FREQUENCY AND CLINICAL PRESENTATION OF MYOCARDITS IN PAEDIATRIC PATIENTS WITH CARDIAC FAILURE

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ABSTRACT

Objectives: To determine the frequency of myocarditis in paediatric patients presenting with cardiac failure and to describe the clinical presentation of myocarditis in children.

Material and Methods: This descriptive study was conducted at the Department of Paediatrics (Emergency and General Wards), Khyber Teaching Hospital, Peshawar from July 2003 to June 2004. A total of 100 consecutive children presenting with cardiac failure were subjected to detailed history and examination regarding its aetiology; and clinical manifestations of myocarditis were also documented on a preformed proforma.

Results: Hundred cases of congestive cardiac failure were studied. Myocarditis was found to be one of the common causes of congestive heart failure in paediatric patients, constituting 20 % of the cases. Other important causes were dilated cardiomyopath (50%), congenital heart diseases (26%) and rheumatic heart diseases (4%). Regarding myocarditis sixty percent of cases were male while forty percent were female. Majority of patients were in the age group 1-5 years constituting 35% of cases. Common presenting complaints were cough, breathlessness and orthopnoea. Common clinical signs found in all cases were tachypnoea, tachycardia and hepatomegaly.

Conclusion: Myocarditis is an important paeditric emergency leading to congestive heart failure in significant number of cases and is also an important cause of morbidity and mortality in paediatric age group. The common clinical presentation is in the form of respiratory, cardiac, gastrointestinal complaints and pallor.

Key Words: Congestive Heart Failure, Myocarditis, Dilated Cardiomyopathy, Rheumatic Heart Disease.

INTRODUCTION

Acute myocarditis is inflammation of the muscular walls of heart but it can involve the endocardium and the pericardium[1]. The incidence of myocarditis is 8-10 cases per 100,000 humans[2,3]. Myocarditis is responsible for 12 % of sudden cardiac deaths in adolescents[4]. There are multiple causes of myocarditis including infectious and non infectious. The most common causes amongst the infectious group are viruses. Different viruses have been found as the causing factors including coxsackievirus B, adenovirus, Epstein-Barr virus, cytomegalovirus, and human parvovirus B19[5,6,7].

Myocarditis presents in various ways from asymptomatic cases to cardiovascular collapse[8]. In neonates and infants it presents from nonspecific symptoms like poor appetite, fever, irritability, listlessness, periodic episodes of pallor, to signs and symptoms of heart failure and cardiogenic shock, including diaphoresis, hepatomegaly, and cardiomegaly on chest radiograph[9]. In older children and adolescents, myocarditis commonly present from non-specific symptoms to features of congestive heart failure, including lethargy, pallor, decreased appetite, abdominal pain, sweating and palpitations which is followed by breathing difficulty. Teenagers mostly present with chest pain and preserved cardiac f unction. Arrhythmias are common in all age group[10,11]. Most of the times the clinician are unable to diagnose myocarditis however, it should be suspected in any infant or child who presents with congestive cardiac failure and arrhythmias[10,11].

The diagnostic modalities for myocarditis are clinical presentation, serologic findings (cardiac enzymes)[12], electrocardiography[13], echocardiography, MRI (magnetic resonance imaging)[14] and invasive procedure (myocardial biopsy and histopathology[15].

The current study was conducted in the context to know about the frequency of myocarditis in children with cardiac failure and to document its clinical presentation.

PATIENS AND METHODS

This descriptive case series study was conducted at the Department of Pediatrics, Khyber Teaching Hospital Peshawar from July 2003 to June 2004. A total number of hundred children, age one month to 15 years presenting with congestive cardiac failure were included in the study. Children above 15 years and with primary pathology other than heart tissue like anemia, thalessemias were excluded from the study.

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All children included in the study were subjected to detailed history regarding demographic data (age, sex and region). Clinical presentation was noted and the patients were subjected to detailed general and systemic clinical examination with special focus on cardiovascular system.

X Ray Chest was done and blood was taken for cardiac enzymes from all cases. Electrocardigram and echocardiography was also done in these cases for diagnostic purpose. Complete Blood Count, Anti Streptolysin O titer, ESR (erythrocyte sedimentation rate) was done where needed.

The data collected was analyzed using SPSS version 10. The age distribution of the patients was done by making different age groups, like 1st, 2nd, 3rd and 4th and putting patients into these age groups.

Descriptive Statistics was used to calculate Mean and Standard Deviation of age. Frequency was calculated for gender and various age group of presentation. The data was presented in tables.

RESULTS

A total number of hundred patients with congestive heart failure were studied from June 2003 to July 2004, admitted to the Department of Paediatics Khyber Teaching Hospital, Peshawar.

Table 1: Aetiologies of congestive heart failure in children (n =100)

Diseases	No of Patents	Percentage %
Myocarditis	20	20
Dilated cardiomyopathy	50	50
Congenital Heart Diseases	26	26
Rheumatic Heart Diseases	4	4
Total	100	100

This study shows that myocarditis is one of the important common causes of congestive cardiac failure in paediatrics age group constituting 20 % of total cases. Other causes of cardiac failure were dilated cardiomyopathy (50%) congenital heart diseases (26 %) and rheumatic heart disease (4%) table 1.

