

# Pattern of Presentation of Congenital Heart Diseases in Children

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## ABSTRACT

**Objective:** To determine the pattern of presentation and clinical features in patients with Congenital Heart Disease admitted in Pediatric department, Saidu Teaching Hospital Swat.

**Study Design:** Descriptive / Cross-sectional study

**Place and Duration of Study:** This study was conducted at the Department of Pediatrics, Saidu Teaching Hospital Swat, from March 2018 to September 2018.

**Materials and Methods:** In this study 120 children fulfilling the inclusion criteria were enrolled after getting informed consent. The information obtained was organized on a predesigned proforma and descriptive statistics were applied on the collected data.

**Results:** In this study, the male to female ratio was 1.9: 1. Most of the children with Congenital Heart Disease presented below one year of age (57.5%), followed by 30.8% of children whose age ranged from 1 to 5 years and only 11.6% presented above 5 years. 65% of the patients presented with Respiratory distress. Fever (47.5%) and feeding difficulty (40.8%) were other common symptoms. Tachypnoea (59.1%) was the most common sign observed followed by tachycardia (55%), murmur (54.1%) and hepatomegaly (48.3%).

**Conclusion:** In our study, the most common clinical presentation of children with congenital heart disease was respiratory distress and tachypnea, most of them doing so below one year of age.

**Key Words:** Congenital Heart Disease, Tachycardia, Tachypnoea.

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## INTRODUCTION

Congenital Heart Disease (CHD) is defined as structural or functional heart defect that is present at the time of birth, even if it is discovered much later<sup>1</sup>.

Its prevalence is almost 8-9 per 1000 live births<sup>2</sup>. Women at high risk of having an infant with CHD include those with diabetes, a family history of CHD or exposure to drugs such as indomethacin<sup>3</sup>. In addition, first trimester Rubella exposure and residence at high altitudes are associated with increased incidence of Patent Ductus Arteriosus (PDA). Other infants at high risk for CHD include those with abnormalities of other systems and those with syndromes related to abnormal karyotypes<sup>4</sup>.

Congenital Heart Defects are classified into Acyanotic and Cyanotic. The common acyanotic lesions are ventricular septal defects (VSD), atrial septal defects (ASD), atrioventricular canal defect, pulmonary

stenosis, PDA, aortic stenosis and coarctation of aorta while Tetralogy of Fallot and Transposition of Great Arteries are the common cyanotic CHD. Other rare cyanotic defects include Tricuspid Atresia, Total Anomalous Pulmonary Venous Return, Truncus Arteriosus and Hypo-plastic Left Heart Syndrome<sup>5</sup>.

Children with CHD commonly present with symptoms like respiratory distress, fever, feeding difficulty, failure to thrive, exercise intolerance, and cough while tachypnoea, tachycardia, murmur, hepatomegaly, chest in drawing, basal crepitations, wheeze, central cyanosis and cardiomegaly are the common presenting signs<sup>6</sup>. Moreover, growth is more affected in children with congenital heart lesions than normal children and they often present with various degrees of malnutrition<sup>7</sup>. In acyanotic CHD, congestive cardiac failure is the most common complication while hypoxia is the primary concern in infants with cyanotic defects<sup>8</sup>. Furthermore CHD has a great deal of impact on child development<sup>9</sup>.

Rapid diagnosis and appropriate management is the key to reduce mortality and morbidity in this fragile patient population<sup>10</sup>. Most cases are detected upon referral for cyanosis, clubbing or cardiac murmur. The number of patients with CHD is on the rise because of steady addition and increased longevity. Delayed recognition of CHD may have a serious impact on the long term outcome of the affected children<sup>11</sup>.

CHD is an important group of disease, which steadily adds to the overall burden of cardiac ailments<sup>12</sup>. Despite improved medical care, CHD remains a leading cause

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of neonatal and infant mortality and morbidity and there is wide spectrum of presentation<sup>13</sup>. This study was conducted to know about the various modes of presentation of CHD in children.

**MATERIALS AND METHODS**

This cross sectional study was carried out in the Department of Pediatrics, Saidu Teaching Hospital Swat from 10th March 2018 to 9<sup>th</sup> September 2018. A total of 120 cases with Congenital Heart Disease were collected.

The sampling technique was Non Probability convenience sampling and all consecutive patients fulfilling the inclusion criteria were included.

