

Clinical Pattern and Malnutrition among Children with Congenital Heart Disease at Tertiary Care Hospital

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ABSTRACT

Background and Aim: Congenital heart disease is defined as the heart or intra-thoracic great vessel structural abnormalities present since birth with significantly functional irrespective of their detection age. It is the most prominent congenital anomaly and cause of morbidity and mortality among the pediatric age group population. The present study aimed to investigate the clinical pattern and malnutrition among children with congenital heart disease.

Methodology: This descriptive cross-sectional study was carried out on 132 congenital heart disease patients in the Department of Pediatric, Imran Idrees Teaching Hospital Sialkot from January 2021 to December 2021. Children with clinical basis of cyanosis, feeding refusal, decreased activity, cough, hurried breathing, fever, and excessive sweating were enrolled. Acquired heart diseases and post-operative cardiac cases were excluded. Eligible children were assessed for sociodemographic details, physical examination, nutritional status, history, and types of congenital heart diseases. SPSS version 25 was used for data analysis.

Results: Of the total 132 CHD children, there were 92 (69.7%) male and 40 (30.3%) females. The prevalence of acyanotic heart diseases, cyanotic heart diseases, complex CHD, and valvular diseases were 98 (74.2%), 22 (16.7%), 10 (7.6%), and 2 (1.5%) respectively. Age-wise distribution of all the children were as follows: 38 (28.8%) < 1 month, 62 (47%) 1 month-1 year, 20 (15.2%) 1-5 years, and 12 (9.1%) 5-10 years. Based on presented symptoms, the incidence of breathlessness, fever, cough, and other symptoms were 68 (51.5%), 58 (43.9%), 54 (40.9%), and 49 (37.1%) respectively. The incidence of protein-energy malnutrition and normal cases were 72 (54.5%) and 60 (45.5%) respectively. Anemia was the most prevalent risk factor CHD in 52 (39.4%) cases followed by pneumonia 41 (31.1%).

Conclusion: The present study concluded that acyanotic heart diseases were the most commonly found in children followed by cyanotic, complex, and valvular diseases. Infancy and childhood age are more susceptible to congenital heart diseases. Breathlessness and fever were the most common symptoms. Nutritional anemia followed by pneumonia and failure to thrive were the major risk factors for congenital heart diseases among children.

Keywords: Congenital heart diseases, Clinical pattern, Malnutrition

INTRODUCTION

Congenital heart disease is the most prevalent congenital anomaly in the pediatric age group with prevalence of 0.6% to 9% and contributes to higher rate of morbidity and mortality [1, 2]. Congenital heart disease is defined as the heart or intra-thoracic great vessel structural abnormalities present since birth with significantly functional irrespective of their detection age [3, 4]. Advancement in diagnosis and management of congenital heart disease is seen in the recent decades [5]. In developing countries, the statistics showed that CHD survival rate significantly increased while mortality reduced from 80% to 20% [6, 7]. However, the lack of healthcare facilities and diagnosis worsen the prognosis of congenital heart disease children [8]. Ventricular septal defect (VSD) and tetralogy of fallot (TOF) are considered as most common acyanotic and cyanotic heart disease respectively in Pakistan [9]. An Indian-based study reported the incidence of VSD, atrial septal defect (ASD), patent ductus arteriosus (PDA) were 30.4%, 17.6%, and 9.6% respectively [10]. Numerous studies identified various risk factors such as anemia and pneumonia for congenital heart disease [11, 12].

Congenital heart diseases later diagnoses implicate higher risk of handicap, morbidity, and mortality. Acquiring heart disease usually refers to heart and associated blood vessels affecting conditions that advance during childhood. It might include other diseases such as cardiomyopathy, pericarditis, rheumatic heart disease, bacterial endocarditis, and myocarditis. Majority of children in Pakistan are hospitalized due to higher prevalence of myocarditis [13]. There is paucity of data on clinical presentation and malnutrition pattern of congenital heart diseases in children. Therefore, the present study aimed to evaluate the clinical pattern and malnutrition status in children with congenital heart disease.

METHODOLOGY

This descriptive cross-sectional study was carried out on 132 congenital heart disease patients in the Department of Pediatric, Imran Idrees Teaching Hospital Sialkot from January 2021 to December 2021. Children with clinical basis of cyanosis, feeding refusal, decreased activity, cough, hurried breathing, fever, and excessive sweating were enrolled. Acquired heart diseases and post-operative cardiac cases were excluded. Eligible children were assessed for sociodemographic details, physical examination, nutritional status, history, and types of congenital heart diseases. All the children with CHD were investigated. Various parameters such as comorbidities, current clinical status, risk factors, reasons for admission, and outcome were studied. Echocardiographic findings measured from lesions for congenital heart disease such as tetralogy of Fallot, ventricular septal defect, patent ductus arteriosus, and atrial septal defect. The acquired heart diseases were myocarditis, rheumatic heart disease, and infective endocarditis. Of all the cases, congenital heart disease was recorded. Maternal risk factors such as child's gender, maternal age, consanguinity, pregnancy related febrile illness, folic acid use during pregnancy, and maternal diabetes were recorded.

