

Review of profile of children with congestive heart failure

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Abstract

Background: Cardiac failure is a clinical syndrome where the heart is unable to provide the output required to meet the metabolic demands of the body; however, the causes and mechanisms of cardiac failure are significantly different between adults and children. **Aims and objective:** To study the profile of children with Congestive Heart Failure. **Material and Methods:** The present study was conducted in the department of pediatric from March 2003 to February 2005 at Shri Chattrapati Shivaji, Maharaj SarvopcharRugnalay, Solapur attached to Dr. Vaishampayan Memorial Government Medical College. Solapur. Patients between the age of 1 month to 12 years completed and presenting with clinical signs and symptoms of CCF were selected. A detailed clinical history was obtained regarding the duration of illness and symptomatology and progression of disease process. Following points were considered Duration of illness, Progression of complaints like grade of dyspnea at the time of onset and at the time of admission, History suggestive of infections (fever, coughs with purulent expectoration etc) **Results:** Out of total 55 patients 41.82% patients were below 1 year of age followed by 1 year to 5 years age group (27.27%). 47.27% were female and 52.73% were males. 21.82% patients had history of delay in milestones in one or more areas of growth. 80% patients had evidence of malnutrition according to IAP classification. The most common presenting symptom among the study patients was Dyspnea (89.09%) followed by Cough (67.27%) and Fever (52.73%). Tachycardia was the universal finding seen in all patients 100%. Second common finding was Hepatomegaly found in 92.73% patients and respiratory distress was the third most common finding seen in 83.64% patients. LRTI that was found to be the most common cause precipitating cause of CCF in 27.27% patients, followed by Anemia (16.36%). **Conclusion:** Thus we conclude that most common age of presentation of Congestive Heart Failure was below one year of age. 80% patients had evidence of malnutrition according to IAP classification. Dyspnea, Cough and Fever were the most common presenting symptom. While Tachycardia was the most common sign of CCF followed by tachypnea and hepatomegaly Raised JVR. HJR and S3 gallop were uncommon findings irrespective of the age of patient. Anemia and LRTI either alone or in combination were the commonest precipitating causes of CCF.

Key Word: Cardiac failure, Children, Dyspnea, Tachycardia

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INTRODUCTION

Cardiac failure is a clinical syndrome where the heart is unable to provide the output required to meet the

metabolic demands of the body; however, the causes and mechanisms of cardiac failure are significantly different between adults and children¹. In children, the causes of cardiac failure are significantly different and many cases are due to congenital malformations, such as left-to-right shunts. In these patients the function of both the right and the left ventricles will be affected and these children suffer from high-output cardiac failure. Other significant causes of heart failure in children are cardiomyopathy² and anthracycline toxicity, which lead to low-output cardiac failure. In developing nations, many cases are caused or exacerbated by anaemia, often secondary to malaria and malnutrition³. It has also recently been identified that infants in ethnic minority groups in

developed countries may be at risk of heart failure linked with hypocalcaemia and vitamin D deficiency⁴. Congestive Heart Failure is one of the common end results of many diseases. The causes of CCF are varied. These include not only the cardiac diseases, but also many other diseases in which heart is secondarily affected like hypertension, respiratory diseases or hypoglycemia. CCF is a common condition requiring hospitalization. In children, cardiac failure is most often caused by congenital heart disease and cardiomyopathy. These causes are significantly different from those usually responsible for the condition in adults, which include coronary artery disease and hypertension.

