https://africanjournalofbiomedicalresearch.com/index.php/AJBR
Afr. J. Biomed. Res. Vol. 27(September 2024); 114-119

Research Article

Evaluation of Clinical Profile and Risk Factors in Dilated Cardiomyopathy Patients in a Tertiary Care Hospital of Chengalpattu District.

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ABSTRACT

Objective: To determine the clinical profile of patients with dilated cardiomyopathy and to evaluate Electro Cardiogram and echocardiographic findings in patients with dilated cardiomyopathy, in view of the high prevalence of chronic heart failure and underlying dilated cardiomyopathy.

Methods: It is a cross-sectional study conducted at Department of Medicine and Cardiology, Karpaga Vinayaga Institute of Medical Sciences after ethical committee approval. 60 diagnosed cases of dilated cardiomyopathy were collected from January 2023 to December 2023 without a history of COPD, radiation, malignancy, and drug abuse. Clinical examination, ECG and Echo-cardiographic findings were collected and documented in Microsoft Excel. Quantitative variables were expressed in mean and standard deviation. Categorical data presented in frequency and proportions.

Results: The mean age at presentation was 60.12 years. The age of presentation varies significantly between males and females. Approximately 31.6% were reported to be smokers. The common co-morbidity is diabetes. Hypertension is very less patients in our study. At presentation dyspnea was the leading symptom in 85%. Ejection fraction was not preserved among 86.7%.

Conclusion: Dilated cardiomyopathy is common in a population of middle-aged people. The most common clinical presentation is dyspnea, followed by chest pain. Common abnormalities in ECG were right bundle branch block and left atrial enlargement. Among more than two-thirds of the participants, echocardiography revealed reduced ejection fraction.

Keywords- Dilated Cardiomyopathy, Right bundle branch block, Diabetes, Ejection fraction and left ventricular failure.

Author for correspondence: Email:

Receiving date: 10/07/2024 Acceptance date: 20/08/2024

DOI: https://doi.org/10.53555/ma0t7m41

INTRODUCTION

Cardiomyopathy is primarily disease of cardiac muscle in which the myocardium grows poorly. The chief presenting symptoms are heart failure, dyspnea, and chest discomfort with or without pedal edema, orthopnea, paroxysmal nocturnal dyspnea, atrial, or ventricular arrhythmias, and sudden death. The dilated cardiomyopathy is characterized by dilatation and poor function of one or both ventricles. The prevalence of DCM is one in 250–400 patients with heart failure and one in 2500 in the general population. The incidence of DCM is seven cases per 1lakh people annually. Dilated cardiomyopathy can occur due to both familial and non-familial causes. The familial causes include mutation in the cytoskeletal, sarcomeric protein/Z-band, nuclear membrane, and intercalated disc protein genes. Non-familial causes are obesity, myocarditis, and nutritional factors[(1)].

In terms of the principal organ involved, cardiomyopathies are classified into two broad types. Primary cardiomyopathies are only a few in number and are essentially restricted to the heart muscle itself in being genetic, non-genetic, and acquired. A large number of broad systemic, that is, multi-organ illnesses, including abnormal cardiac involvement come under the heading of the secondary cardiomyopathies. Cause for primary DCM is idiopathic. Therefore, the diagnosis can be established only by ruling out secondary causes. The diagnosis of dilated types of cardiomyopathies is usually made by 2-Dimensional echocardiography. These classes share the common feature of ventricular chamber expansion and systolic dysfunction with normal LV wall thickness.

Heart failure can owe its cause to dilated cardiomyopathy. DCM causes thrombosis; ventricular and supraventricular arrhythmias; anomalies of the conduction system; progressive heart failure; and a failing reduction in the LV contractility. It can also lead to heart failure-related death. DCM, in fact, represents the most common indication for heart transplantation and the third most common cause of heart failure. It is a frequent and usually irreversible form of heart muscle disease. DCM is usually diagnosed when it is associated with important limiting symptoms and disability. It can, however, present clinically at any age. Despite its frequency in the third or fourth decade, there are reported cases in children of a tender age, approximately between one and a half to six years [(2)].

The most common cardio-myopathy is dilated cardiomyopathy. The next most common causes are the idiopathic/familial, diabetic, alcoholic and peripartum cardiomyopathies. Discovery of causative factors and rapid evolution in molecular genetics has established DCM as a diagnosis in its own right rather than an exclusionary diagnosis. The present study was undertaken to find the association of risk factors and comorbidities of patients with dilated cardiomyopathy and to study their electrocardiographic and echocardiographic profile, in view of a high prevalence of chronic heart failure and underlying dilated cardiomyopathy, and very few data are available on DCM [(3)].