All the gathered data were analyzed in SPSS version 25. Numerical data was described as mean and standard deviation whereas continuous variables were expressed as frequencies and percentages. Different parameters were compared using Chi-square test taking 95% confidence interval and 5% level of significance.

RESULTS

Of the total 132 CHD children, there were 92 (69.7%) male and 40 (30.3%) females. The prevalence of acyanotic heart diseases, cyanotic heart diseases, complex CHD, and valvular diseases

were 98 (74.2%), 22 (16.7%), 10 (7.6%), and 2 (1.5%) respectively. Age-wise distribution of all the children were as follows: 38 (28.8%) < 1 month, 62 (47%) 1 month-1 year, 20 (15.2%) 1-5 years, and 12 (9.1%) 5-10 years. Based on presented symptoms, the incidence of breathlessness, fever, cough, and other symptoms were 68 (51.5%), 58 (43.9%), 54 (40.9%), and 49 (37.1%) respectively. The incidence of protein-energy malnutrition and normal cases were 72 (54.5%) and 60 (45.5%) respectively. Anemia was the most prevalent risk factor CHD in 52 (39.4%) cases followed by pneumonia 41 (31.1%). Age-wise distribution of all the children is shown in Figure-1. Figure-2 illustrates the gender's distribution. The incidence of different types of congenital heart diseases are shown in Table-I. Table-II represents the incidence of acyanotic and cyanotic heart diseases. Different symptoms of CHD are shown in Table-III. Nutritional status of congenital heart disease children is depicted in Figure-3. The prevalence of different risk factors for progression of CHD is illustrated in Figure-4.

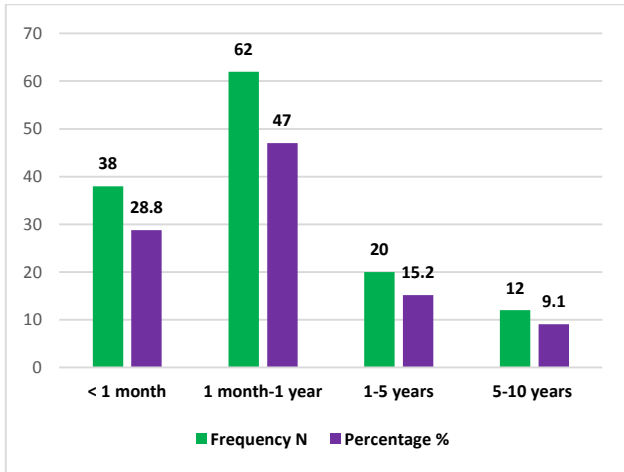


Figure-1: Age-wise distribution of CHD children (n=132)

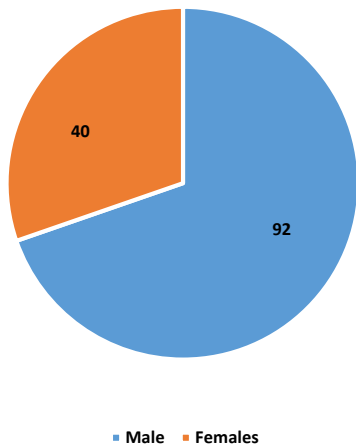


Figure-2: Gender's distribution (n=132)

Table-1: incidence of different types of congenital heart diseases

Congenital Heart Diseases	Frequency N	Percentage %
Acyanotic heart disease	98	74.2
Cyanotic heart disease	22	16.7
Complex HD	10	7.6
Valvular diseases	2	1.5
Total	132	100

Table-2: incidence of acyanotic and cyanotic heart diseases.

Acyanotic heart diseases	N (%)	Cyanotic heart diseases	N (%)
Ventricular septal defect	58 (59.2)	Total anomalous pulmonary venous connection (TAPVC)	9 (40.9)
Atrial septal defect	21 (21.4)	tetralogy of fallot (TOF)	5 (22.7)
Patent ductus arteriosus	13 (13.3)	Truncus arteriosus	3 (13.6)
Bicuspid aortic valve	3 (3.1)	Ebstein's anomalies	2 (9.1)
Coarctation of aorta	3 (3.1)	Transposition of the great arteries, or TGA	3 (13.6)
Total	98 (100)	Total	22 (100)

Table-3: Different symptoms of CHD

CHD symptoms	Frequency N	Percentage %
Breathlessness	68	51.5
Fever	58	43.9
Cough	54	40.9
Other	49	37.1