MATERIAL AND METHODS

The present study was conducted in the department of pediatric from March 2003 to February 2005 at Shri Chattrapati Shivaji, Maharaj Sarvopchar Rugnalay, Solapur attached to Dr. Vaishampayan Memorial Government Medical College, Solapur. Patients between the age of 1 month to 12 years completed and presenting with clinical signs and symptoms of CCF were selected. A detailed clinical history was obtained regarding the duration of illness and symptomatology and progression of disease process. Following points were considered Duration of illness, Progression of complaints like grade of dyspnea at the time of onset and at the time of admission, History suggestive of infections (fever, coughs with purulent expectoration etc) History suggestive of any other system involvement was also obtained. History suggestive of infective endocarditis and Past History suggestive of Rheumatic fever and RVHD (e. g. Joint swelling and pain) was enquired. Detailed developmental history was taken to find out any developmental delay. Anthropometric measurements were taken to find out malnutrition and its grade. Vital data collection such as Pulse, Respiratory rate, BP, peripheral pulses etc were recorded. Other features in general examination were noted including that are specific for CCF e. g. edema, facial puffiness. JVP, HJR Clinical signs of infective endocarditis (e. g. Rash, pallor, Icterus. Janeway lesions) were noted Detailed cardiovascular system examination was done. Respiratory system examination, per abdomen examination and CNS examination was done. Necessary investigations wherever required were done and standard treatment protocol was used to treat all the patients. The collected information from all the patients were entered in Microsoft excel and was analysed and presented with appropriate tables and graphs.

RESULTS

Table 1: Distribution according to age and sex

	No of Patients	Percentage
Age Group	1 month to 1 year	23
	1 year to 5 years	15
	5 years to 10 years	12
	10 years to 12 years	5
	Mch	29
Sex	Fch	26
		47.27

During the study period, total of 55 cases where the diagnosis of CCF was kept clinically, were admitted. In the present study out of total 55 patients 41.82% patients were below 1 year of age followed by 1 year to 5 years age group (27.27%). Also 21.82% were between 5-10 years of age and 9.09% were between 10-12 yrs of age. It was observed that 47.27% were female and 52.73% were males with male: female ratio of 1.12:1.

Table 2: Distribution according to Developmental delay and Grade of Malnutrition

Parameter	No of Patients	Percentage
Developmental delay	Yes	12
	No	43
Grade of Malnutrition	I	8
	II	18
	III	10
	IV	8
	No Malnutrition	11
		20.00

Out of total 55 patients, 12 (21.82%) patients had history of delay in milestones in one or more areas of growth. Malnutrition was graded according to IAP classification. It was observed that 80% patients had evidence of malnutrition according to IAP classification. Grade II malnutrition was most common (32.73%) followed by grade III (18.18%).

Table 3: Distribution according to Symptoms and signs

Parameter	No of Patients	Percentage
Symptom	Dyspnea	49
	Cough	37
	Fever	29
	Swelling over limbs	12
	Poor feeding	14
	Abdomen pain	4
	Abdomen distension	4
	Excessive perspiration	8
	Irritability	10
	Palpitations	8
	PND	6
	Orthopnea	4
	Tachycardia	55
	Respiratory distress	46
Sign		83.64

Raised JVP	5	9.09
HJR	3	5.45
Edema	21	38.18
S3 gallop	6	10.91
Hepatomegaly	51	92.73
Ascites	2	3.64
Splenomegaly	19	34.55
Basal crepts and Rhonchi	14	25.45
Hypotension	5	9.09
Icterus	4	7.27

The most common presenting symptom among the study patients was Dyspnea (89.09%) followed by Cough (67.27%) and Fever (52.73%). It was seen that tachycardia was the universal finding seen in all patients 100%. Second common finding was Hepatomegaly found in 92.73% patients and respiratory distress was the third most common finding seen in 83.64% patients. Raised JVP was found in only 9.09% patients. HJR was seen in 5.45% patients and S3 gallop was heard in 10.91% patients.

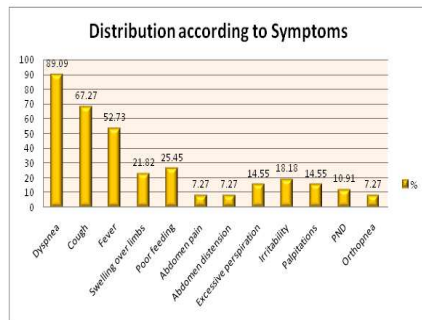


Table 4: Distribution according to Precipitating Cause of CCF

Precipitating Cause of CCF	No of Patients	Percentage
Anaemia	9	16.36
LRTI	15	27.27
Anaemia + LRTI	6	10.91
Infective endocarditis [IE]	1	1.82
Active Carditis	8	14.55
IE + Carditis	3	5.45
Inadequate Treatment	5	9.09
No precipitating cause	8	14.55

In the present study, 47 patients had one or more precipitating cause i.e. 85.45%. LRTI that was found to be the most common cause precipitating cause of CCF in 27.27% patients, followed by Anaemia 16.36% and 9.09% patients treatment related causes were found. In 14.55% patients no immediate cause of CCF was found and this can be ascribed to workload on heart leading to mechanical failure.