Table 2: Frequency of myocarditis in various paediatric age groups (n =20)

Age (in Years)	No of Patents	Percentage %
< than 1	4	20
1-5	7	35
5-10	5	25
>10	4	20
Total	20	100

Table 3: Symptoms of myocarditis in children (n =20)

Symptoms	No of Patents	Percentage %
Cough	20	100
Breathlessness	20	100
Orthopnoea	20	100
Fever	16	80
Puffiness	16	80
Cyanosis	7	35
Total	20	100

Table 4: Clinical signs in patients with myocarditis (n =20)

Signs	No of Patents	Percentage %
Tachypnoea	20	100
Tachycardia	20	100
Pallor	12	60
Pedal oedema	11	55
Hepatomegaly	20	100
Total	20	100

Table 5: Echocardiographic findings in patients with myocarditis

Cardiac Parameter	Range	Mean
LVEDD	4.04-6.06	5.05
LVESD	3.35-5.21	4.100
FS (%)	12.08-22.12 %	17.1%
EF (%)	24.49-43.09 %	33.29 %
Global Hypokinesia	All cases	All cases
Total	20	100

LVEDD: Left Ventricular End Diastolic Diameter
LVESD: Left Ventricular End Systolic Diameter
EF: Ejection Fraction
FS: Fractional Shortening

The patient's age ranged from six months to fifteen years. Majority of the patients (35 %) presented

Table 6: Differentiating features of ccf due to myocarditis and ccf due to other causes and their P-valuse

(n =100)

	CCF due to Myocarditis	CCF due to other causes	P Value
Mean duration of Symptoms	< 5 days	10-14 days	P< 0.005
Mean CPK level	300 IU	< 4.0 IU	P<0.0001
Mean AST level	200 IU	< 3.0 IU	P<0.0001
Mean LDH level	400 IU	< 5.0 IU	P<0.0001
Echo Findings	Mean EF 33.29%	Mean EF 4O %	P<0.01
	Mean FS 17.1%	Mean FS 20 %	P<‘0.05

CPK: Creatine Phosphokinases
AST: Aspartate Transaminase
LDH: Lactate Dehydrogenase\\
ECHO: Echocardiogram
EF: Ejection Fraction
FS: Fractional Shortening

in preschool age i.e. 1-5 years, followed by 5-10 years of age, less than one year and more than 10 years constituting 25%, 20% and 20 % respectively table 2.

Male patients outnumbered female patients with ration of 3:2 i.e. total number of male were 12 while rest 8 were female as given in table 2.

Breathing difficulty, orthoponea and cough were presenting complaints in all cases while tachyponea and tachycardia were noted in 100 % of cases as given in table 3 and 4 respectively.

Left ventricular global hypokinesia was finding in all cases. Fractional shortening was markedly reduced in all patients with myocarditis with a mean of 17.1% while cardiac enzymes were significantly raised in all patients with myocarditis. Details regarding echo findings and cardiac enzymes are given in table 5 and 6 respectively.

DISCUSSION:

Myocarditis is one of the serious conditions leading to admission in Pediatric Intensive Care Units. As the condition is not normally considered at the presentation so most often the practitioner don not diagnose the condition in time. The same has been mentioned by Lee AF et al [16] and also discussed by Simpson KE et al[17].

Acute myocarditis remains to be significant cause of morbidity and mortality in children as shown in international studies[18,19]. In our study we also found myocarditis as one of the common cause of heart failure in children. Younas M et al found myocarditis as the most common cause of the cardiac failure in the pediatric patients[20].

Majority of our study population were in the preschool and school age group. Aziz KU conducted study at Karachi on the incidence of myocarditis in children and found it as the most frequently occurring pathology in the same age group[21]. Age group 1-5 years was also the commonly affected by myocarditis in another study conducted by Younas M et al at Lahore[22].

In our study we found that almost all cases of acute myocardits presented with signs and symptoms of cardiac failure. Same was observed in other local studies conducted in other cities of the country[21,22].

In our study male patients outnumbered the female patients. Almost same was found by Hsiao HJ et al in their study conducted at Taiwan[23].

In our study we found left ventricular dysfunction in all cases of myocarditis. Kim HJ et al found same universal fact in all patients with myocarditis[24].

Ejection fraction is an important indicator of left ventricular function. As there is left ventricular dysfunction in patients with myocarditis so the ejection is decreased. Same was in our case where we found mean ejection fraction 33.29 %. The result in a local study was near to our result conducted by Aziz KU who found mean ejection fraction of 28 % in his study population.

CONCLUSION:

Myocarditis is one of the common causes of heart failure in paediatric age group. It is extremely important to timely diagnose and treat the condition. Delay in the diagnosis can result in high mortality and morbidity.

RECOMMENDATIONS:

Myocarditis commonly presents with congestive

cardiac failure. Awareness regarding the timely diagnosis of the condition should be created amongst general practitioners. This will help in time referral and management of patients with cardiac failure.

Further studies should be conducted about this less considered or under diagnosed condition in children focusing on clinical, diagnostic and therapeutic aspects of this important issue.

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