**Inclusion Criteria:** All patients, both male and female, aged between day one to 15 years, having Congenital Heart Disease were included in the study.

**Exclusion Criteria:** Patients having acquired heart diseases like Rheumatic Carditis, Infective Endocarditis and Viral Myocarditis, were excluded from the study.

**Data Collection Procedure:** Institutional Ethical Committee permission was sought before starting the study. All patients with CHD admitted in pediatric department, presenting with symptoms like respiratory distress, fever, feeding difficulty, sweating during feeding, failure to thrive and bluish discoloration and signs like tachypnoea, tachycardia, cyanosis, murmur, hepatomegaly, severe malnutrition and clubbing were enrolled for the study after written informed consent. All this information was recorded on a predesigned proforma.

**Data Analysis:** As this was a descriptive study, so no inferential statistics were applied. Different variables were considered using means (for age) and percentages. The data was analyzed on Excel Spread Sheet.

**RESULTS**

In this study the age group of children ranged from newborn to 15 years of age. The lowest age of presentation was a newborn 2 days old and the oldest child who presented with CHD was 12 years old with mean age of 26.6 months. Most of the patients with CHD, 69 in number (57.5%), presented below 1 year of age including both neonates (0-30 days) and infants (31 days –1 year). The neonates who presented with CHD were 17 (14.2%) and the infants were 52 (43.3%). Those children who presented with CHD beyond infancy were 51 (42.5%). Out of later, 14 (11.6%) children presented above 5 years of age.

In this study, 79 (65.8%) children were males and 41(34.2%) were females with a male to female ratio of 1.9:1.

Respiratory distress was the most common symptom observed, in 78 children (65%). The most common observed sign was tachypnea, in 71 children (59.1%). Other symptoms with which children presented were fever in 57 (47.5%), feeding difficulty in 49 (40.8) %,

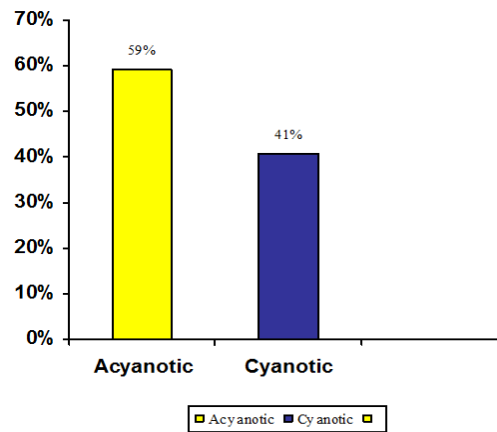
sweating during feeding in 46 (38.3%), failure to thrive in 45 (37.5%), bluish discoloration of lips, tongue and fingers in 41 (34.1%), exercise intolerance (easy fatigability) in 29 (24.1%), cough in 25 (20.8%), and chest pain in 7 (5.8%) cases. The frequency distribution of clinical signs in children with CHD is shown in Figure 2. Cardiomegaly was found in 26 (21.6%) children on chest radiograph. Distribution of types of acyanotic CHD is shown in Table 1.

**Table No 1: Distribution of types of Acyanotic CHD (n=120).**

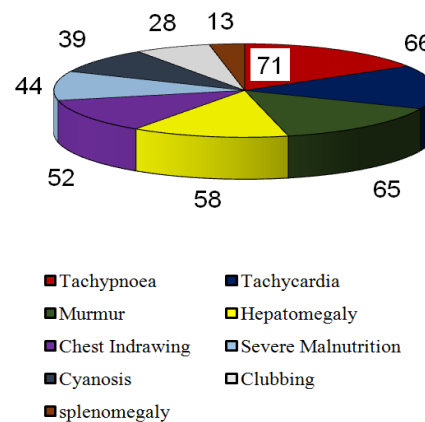
Disease	No. of cases	Percentage %
Ventricular Septal Defect	43	35.8
Patent Ductus Arteriosus	9	7.5
Pulmonary Stenosis	9	7.5
Atrial Septal Defect	8	6.7
Aortic Stenosis	2	1.7

Tetralogy of Fallot in 32 (26.7%), Transposition of Great Arteries in 15(12.5%) and Tricuspid Atresia were found in 2 (1.7%) children with cyanotic CHD.

In this study 3 (2.5%) children died. All children who died had cyanotic CHD. Among these children, one was neonates.