DISCUSSION

CCF is a common problem that frequently requires admission. Not only cardiac, but other diseases also frequently cause CCF particularly in infants. Such

patients frequently require prolonged and repeated admissions. In recent years, considerable work has been done on Pathophysiology of heart failure and compensatory mechanisms and accordingly new modalities of diagnosis and treatment has been tried. The present study was conducted in the Department of Pediatric ward in General Hospital, Solapur with the aim to study the profile of children with Congestive Heart Failure. During this study period, total of 4241 patients were admitted in Pediatric ward. Out of these, 55 patients were admitted for CCF due to various reasons or in which the final diagnosis was kept as CCF. During this study period total of 263 deaths were recorded. 11 deaths due to CCF were noted.

In the present study, patients between the age of 1 month to 12 years completed were included. Here highest incidence of CCF was found in infants below 1 year of age i.e. 41.8%. As the age increased, the incidence of CCF decreased between 10 - 12 years, only 9.09% patients presented with CCF. CHDs commonly present below 1 year of age and because infants are susceptible to other diseases or factors that may precipitate CCF. According to Norman *et al*⁵ and Talner *et al*⁶ CCF is most commonly seen in infancy. CCF in Pediatric patients usually results from CHD. These findings are similar to those noted by Artman M. in 1983⁷. The present study showed the very minimum predominance of male patients i.e. males 52% and females 48%. This difference was very less. In this study, 21.8% patients had history of delay in development in one or more areas. Out of total 55 patients, 20% had no malnutrition according IAP classification. Rest 80% patients had some degree of malnutrition. CCF may be associated with malnutrition and growth failure.⁸ This can be explained on the basis of decreased appetite, increased calorie consumption due to increased work of breathing, increased catecholamines and due to various drug effects. Cameron J W *et al*⁵ states that 80% of the patients with CHF, cyanosis or both, had acute malnutrition. In contrast 15% of the patients with either CCF or cyanosis had acute malnutrition. Frequency and severity of chronic malnutrition was also more in patients with CCF. Acute malnutrition was more prevalent in infants and chronic in toddlers. Talner N. S.⁶ stated that growth retardation was present in patients with CCF. Here acute malnutrition is more than chronic malnutrition. The most common presenting symptom among the study patients was Dyspnea (89.09%) followed by Cough (67.27%) and Fever (52.73%). In our study, Dyspnea and cough were the most common symptoms in patients of all age groups. Fever was third most common symptom. This could be because of the fact that fever was caused by infection or cardiac failure itself may be associated with mild grade, ever because CCF is a catabolic state or because of

cutaneous vasoconstriction in common sign of CCF.^{9,10} Respiratory distress is also common. Tachycardia was the most common sign seen in CCF. Second common finding was Hepatomegaly found in 92.73% patients and respiratory distress was the third most common finding seen in 83.64% patients. Raised JVP was found in only 9.09% patients. HJR was seen in 5.45% patients and S3 gallop was heard in 10.91% patients. In the present study 85.5% of patients had any of the precipitating causes. These leads to decomposition of the heart and hence clinical failure. Remaining cases, precipitating cause couldn't be found. This means that in these patients, it was the workload on heart that led to failure. In about 90% of the patients, the precipitating cause could be identified. The most common being the inadequate drug treatment next being Anaemia and infections. Particularly LRTI.¹¹ In our study 9.09% patients had inadequate treatment as a cause of failure.

CONCLUSION

Thus we conclude that most common age of presentation of Congestive Heart Failure was below one year of age. 80% patients had evidence of malnutrition according to IAP classification. Dyspnea, Cough and Fever were the most common presenting symptom. While Tachycardia was the most common sign of CCF followed by tachypnea and hepatomegaly. Raised JVR. HJR and S3 gallop were uncommon findings irrespective of the age of patient. Anemia and LRTI either alone or in combination were the commonest precipitating causes of CCF.

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