



PREVALENCE AND PATTERNS OF CONGENITAL HEART DISEASES AMONG CHILDREN OF BLOCK KATRA - A NORTHERN PART OF INDIA

Paediatrics

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ABSTRACT

Background: India has enormous burden of congenital heart disease due to a very high birth rate. Ten percent of infant mortality in India is due to CHDs alone. Since mortality and morbidity from cardiac disease among children in developing countries are gaining recognition, there is a need for more studies on CHD in the Indian subcontinent.

Objective: To assess the overall prevalence and pattern of congenital heart diseases (CHD) among children from all the schools, anganwadi centres, slum areas of Block Katra, and all new born babies across the various delivery points of Block Katra.

Material and Methods: This cross sectional study was conducted from January 2018 to December 2018. Children were screened by two teams for the signs and symptoms suggestive of CHDs. The selected children were then examined by the pediatrician at CHC Katra and if required sent for echocardiography to GMC Jammu. Prevalence rates of CHD was calculated.

Results: Out of 18485 children screened in Block Katra, 43 were diagnosed with CHD giving a prevalence of 2.3 per 1000 individuals. There were 26 females as compared to 17 males. Majority of CHDs were seen among 6-18 years age group (n=20) followed by 0-3 years age group (n=15). Thirty children were having acyanotic congenital heart disease contributing to more than 69.77% of all CHDs, 10 children (23.26%) had cyanotic CHD and 3 children (6.97%) had obstructive lesions. VSD was the most common acyanotic CHD while TOF was the most common cyanotic heart disease.

Conclusion: The prevalence of CHD in this Northern part of India is comparable with the rest of country and world.

KEYWORDS

Children, Congenital heart disease, Katra, Prevalence, Tetralogy of Fallot Ventral Septal defect,

BACKGROUND

Congenital heart diseases refer to structural or functional abnormality of the heart or adjacent great vessels detected either at time of birth or later in life. ^(1,2) These defects are often detected in neonatal period, infancy or childhood, although it is not uncommon to detect uncorrected CHD in adults in developing countries like India. These contribute to about twenty-eight percent of all major congenital anomalies ⁽³⁾ Reported birth prevalence of CHD varies widely among studies worldwide. The estimate of 8 per 1,000 live births is generally accepted as the best approximation ⁽⁴⁾.

India has enormous burden of congenital heart disease due to a very high birth rate. It is estimated that over 180,000 children in India are born with CHD every year ⁽⁵⁾. According to a large hospital based study from India, the incidence of congenital heart disease is 3.9/ 1000 live births. In community based studies from India the prevalence of CHD ranges from 0.8-5.2/1000 patients ⁽⁶⁾. The absolute number of babies with CHD is even higher if all spontaneously aborted pregnancies and neonatal deaths are taken into account. In an autopsy study done on 270 neonates and infants, it was found that fetal coarctation of aorta, transposition of the great arteries (TGA), and aortic atresia are the three major cardiac anomalies responsible for death in neonates. ⁽⁷⁾ Nearly 27.5% of stillbirths are due to CHDs. ⁽⁸⁾ Ten percent of infant mortality in India is due to CHDs alone. ⁽⁵⁾ Thus, many children die each year from CHD, while many more remain in desperate need of appropriate treatment in the developing world due to lack of facilities. ⁽⁹⁾ Since mortality and morbidity from cardiac disease among children in developing countries are gaining recognition, there is a need for more studies on CHD in the Indian subcontinent. Accurate estimation of the prevalence and distribution pattern of various CHDs will help us to gauge the severity of the burden and take effective steps for the better management of the disease. The present study is aimed at estimating the prevalence of different CHDs among children of Block Katra,

District Reasi, Jammu and thus add to the existing information regarding overall CHD prevalence of India.

AIMS AND OBJECTIVES

To assess the overall prevalence and pattern of congenital heart diseases (CHD) among children of Block Katra.

MATERIAL AND METHODS

The present cross sectional observational study was conducted over a period of 1 year from January 2018 to December 2018 at CHC Katra located in Jammu, J&K, we screened children from all the schools, anganwadi centres, slum areas and all the newly born babies from all the delivery points of this Block including three PHCs and CHC Katra. Permission was taken from the district education officer and the respective principals of the schools and the parents of children from anganwadi centres, slum areas and new borns to carry out the study.

School children of all primary, middle and higher secondary schools (total 114 schools), children from all anganwadi centres (total 128 anganwadi centres) slum areas, and the new born babies from all the delivery points (3 PHCs and CHC Katra) were included in thus a total of 18485 children were screened. After obtaining necessary permissions and consent, all children were screened for congenital heart disease by the health teams. There were two teams each consisting of a trained doctor, staff nurse and a pharmacist who would visit all the schools, anganwadi centres and delivery points in this block, prepare their health cards, treat minor ailments and screen them for possibilities of CHD.