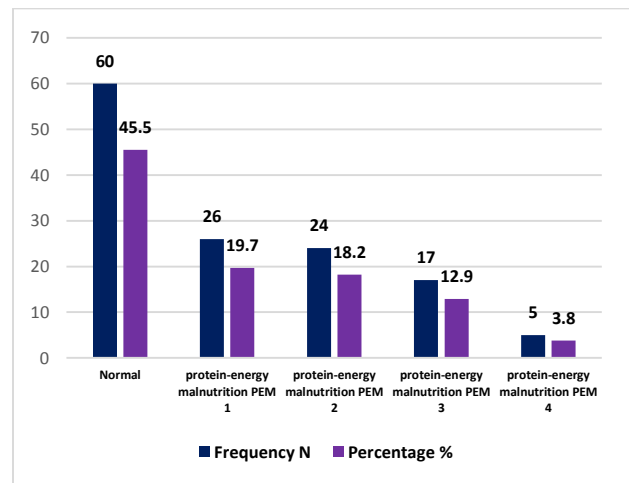


Figure-3: Nutritional status of congenital heart disease children based on IAP classification (n=132)

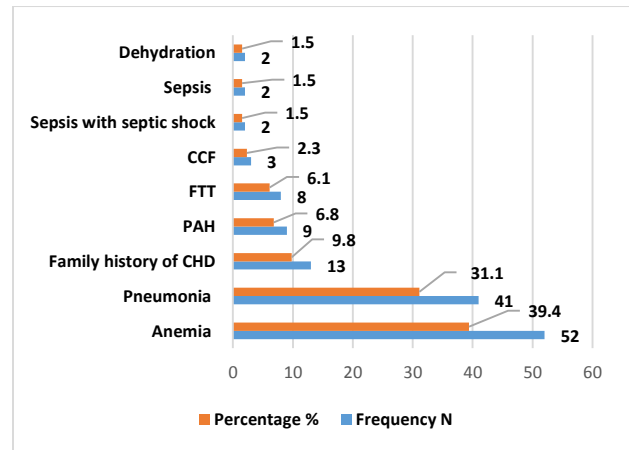


Figure-4: prevalence of different risk factors for CHD

DISCUSSION

The present study investigated the clinical pattern and malnutrition status among children with congenital heart diseases and found that acyanotic heart diseases were present in 74.2% followed by cyanotic heart disease 16.7%, complex CHD 7.6%, and valvular diseases 1.5%. Ventricular septal defect and Total anomalous

pulmonary venous connection (TAPVC) was the most prevalent acyanotic disease and cyanotic disease respectively. Male children were more susceptible to congenital heart diseases. Breathlessness was the most common symptom of CHD followed by fever and cough. Children with an age 1 month to 1 year had a higher proportion of CHD. Shah et al [14] reported that 55.9% children had congenital heart diseases in infancy. Congenital heart disease was twice as common in male compared to females. Similar findings were observed in a study conducted by Arodiwe et al [15] according to which 62% were male and 38% were females among 50 children with congenital heart diseases. Zuhlke et al [16] observed similar results in their study.

In the present study, the incidence of acyanotic CHD's was 74.2% more than cyanotic CHD's 16.7%. Similar findings were seen in a study conducted by Abqari et al [17] and reported 69% were acyanotic CHD's and 31% were cyanotic. Dolk et al [18] found that acyanotic and cyanotic CHD's were 68% and 32% respectively. VSD and ASD were major contributors to children CHD's. According to Tuomela et al [19] VSD was more common 40% followed by PDA 18% and ASD 4%.

Children with CHD's in the present study had higher protein-energy malnutrition 54.5% compared to normal children 45.5%. The protein-energy malnutrition was classified as PEM 1, 2, 3, and 4. The prevalence of PEM was comparable to other studies' findings. Raissadati et al [20] found that FTT was 11.9% among children and Rocha et al [21] reported that 40% was the incidence of malnutrition. According to Latal et al [22] the incidence of malnutrition was 92% among children with CHD's in comparison to other studies [23, 24]. Appropriate dietary and age at presentation were the most significant parameters that contributed to malnutrition. Recurrent infections, chronic hypoxia, poverty, increased basal metabolism, and decreased nutritional intake are other causes for malnutrition in developing countries.

Children with CHD had nutritional anemia as the most prominent risk factor followed by pneumonia, FTT, CCF, and PAH in our study. Septic shock, neonatal jaundice, dehydration, and sepsis were other cases included in malnutrition among children with congenital heart diseases. These findings resemble the results reported by Mukherjee et al [25] according to which 24 children out of 51 had anemia and had a higher incidence of cyanotic spell. Another study by Zimmerman et al [26] the incidence of iron deficiency anemia was 17% in children with congestive heart failure.

In our study, breathlessness was the prevalent symptom of CHD's followed by fever and cough. CCF, pneumonia, or combination of both causes breathlessness among children. Vener et al [27] reported similar complaints of breathlessness and fever in their study on children with CHD. Namuyonga et al [28] reported that breathlessness was found in 41% cases of children with CHD.

CONCLUSION

The present study concluded that acyanotic heart diseases were the most commonly found in children followed by cyanotic, complex, and valvular diseases. Infancy and childhood age are more susceptible to congenital heart diseases. Breathlessness and fever were the most common symptoms. Nutritional anemia followed by pneumonia and failure to thrive were the major risk factors for congenital heart diseases among children.

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