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Original research article

A study on clinical profile of patients with dilated cardiomyopathy at a tertiary care hospital

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Abstract

Dilated cardiomyopathy represents the final common pathway produced by a variety of ischemic, toxic, metabolic and immunological mechanisms damaging the heart muscle. Though the initial insult to the myocardium may vary, pathophysiology and clinical presentation are similar in all the varieties. The most common clinical presentation is congestive heart failure, usually left ventricular failure. Study protocol included detailed clinical history and their previous medical records, clinical examination and investigations. A detailed clinical workup incorporating details of age, presenting Complaints (dyspnea, palpitation, PND, orthopnea, pedal edema, chest pain, cough, easy fatigability, etc.) Diet, smoking, alcohol was done. The most common abnormality was sinus tachycardia seen in 50% of patients. Ectopic beats 40% and left bundle branch blocks were seen in 30% of subjects. Right bundle branch block was observed in 10%. Nonspecific ST-T changes were seen in 26% whereas atrial fibrillation was present in 9%. LVH was seen in 20% and left atrial enlargement in 14% of subjects.

Keywords: Dilated cardiomyopathy, sinus tachycardia, alcohol

Introduction

The term cardiomyopathy was first introduced in the year 1957 by Wallace Brigden of the National Heart Hospital, London to refer collectively a primary myocardial disease [1].

Cardiomyopathy is a primary disorder of the heart muscle that causes abnormal myocardial performance and is not the result of disease or dysfunction of other cardiac structures. The dominant feature is a direct involvement of the heart muscle itself. They are distinctive because they are not the result of pericardial, valvular, hypertensive or congenital diseases.

The natural history of DCM is not well established. Many patient have minimal or no symptoms and the progression of the disease is unpredictable. The long term prognosis is not good. Nevertheless, in symptomatic patients the course is usually one of progressive deterioration with up to 50% of patients with heart failure succumbing within a year. The annual mortality rate for a typical patient of DCM with heart failure is about 11 to 13percent [2].

The prevalence of heart failure is about 1 to 1.5% of the adult population. The mortality and morbidity remain high (median survival of 1.7 years for men and 3.2 years for women). Dilated cardiomyopathy is an important cause of heart failure and accounts for upto 25% of all cases of CHF. Whether the result of improved recognition or of other factor, the incidence and prevalence of heart failure due to cardiomyopathy appears to be increasing. The incidence of DCM is reported to be 5 to 8 cases per 1, 00,000 population per year. It occurs 3 times more frequently in males as compared to females. It is also

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more common in blacks [3].
The most widely used functional classification of cardiomyopathy recognizes 3 disturbance so function-dilatation, hypertrophy and restriction. Dilated cardiomyopathy is the most common form of dilated cardiomyopathy is the most common form of cardiomyopathy comprising over 90% of the cases. The most common dilated cardiomyopathy is the ischemic dilated cardiomyopathy followed by idiopathic/familial, diabetic and alcohol cardiomyopathy [4].
Dilated cardiomyopathy represents the final common pathway produced by a variety of ischemic, toxic, metabolic and immunological mechanisms damaging the heart muscle. Though the initial insult to the myocardium may vary, pathophysiology and clinical presentation are similar in all the varieties. The most common clinical presentation is congestive heart failure, usually left ventricular failure. The patient can also present with symptoms secondary to arrhythmias, stroke (embolic infarction) or sudden death [5, 6].

Methodology
Source of data
Subjects admitted with symptoms and signs of heart failure (Clinically suspected and echocardiography proven) over a period of two year.

Sample size: 100 participants.

Inclusion criteria
Clinical criteria
Patients with symptoms and signs of heart failure.

Echocardiography criteria
a) Left ventricular ejection fraction <45%.
b) Left ventricular end diastolic dimension >4.5cm body surface area.
c) Global hypokinesia.
d) Dilatation of all the chambers of heart.

Exclusion criteria
a) Valvular heart disease.
b) Congenital heart disease.
c) Pericardial disease.
d) Cor pulmonale with CHF.
e) Hypertrophic cardiomyopathy.
f) Restrictive cardiomyopathy.

Study protocol included detailed clinical history and their previous medical records, clinical examination and investigations. A detailed clinical workup incorporating details of age, presenting Complaints (dyspnea, palpitation, PND, orthopnea, pedal edema, chest pain, cough, easy fatigability, etc.) Diet, smoking, alcohol was done.
Physical examination of the patient included height, weight, BMI was calculated using the formula weight (kg)/height (m2). And Heart rate, BP, JVP, Murmur were noted. Blood pressure measurement is done with mercury sphygmomanometer at the time of admission Hypertension (BP>140/90), Hypotension (Systolic BP<90mmhg), Bradycardia (HR<60bpm), Tachycardia (HR>100), basal crepitation's, JVP, hepatomegaly, pedal edema, S3, murmurs, etc.
Investigations like echocardiography, chest radiography and electrocardiography. Other relevant investigations pertinent to certain cases like ischemic cardiomyopathy, diabetic cardiomyopathy, alcohol cardiomyopathy, etc. HbA1C, liver function tests, etc.
These patients were subjected to echocardiography, ECG and chest radiography. The echocardiographic criteria were based on the recommendations of the American society of echocardiography and American heart association.
The diagnosis of ischemic cardiomyopathy was based on either past history of myocardial infarction or coronary angiography showing significant luminal occlusion (>70%).
The diagnosis of diabetic cardiomyopathy was made in patients with long standing (>10 years) diabetes mellitus and in whom no other cause was obvious. Similarly patients with echocardiography proven dilated cardiomyopathy with history of long term (> 10 years) alcohol intake in whom no other causes

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were found were included as alcoholic cardiomyopathy.

