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Prevalence of Congenital Heart Disease at Tertiary Care Hospital of Uttarakhand

Anurag Rawat
Department of Cardiology, Himalayan Institute of Medical Sciences,
Dehradun,Uttarakhand, India
E mail: anuragrwt@gmail.com

Abstract

Background

Congenital heart disease (CHD) is a major cause of morbidity and mortality amongst the children. It is quite imperative to determine its prevalence amongst the various age groups to recommend change in the health policies.

Objectives

The present study was conducted to find the prevalence and pattern of congenital heart disease (CHD) at a tertiary care hospital in Uttarakhand, India.

Methods

A thorough medical examination was conducted for all babies and children up to more than 10 years of age who presented to the institute over a period from January 2016 through January 2021. Those suspected of having a CHD, were further evaluated with ECG, chest radiography and the echocardiography.

Results

Out of thetotal 1155 children who presented in this hospital, 470 were identified as having congenital heart defects. Only one fifth cases were diagnosed in neonatal period and the diagnosis was delayed beyond infancy in more than half of the cases. The commonest defects observed were Ventricular Septal Defect (VSD) in 37.23%, Atrial Septal Defect (ASD) in 19.15%, Patent Ductus Arteriosus (PDA) in 12.77%, Tetralogy of Fallot (TOF) in 12.34% andPulmonary Stenosis (PS) in 5.75%. Only 9.29% of children with CHD underwent definitive treatment.The most common clinical presentations were breathlessness (41.70%), LRTI (22.13%), congestive heart failure (CHF) (17.87%), developmental delay (7.66%), infective endocarditis (3.83%) and cyanotic spell (1.49%). The mortality rate was 20%.

Conclusion: CHD at a tertiary referral hospital in Uttarakhand India was found to be prevalent amongst the infants of age 1 month to 1 year. VSD was found to be most common acyanotic heart disease and TOF as the most common cyanotic heart disease.

Key words: Congenital heart disease, Ventricular Septal Defect, Atrial Septal Defect, Patent Ductus Arteriosus, Pulmonary Stenosis, Tetralogy of Fallot, Transposition of Great Arteries, Uttarakhand.

Introduction

The disease of heart (or great vessels) present at the time of birth of child is called as a Congenital Heart Disease (CHD) whose prevalence ranges from 19 to 75 per 1000 live births all across the World[1]. In past years, a significant improvement in the medical care and thus increased survival rates has been observed in children with CHD due to advancement in the fields of paediatric cardiology and cardiac surgery[1]. 90% of children born with CHD are expected to survive, however, they are prone to long-term complications and comorbidities.

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It leads to deficits in cognitive, language and motoric development in children. The development outcomes have been observed to be worse in children with cyanotic heart disaeses as compared to acyanotic heart diseases[2-5]though few studies do not report any systematic differences between the two kinds of defects[6]. In India, 10% of the mortality amongst infants is due to CHD. The prevalence of CHD in India has been found to be quite variable. The present study was conducted to study the prevalence of CHD in a tertiary care hospital of Uttarakhand.

Materials and Methods

This study was carried out in Himalayan Hospital, a tertiary care teaching hospital of Uttarakhand. The patients from lower to upper middle-class strata visit the hospital. The record of all live birth child in the hospital from January 2016 to January 2021 were retrospectively analyzed along with all the records of pediatric first visit OPD (outpatient department) and IPD (indoor patient department) patients between 0 to more than 10 years, during the same period. Children diagnosed with CHD were analyzed further. Clinical examination, 2D echocardiography and color doppler were used as tools for diagnosis of CHD.

Results

A total of 1155 cases were investigated out of which 40.7% were found to be of CHD. The distribution of CHD gender wise was: 60% males and 40% females. This study showed that maximum number of cases were seen in the in the age group of 1 month to 1 year (37.87%) (Table 1). Breathlessness and LRTI were observed to be the most common symptoms followed by congestive heart failure (Figure 1).

Table 1: Age-wise distribution of congenital heart disease

Age	% of CHD
< 1 month	11.70
1 month – 1 year	37.87
1 year – 5 year	22.55
5 year – 10 year	15.96
> 10 year	11.92

Acyanotic heart diseases were found to be more frequent (85.53%) than cyanotic heart diseases (14.57%) (Table 2). The most frequent defect observed was VSD in 37.23% cases followed by ASD in 19.15%, PDA in 12.77%, TOF in 12.34% and PS in 5.75% cases.