MATERIALS & METHODS

This was a cross-sectional study conducted at Karpaga Vinayaga Institute of Medical sciences and research Centre, Madhurantagam, Chengalpattu. After obtaining Ethical committee approval the study was conducted. Aim and Objective is to analyze the association of the risk factors, clinical presentation in patients with Dilated cardiomyopathy to a tertiary care hospital of Chengalpattu District. Data was obtained by using the purposive sampling method. The case sheets of patients who visited the outpatient department of the Medicine and Cardiology Department during the year 2023, who had been confirmed to have dilated cardiomyopathy, and who did not have a history of COPD, radiation, malignancy, or drug abuse were included. As these excluded patients may have cardiac involvement due to the condition itself.

Sample Size Calculation: The proportion Dilated cardiomyopathy was reported as 0.666 by Dr.Visalakshi Boyilla et al. (2019), in the recent edition of the Journal of Dental and Medical Sciences. Based on this guide and assuming a 95% confidence interval, a 5% absolute precision value, and with the available population size of 55. The minimum required sample size will be 47 ~ 50.

Inclusion criteria*:* Diagnosed with Dilated Cardiomyopathy.

Exclusion criteria: COPD, history of radiation, malignancy and drug abuse.

Consent: After acquiring proper consent from the patient with the assurance of the confidentiality of the personal data being not misused. The information from the patients is collected.

Statistical Analysis: All the data were entered into a Microsoft Excel sheet and verified before analysis using SPSS 25. 0.. The observed study parameters are symptoms such as dyspnea, chest pain, ECG, Echo cardiogram and comorbidities. Continuous variable like age was expressed as mean and standard deviation. Categorical variables are gender, EF

preserved or reduced, dyspnea, chest pain and comorbidities. applied frequency and percentage. Inferential statistics was done using the chi-square test for categorical variables and asses

the risk factors with outcome parameters using logistic regression model. This "p-value" < 0.05 is significant at 5% level of confidence interval.

RESULTS

In our study population, 46.7% were females and 53.3% constituted the male population. Difference in age was statistically significant. Family history of DCM was seen among

5% of the population. Behavioral problems like drinking alcohol were seen amongst 38.33% of the subjects, and smoking among 31.6% of the population under study.

Table.1 The frequency table for ECG finding n = 60

ECG findings	Frequency	(%)
Left Bundle Branch Block	2	3.3
Left atrial enlargement	3	5
Right Bundle branch block	4	6.7
Ectopic	1	1.7
First degree AV block	1	1.7
Atrial Fibrillation	1	1.7
ST elevation	1	1.7
T wave inversion	1	1.7
Normal	46	76.6

Table.1, The ECG findings are 76.6% of the patients had normal study, meaning that the majority of the subjects composing this sample carried with them no important electrical abnormalities in cardiac activity. In any case, abnormal ECG findings included the following is RBBB was present in 6.7% of the patients, Left Atrial Enlargement was found in 5.0% of the patients, LBBB was found in 3.3% of the patients. Other positive Tertiary Findings included Ectopic beats, First-degree Atrio Ventricular block, Atrial fibrillation, ST elevation, and T-wave inversions occurring at a 1.7% rate each

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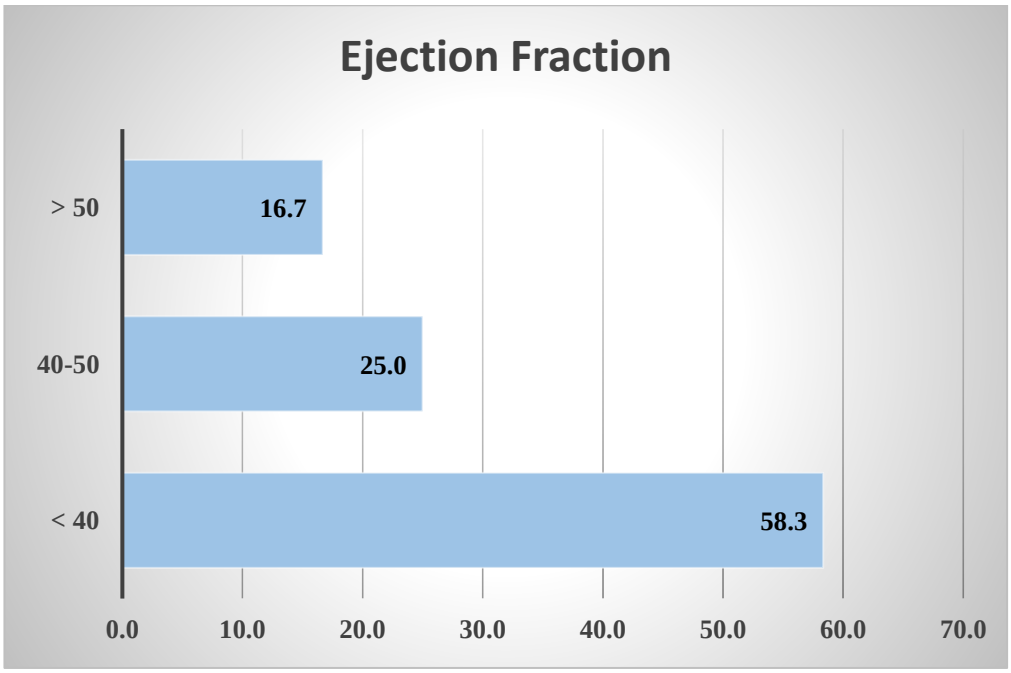