Any patient with signs and symptoms suggestive of CHD like shortness of breath and or excessive sweating while feeding, frequent pauses while breast feeding, bluish discoloration of lips and tongue, failure to thrive, clubbing, palpitation, any discrepancy in pulse,

cyanosis, heart murmur, abnormal chest X-ray, recurrent chest infections, swelling of feet, chest and abdomen pain, and loss of consciousness, etc. were identified for further evaluation. They were then re-examined by the pediatrician at CHC Katra. Those with suspected cardiac lesions were undergone echo-cardiographic examination at GMC Jammu for confirmation of the diagnosis. Classification of CHDs was based on the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10). CHDs can be broadly divided into 3 classes: left-to-right shunts, right/left heart obstructive defects, and cyanotic CHDs. Left-to-right shunts, or acyanotic CHDs, include ventricular septal defect (VSD), atrial septal defect (ASD), Eisenmenger complex, atrioventricular (AV) canal defect, and patent ductus arteriosus (PDA). Cyanotic CHDs include tetralogy of Fallot (TOF), truncus arteriosus (TA), tricuspid atresia, Ebstein anomaly, TGA, total/partial anomalous pulmonary venous connection (T/PAPVC), situs inversus totalis, double-outlet right ventricle (DORV), and double-chambered right ventricle. Right/left heart obstructive defects include coarctation of the aorta (CoA), bicuspid aortic valve (BAV), aortic stenosis (AS), and pulmonary stenosis (PS). Prevalence rates were calculated by dividing the number of cases of a CHD by the total number of patients examined during the study period. The CHD prevalence pattern was also compared with studies from different regions of India. All statistical tests were performed using SPSS software (SPSS Inc., Chicago, IL, USA). Prevalence, age and sex specific frequency of all kinds of CHDs observed were computed.

RESULTS

A total of 18485 children including 353 newborn babies from 3 PHCs/home deliveries and 1 CHC (Katra), 4564 children from 128 anganwadi centres excluding adolescent females, 13433 children from 114 schools of Block Katra and 135 children from slum areas were screened for this study. Out of 65 children sent to GMC Jammu for undergoing Echocardiography, 43 were diagnosed with CHD giving a prevalence of 2.3 per 1000 individuals.

Prevalence of CHD= No.of children detected with CHD

Total number of Children screened

$$= \frac{43 \times 1000}{18485}$$

$$= 2.3 \text{ per } 1000 \text{ (1.7-3-1)}$$

Maximum children with CHD belonged to age group of 6-18 years(20 i.e 46.5%) followed by 0-3 (15 i.e 34.8%).(Table 1) Regarding sex distribution, Female patients were more as compared to males as there were 26 females as compared to 17 males.(Fig.1)

Thirty children were having acyanotic congenital heart disease i.e Right to left shunt defects contributing to more than 69.7% of all CHDs, 10 children (23.3%) had cyanotic CHD and 3 children (6.9%) had obstructive lesions. Nineteen children had VSD alone while 3 patients with VSD had associated aortic regurgitation, ASD, PDA respectively giving the prevalence of 1.1 per thousand children. ASDs and PDA consisted of 11.6% and 6.9% of all CHDs with a prevalence of 0.27/1000 and 0.16/1000 respectively. Tetralogy of Fallot (TOF) was the most common among cyanotic heart diseases constituting 18.60% of all CHDs with prevalence of 0.43/1000 children. One male child with TOF died at the age of 2 months during the study period. The other cyanotic CHDs detected were DORV (n=1) and DORV with VSD with PS (n=1). Among the obstructive lesions 2 children had Bicuspid aortic Valve and 1 patient had pulmonic stenosis. (Fig 2 , Fig3 and Fig 4)

DISCUSSION

The present study included all children of Block Katra right from new borns to all school going children up to the age of 18 years and also children from anganwadi centres and slum areas. The prevalence of CHD estimated was 2.27 per 1000 children. The majority of prevalence studies done in India were either hospital based or school based. School based studies doesn't reflect the true picture as they cannot screen children in the preschool age group and also miss many children with severe CHD who might had dropped out of school because of the low socioeconomic status or prolonged and repeated illnesses. These studies reported a prevalence ranging from 1 per 1000 to 5 per 1000 individuals. (10-14). Higher prevalence rates have been reported by many hospital based studies ranging from 3-26.4 per 1000

individuals. These studies mostly included either neonates or children up to certain age group. (6, 15, 16, 17-20). Screening all neonates with echocardiography often leads to over estimation as it detects many minor lesions also like small VSDs, ASDs, PFO, and PDA which are likely to be spontaneously corrected by a certain age. The present study is unique in itself as it included all children from neonates to 18 years of age including anganwadi kids and also children from slum areas.