**Figure No.1: Frequency distribution of cyanotic and acyanotic CHD (n=120)**



**Figure No 2: Frequency distribution of clinical signs in Children with CHD (n=120)**

## DISCUSSION

Although this study was a hospital based study and gives neither the true incidence and prevalence of CHD nor its pattern of presentation in total population, yet results are comparable with other local and international studies.

CHD is an important cause of morbidity and mortality in children<sup>14</sup>. There is a wide spectrum of presentation of heart disease in children, out of which, one of the fact is that congenital heart lesions present more commonly during infancy<sup>15</sup>. Our study also concurred with this and showed that maximum number of children with CHD presented below 1 year of age. This can be further compared with the study done by Otaigbe<sup>16</sup>, where most of the patients with CHD presented between 0-12 months of age. Similarly, study conducted by Sadoh WE<sup>17</sup> showed that maximum diagnoses were made within first year of life.

The Congenital Heart Disease in children shows predominance in males<sup>18</sup>. Our study also showed similar results with 65.8% male children presenting with CHD. This can also be compared with the local studies by Zahid SB et al<sup>19</sup> and Rashid U et al<sup>20</sup>. In the later study male to female ratio was 3:1. One of the study conducted by Saleh HK<sup>21</sup> showed that females were more frequently affected than males in congenital cardiac diseases, which might be because of the fact that it was a retrospective study and was based on only referred patients for echocardiography.

In this study, 59.2% children had acyanotic and 40.8% had cyanotic CHD. This can be compared with the local studies like Mohammad N et al<sup>22</sup> and Zahid SB et al<sup>19</sup>, as well as in international data like study conducted by Shah GS<sup>23</sup>, where maximum number of children presented with acyanotic lesions.

Depending on the type of CHD, the presentation can show considerable variations. Our study showed that respiratory distress was the most common symptom. This can be attributed to the fact, that acyanotic or left to right shunt lesions were pre-dominant in our study and can be explained by the pathophysiology and clinical course of such lesions, especially VSD, which later was found in 35.8% of children in our study. After birth in patients with left to right shunts, the pulmonary vascular resistance may remain higher than normal, and thus the size of left to right shunt may initially be limited. As pulmonary vascular resistance continues to fall in the first few weeks after birth, because of the normal involution of the media of small pulmonary arterioles, the size of the left to right shunt increases. Eventually a large left to right shunt ensues, and clinical symptoms become apparent, with patient commonly presenting with respiratory distress. This is encountered usually as tachypnoea and tachycardia in the clinical setup, which both were the clinical signs frequently observed in our study. This was comparable with study conducted by Meshram RM<sup>6</sup>.

In this study, 36.7% were severely malnourished. This is comparable with one of the western studies which showed that 52% children with CHD had weight less than 3<sup>rd</sup> centile<sup>24</sup>.

In our study 5.8% children complained of chest pain. All these children were aged 8 years and above. The chest pain was related to cough involving the exertion of thoracic musculature and not due to pericardial or myocardial involvement.

Study by Goarge IO et al<sup>2</sup> showed that VSD was the most common congenital cardiac lesion. In our study too, as mentioned earlier VSD was the most common CHD. This is also comparable with studies conducted by Abah RO et al<sup>25</sup>, Kenney N<sup>26</sup> and Farooqui R et al<sup>27</sup>. Tetralogy of Fallot was the most common cyanotic CHD in our study, comparable to the study done by Amro K<sup>5</sup>.

In this study, 3 children with CHD died, who all had cyanotic lesions. Though outcome of CHD was not the objective of our study however, this indicates that early recognition and appropriate management is required as it causes death of thousands of children in developing countries.

## CONCLUSION

In our study, the most common clinical presentation of children with acyanotic CHD was respiratory distress and tachypnea, most of them doing so below one year of age. The predominant presentation of cyanotic CHD was, as expected, cyanosis. VSD was most common acyanotic lesion while the most common cyanotic lesion was Tetralogy of Fallot.

### Author's Contribution:

Concept & Design of Study:	Salman Mustaan Khan
Drafting:	Ihsan ul Haq, Sajjad Hussain
Data Analysis:	Sardar Khan, Zahir Said
Revisiting Critically:	Salman Mustaan Khan
Final Approval of version:	Salman Mustaan Khan

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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