FIGURE 1

Table.2 Descriptive statistics for Echocardio-graphic Findings from study responded

Echo Findings	Frequency (n = 60)	%
EF Preserved		
Yes	8	13.3
No	52	86.7
LV Systolic dysfunction		
Yes	47	78.3
No	13	21.7
LV Diastolic dysfunction		
Yes	14	23.3
No	46	76.7
Mitral Regurgitation		
Mild	13	21.7
Moderate	10	16.7

Trivial	37	61.7
Tricuspid regurgitation		
Mild	12	20
Moderate	1	1.7
Severe	1	1.7
Trivial	46	76.6
Pericardial effusion		
Yes	4	6.7
No	56	93.3
Pulmonary Hypertension		
Mild	11	18.3
Moderate	4	6.7
Severe	4	6.7
No	41	68.3

Table.2, The echocardiograph shows that most of the patients in the study population have reduced ejection fraction and left ventricular systolic dysfunction. Only 13 % of the population have preserved Ejection Fraction. Associated mitral and tricuspid regurgitations are trivial. There is no or only mild mitral or tricuspid regurgitation. Pericardial effusion is very rare in the study population. Moderate to severe pulmonary hypertension is quite rare in this study population. The result indicates that systolic heart problems are common in the study group with lesser severe heart valve regurgitations and pulmonary hypertension.

Table.3 The association between symptoms of the patients with Ejection Fraction Preserved

Symptoms	**Ejection Fraction Preserved**		**"p-value"**
	No (n = 52) %	**Yes (n=8) %**	
Dyspnea			
No	6 (66.7)	3 (33.3)	**0.046**
Yes	46 (90.2)	5 (9.8)	
Chest pain			
No	25 (89.3)	3 (10.7)	
Yes	27 (84.8)	5 (15.6)	0.577
Syncope			
No	41(89.1)	5 (10.9)	0.309
Yes	11 (78.6)	3 (21.4)	
PND			
No	47 (88.7)	6 (11.3)	
Yes	5 (71.4)	2 (28.6)	0.207
Orthopnea			
No	46 (85.2)	8 (14.8)	0.311
Yes	6 (100)	0 (0)	

"p-value" < 0.05 is statitically significant.

Symptoms and its association with that of Echo graphic findings are tabulated in Table.3, The analysis reveals a relationship of reduced EF with dyspnea (90.2%), which means that patients who have dyspnea are more prone to have reduced EF. No evidence is found of a relationship in terms of ejection fraction status with chest pain, syncope, PND, and orthopnea. Thus, while dyspnea may be a strong marker for reduced EF, other symptoms does not appear statistically significant with EF status with these patients.

Table.4 Association of Risk Factors with Ejection Fraction

Risk factors	**Ejection Fraction Preserved**		**"p-value"**	**Odds Ratio**
	No (n = 52) %	**Yes (n=8) %**		
Alcohol				
No	32 (86.5)	5 (4.9)	0.958	**3.4**

Yes	20 (87.0)	3 (13.0)		
Smoking				
No	37 (90.2)	4(9.8)	0.231	0.2
Yes	15(78.9)	4 (21.1)		
Age				
< 50	15 (93.8)	1 (6.3)	0.572	
60-70	14 (77.8)	4 (22.2)		0.5
70-80	15 (88.2)	2 (11.8)		**2.2**
> 80	8 (88.9)	1 (11.1)		1.0
Gender				
Male	27 (51.9)	5 (62.5)	0.577	**1.5**
Female	25 (48.1)	3 (37.5)		
DM				
Yes	24 (46.2)	3 (37.5)	0.647	**1.4**
No	28 (53.2)	5(62.5)		

The association between Comorbidities and Ejection Fraction from the Table.4, The results indicates that all the study factors like alcohol consumption, smoking, age, gender, and diabetes mellitus show that there is no association between the comorbidities and reduced ejection fraction because the "p-value" is greater than 0.05 which is statistically not significant. All the study factors is not influencing the outcome of reduced ejection fraction.

