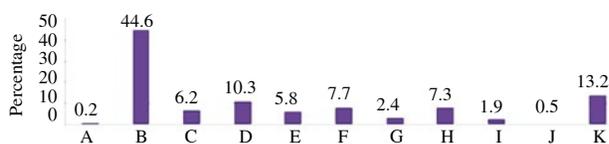


Figure 2. The symptoms and signs of patients referred to pediatric heart clinic.

A: None; B: Murmur; C: Cyanosis; D: Chest pain; E: Tachycardia; F: Prolonged fever; G: Dyspnea; H: Other; I: Murmur + cyanosis; J: Cyanosis + chest pain; K: Missing.

Based on echocardiography done for 763 patients, 314 were normal and among those with an abnormal finding in echocardiography, VSD and ASD were the most common and

transposition of great arteries (TGA) was found in only one patient (Figure 3).

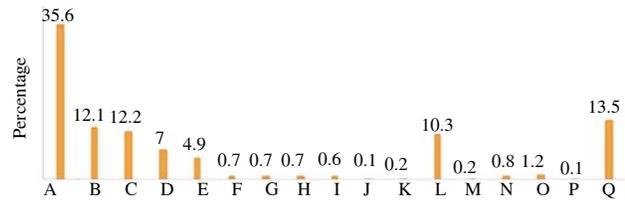


Figure 3. The frequency of echocardiographic findings in patients referred to heart clinic.

A: Normal; B: VSD; C: ASD; D: PDA; E: Mitral valve prolapse; F: Aortic regurgitation; G: Aortic stenosis (AS); H: Tricuspid regurgitation; I: Tricuspid atresia; J: TGA; K: Tetralogy of fallot; L: Others; M: VSD + PDA; N: VSD + AS; O: VSD + TGA; P: PDA + AS; Q: Missing.

Most of our newborns were evaluated while hospitalized in NICU. Among infants, children and teenagers, most of them had been referred by other physicians, and 26 cases had come by their parents. Of those patients who had murmurs, cyanosis, chest pain, tachycardia and prolonged fever, a simple follow-up was recommended. On the other hand, for those who had dyspnea, murmurs and/or chest pain with cyanosis, suitable interventions including surgery was suggested.

A follow-up was recommended for most of the patients visited the NICU and outpatient department, while for those visited in the PICU, surgery or other interventional modalities were proposed, which were significant statistically ( $P = 0.001$ ).

Among male and female patients, the most mothers of male and female patients (62.3% versus 57.5% respectively) had taken folic acid pills during pregnancy.

Among all the groups, the mothers who had taken folic acid pills regularly were the most in contrast to those not taken in an ordered manner.

All the patients with tricuspid atresia and transposition of the great arteries were referred for surgery. Most of the rest with other diagnoses, including tetralogy of fallot were followed-up.

## 4. Discussion

Among all 763 patients admitted in Imam Reza hospital, 314 cases (41.2%) had normal echocardiographies and CHD was detected in 449 (58.8%) patients. A similar study in Pakistan demonstrated the prevalence of 89.3% for CHD and 10.7% for the acquired heart diseases[12].

In our study, the most common diagnoses were VSD, ASD, PDA and mitral valve prolapse in a decreasing order of frequency.

In the study done by Mohammad N *et al.* in Pakistan, VSD was the most CHD diagnosed, and ASD, TOF and PDA were diagnosed in a decreasing order of frequency[12]. Also in the

study done in India and Taiwan, the most common CHD was VSD[13-15]. In the study done by Ahmed *et al.*, ASD was the second most common CHD found[16].

In the present study, TOF was detected in only 0.2% of our patients which was not compatible with the study done by Humayun in cyanotic CHD in neonates (25%)[17].

The least common diagnosis in our study was TGA (1%), which did not match the results of the study in Atlanta[18]. Also this diagnosis was detected to be about 21% in some parts of France[19].

In the present study, murmurs, chest pain, prolonged fever and cyanosis were the most common findings for which the patients had been referred. In the study done by Mohammad N, *et al.*, dyspnea, dysphagia and cough were the main reasons for referral[12]. Also our results were not compatible with those of studies done in Nigeria and Nepal[20,21].

### Conflict of interest statement

We declare that we have no conflict of interest.

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