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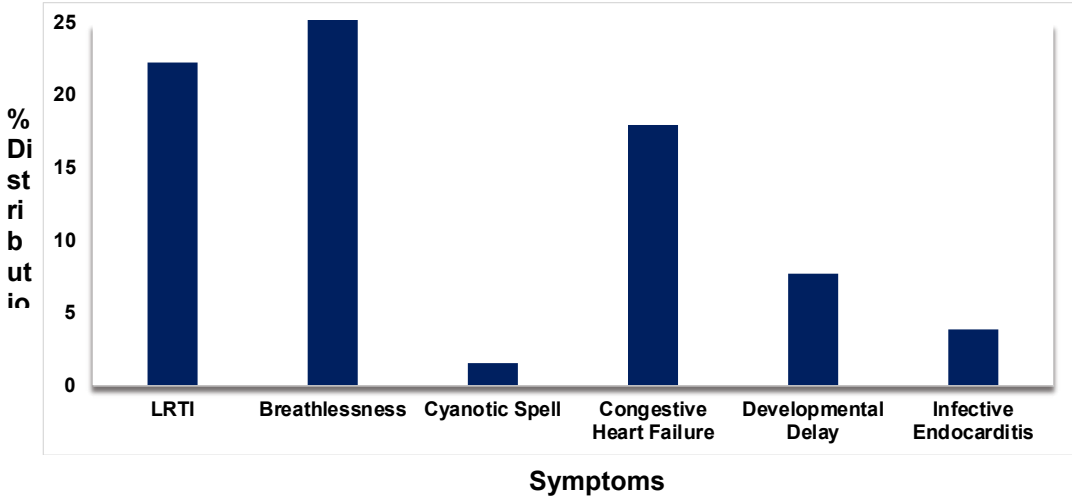

Figure 1: Distribution of various symptoms amongst the cases of CHD

Table 2: Two-dimensional echocardiographic diagnosis of various congenital heart diseases

Diagnosis	Number	Percentage (%)
Acyanotic Heart Disease	**402**	**85.53**
VSD	175	37.23
ASD	90	19.15
PDA	60	12.77
ASD/VSD	18	3.83
Pulmonary Stenosis	27	5.75
Aortic Stenosis	10	2.13
ECD	12	2.55
Dextrocardia	6	1.28
Coaectatis	4	0.85
Cyanotic CHD	**68**	**14.47**
TOF	58	12.34
DORV	2	0.43
TrancutArterosis	1	0.21
Single Ventricle	1	0.21
TAPVC	2	0.43
Ebstein	4	0.85

Discussion

CHD constitute a significant proportion of congenital malformations present in the neonatal period and are likely to be the major cause of mortality amongst infants in the near future. Thus, it is imperative to determine the prevalence and case burden of congenital heart disease so that the recommendations can be made for incorporating changes in the health policies. The majority of studies done in Indiaare focused upon only one age group like either newborns or school going children. The studies focused only on newborns may miss out a large number of small VSD or Tetralogy of Fallot or ductus dependent lesions, which are

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observed after some time of birth. The studies focused on the prevalence of CHD in community include 5-15 year old school going children, which automatically excludes all the severe lesions. Hence, neither study present a true picture. The present study included all mild, moderate and severe CHDs in age groups ranging from 0 to more than 10 years. In this study, CHD was found to be more prevalent in male child as compared to female ones. This observation was found to be in conformity with previous studies[7-12]. The prevalence of CHD was found to be more in infants which has been reported by majority of studies done till date[12]. The breathlessness was found to be the most common symptom followed by LRTI which is in conformity with previous studies[7,10]. Developmental delay was not found to a major symptom against the cases studied. Acyanotic heart diseases were found to be more prevalent with VSD accounting to highest percentage followed by ASD and PDA. TOF was found to be the most prevalent cyanotic heart diseases. These findings are in agreement with the previous studies[9,11-14]. The limitation of this study is that approximately 20% of babies were found to have Patent foramen ovale which is considered as physiological. The preterm babies which were given medicine for closing PDA were not included in the study. The outcome of mild acyanotic lesions could not be properly assessed due to lack of autopsy in the hospital. The hospital does not have the facility of neonatal heart surgery, therefore, the outcome of the children who were referred for surgery could not be assessed. Despite all these limitations, the present study give us a very comprehensive distribution of CHD amongst the gender as well as age along with the prevalence of various types of heart diseases.

Credit authorship contribution statement

Anurag Rawat: Conceptualization; Data acquisition; Methodology; Validation. Seema Rawat: Writing-review & editing

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Consent and Ethical Approval

The institutional ethics committee of HIMS had approved this study. Data privacy and data management are followed as per the standard procedure.

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