Patients who consume alcohol has 3 times high risk than the non-alcoholic patients, Male patient and diabetic patients is considered to have slightly higher risk when compared to female and non-diabetics respectively. The age group of the patients 70-80 years have 2 times of risk compared to other age group patients. We found there is no association between the risk factors with the outcome factors of ejection fraction. So, we conclude "p-value" > 0.05 is not significant. The demographical, comorbidities and risk factors does not influence the outcome.

CONCLUSION

DCM is more common in age group between 60 and 70 years in our study. The most common clinical presentation of reduced ejection fraction was dyspnea (90.2%), followed by chest pain (84.8%). Diabetes was the more common co-morbidity associated and Alcohol consumption was the risk factor which was most commonly associated. Common abnormalities in ECG were right bundle branch block and left atrial enlargement. Echo cardiography revealed that ejection fraction was reduced among more than two-third of participants. There is a significant association between left ventricular dysfunction—both systolic and diastolic with ejection fraction. With this study we have concluded that the group of patients whom we studied has diabetic patients have higher risk when it is associated with increase in age.

DISCUSSION

Our study was done to understand the clinical profile and risk factors associated with dilated cardiomyopathy patients. The mean age of the participants was 60.12 ± 11.539 years. The mean age of male patients was 62 years, female participants were 56 years. Around 46.7% were females and 53.3% were male population. So, in our study the maximum patients are between age group 60 and 70. Family history of DCM was seen in 5% of the population. Behavioral problems like alcohol drinking were seen among 38.3% of the individuals and smoking among 31.6%, systemic hypertension was seen among 31.7% and 45% had a history of type II diabetes.

A study by Ahmad et al.,2005 shown the mean age of male participants was 52.9 years and for female participants 51.9 years [4]. According to Boyilla et al., 2019 56.7% were males and 43.3% were females, which is similar to our study [3]. The mean age of the participants was 41.2 years as shown by Singhal et al.,2019 [5].

A systematic review by Fundikira et al., 2022 reported the mean age of presentation was 52.5 based on 21 studies. From the same study, Hypertension was noted as the most common cardiovascular risk factor 53.4% along with obesity 20.65%, tobacco use 6.6%, and excessive alcohol intake 10%. Positive family history and black ethnicity were only recorded in 3 studies each at 4.0% and 97.3% respectively [6].

Dyspnea (85%) was the most common symptom reported. A similar report was also given by Ahmad et al.,2005 [4]. Dyspnea was the most common symptom reported by Boyilla et al.,2019 followed by that is easy fatiguability. However, in our study, easy fatiguability was seen only among 17% of the population probably due to variation in the presentation [3]. Mukhtar et al., also reported dyspnea as the most common symptom [7]. Dyspnea was reported by around 96% of the study participants as shown by Massumi et al, [8].

ECG findings of our study show normal rhythm among 98% of individuals. Left atrial enlargement was seen among 1.7% of the individuals while 25% had left atrial enlargement according to Ahmad et al.,2005 [4]. The most common abnormality reported was ventricular ectopic (46.6%) and only 13.3% had left atrial enlargement according to Boyilla et al., 2019 [3].

The mean ejection fraction was 41.15. About 8.3% had an ejection fraction between 20-29%. LV systolic dysfunction was seen in 78.3%. LV diastolic dysfunction was seen in 23.3% of individuals. Around 38.3% had an ejection fraction of less than 45. Tricuspid regurgitation was seen among 23.4%,

Mitral regurgitation among 38.4%, and pulmonary hypertension among 31.7%. Ahmad et al., reported pulmonary hypertension among 30%, tricuspid regurgitation among 47.3%, and mitral regurgitation among 63.6% [(4)]. Mean Ejection fraction was 30.87%. Forty percentage had an Ejection fraction between 20-29% according to Boyilla et al.,2019. All these differences could be due to variations at the stage of presentation [(3)]. According to Mukhtar et al., the Median ejection fraction was 31, and mitral regurgitation was seen among 87.3% [(7)]. The mean ejection fraction was 28 as shown by Singhal et al., probably due to the late stage of their presentation [(5)].

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