In the present study acyanotic congenital heart disease contributed to 69.77% of all CHDs. Similar results were found by Kapoor R et al, Nisale SH et al, Wannu KA et al and Saxena A et al (6,21,22). Similar to the study done by Saxena A et al (23) which showed VSDs (restrictive 43.9% and non restrictive 20.7%) as the most common CHD, VSD was found in 51.1% of all CHDs in the present study. As reported by Nisale SH et al and Bhardwaj R et al (24), females were found more affected with CHDs than the males in the present study. TOF was detected in 8 children comprising 18.6% of all CHDs comparable to 13.38% of TOF cases out of all CHDs in the study done by Smitha R et al (15) who studied the prevalence of CHDs for five years in Mysore hospitals. Sawant SP et al also found that TOF was the most common cyanotic CHD with a prevalence of 1.13 per 1000 live births(16)

Bhat NK et al (19) in their study of CHDs Uttarakhand, observed a prevalence of 8.54 per 1000 children attending hospital. Only one fifth cases were diagnosed in neonatal period and the diagnosis was delayed beyond infancy in more than half of the cases. Similar to the above results, in the present study, single case of VSD was detected in the neonatal period while 10 cases (23%) were detected up to the age of one year. Although the proportion of children diagnosed with CHDs in less than 3 years age group was higher as compared to the older children.

CONCLUSION:

The prevalence of CHD in this Northern part of India is comparable with the rest of country and world.

Tables and figures

Fig 1 Distribution of CHD patients according to sex

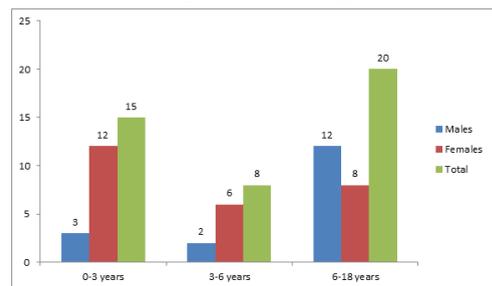


Fig 2 Distribution of Left to Right Shunt defects among patients

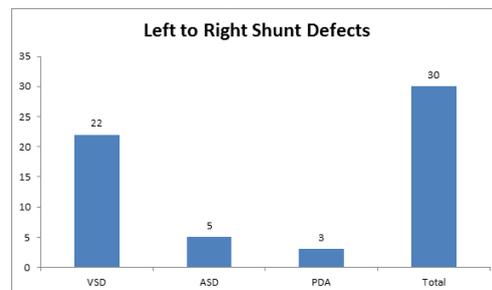


Fig 3 Distribution of cyanotic Heart diseases among patients

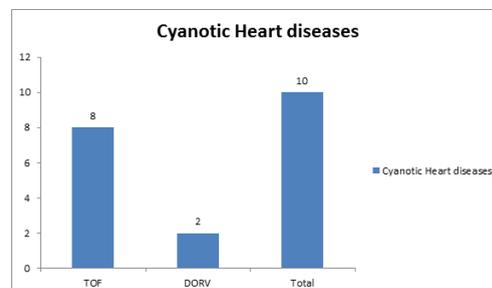


Fig 4 Distribution of patients according to right to left obstructive defect

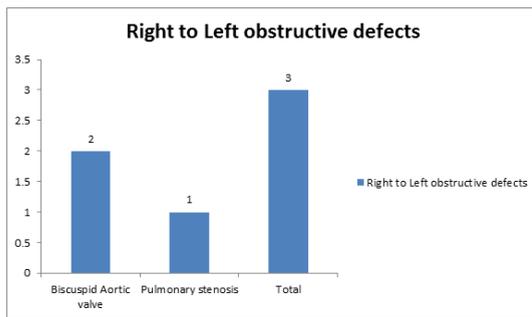


Table 1: Age and Sex Wise Distribution of Various Congenital Heart Diseases

Type of CHD	0-3 years		3-6 years		6-18 years		Total
	M	F	M	F	M	F	
VSD	1	10	1	5	3	2	22
ASD	0	0	0	0	3	2	5
TOF	2	1	1	1	1	2	8
PDA	0	1	0	0	1	1	3
DORV	0	0	0	0	1	0	1
DORV WITH VSD WITH PS	0	0	0	0	0	1	1
BICUSPID AORTIC VALVE	0	0	0	0	2	0	2
PS	0	0	0	0	1	0	1
Total	3	12	2	6	12	8	43

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