Results

Table 1: Demographic profile

Age (yrs.)	Male	%	Female	%	Female
20	0	0	2	2	2
21-40	6	6	3	3	9
41-60	25	25	9	9	34
61-80	36	36	15	15	51
> 80	4	4	0	0	4
Total	71	71	29	29	100

Table no. 1 shows the demographic profile of patients with dilated cardiomyopathy. Majority of the patients were males comprised 71% and females comprising 29%. Among males and females the majority of cases were between the ages of 61-80 years.

Table 2: Symptom profile

Sl. No	Symptoms	No of cases	Percent
1.	Exertional dyspnea	98	98
2.	Paroxysmal nocturnal dyspnea	12	12
3.	Orthopnea	76	76
4.	Palpitation	15	15
5.	Chest pain	42	42
6.	Cough	28	28
7.	Abdominal pain	29	29
8.	Easy fatiguability	98	98
9.	Syncope	4	4
10.	Pedal edema	89	89

Table 2 shows the symptom profile of the patients. 98% of patients presented with exertional dyspnea and Easy fatigability were most common symptoms followed by pedal edema in 89% of patients. Orthopnea 76%, chest pain 42%, palpitation 15%, cough 28% and History of PND were seen in 12% of subjects followed by abdominal pain 19% and syncope 4%.

Table 3: Physical signs

Sl. No.	Physical signs	No of cases	Per cent
1.	Basal crepitation's	73	73
2.	Raised JVP	72	72
3.	Hepatomegaly	33	33
4.	LVS3	35	35
5.	RVS3	1	1
6.	Pan systolic murmur	27	27
7.	SBP <100	42	42
8.	Pedal edema	89	89

Table 3 shows Pedal edema was present in almost 89% of subjects; Basal crepitations were seen 73% of the subjects. Raised JVP was seen in 72% and. Systolic blood pressure < 100mm Hg was seen in 42%, LVS3 seen in 35%, hepatomegaly in 33%.
Apical pan systolic murmur was present in 27% and RVS3 was seen in 1% of our patients.

Table 4: Abnormalities of peripheral pulse

Sl. No	Pulse	No of cases	Per cent
1	Tachycardia	50	50.0
2	Ectopic beats	40	40.0
3	Atrial Fibrillation	9	9.0
4	Bradycardia	1	1.0

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Table 4 shows abnormalities of peripheral pulse included tachycardia, bradycardia, ectopic beats and atrial fibrillation. Tachycardia in 50%, ectopic beats was seen in 40% and atrial fibrillation in 9% of patients and Bradycardia 1%.

Table 5: Electrocardiographic profile

Parameters		**N**	**%**
QRS axis	Normal	80	80
	Left axis deviation	14	14
	Right axis deviation	6	6
Arrhythmia's	Sinus tachycardia	50	50
	Atrial ectopic	9	9
	Atrial fibrillation	9	9
	SVT	0	0
	Ventricular ectopic	40	40
	Ventricular tachycardia	0	0
	Complete heart block	1	1
	Left bundle branch block	30	30
	Right bundle branch block	10	10
ST-T changes		26	26
Atrial enlargement	LAE	14	14
	RAE	7	7
Ventricular Hypertrophy	LVH	20	20
	RVH	6	6
	Both	1	1

Table 5 shows the electrocardiographic profile included abnormalities of rate, rhythm, and axis and chamber enlargement. The most common abnormality was sinus tachycardia seen in 50% of patients. Ectopic beats 40% and left bundle branch blocks were seen in 30% of subjects. Right bundle branch block was observed in 10%. Nonspecific ST-T changes were seen in 26% whereas atrial fibrillation was present in 9%. LVH was seen in 20% and left atrial enlargement in 14% of subjects. Complete heart block was seen in only 1 patient (i.e.1%).
The axis was normal in majority 80%. Left axis deviation was seen in 14% and right axis deviation in 6%.

Table 6: Echocardiographic profile

Ejection fraction		**No of cases**	**Per cent**
	40-45%	8	8.0
	30-39%	58	58.0
	20-29%	32	32.0
	<20%	2	2.0
LVEDD			
	4.5-4.9	3	3.0
	5-5.9	36	36.0
	6	61	61.0
LVESD			
	3.5-4	8	8.0
	4-4.9	36	36.0
	5	56	56.0

Table 6 shows the mean LV ejection fraction was 30.24%. The left ventricular ejection fraction was less than 20% in 2% of patients. It was between 20-29% in 32%, between 30-39% in 58% of patients and between 40 to 45% in 8% of patients.
The mean LV end diastolic diameter was 6.09 cm with majority i.e.61% of subjects having LV end diastolic diameter more than 6 cm.
The mean LV end systolic diameter was 4.92cm with majority of patients 56% having end systolic diameter more than 5cm. Global hypokinesia and dilatation of all 4 chambers were seen in all the patients.

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Discussion

The present study aims to evaluate the clinical profile of patients with dilated cardiomyopathy. In our study, dilated cardiomyopathy was predominantly seen in the elderly population. Of the total 100 subjects, males comprised 71% and females 29%. In males, DCM was most commonly seen in the elderly (mean age 60.35±15 years). In females DCM was predominantly seen in middle age (60±20 years). The underlying etiology varied with the age group.

Ischemic dilated cardiomyopathy was the most common subtype in males while idiopathic and peripartum cardiomyopathy was the etiologies in females.

In one study [7] the mean age was 52.9±15.1 years in males and 51.3.9±17.7 years in females.

In another study [8] the mean age was 64.4 years in males and 55.5 years in females.

In a study [9] done in 2004, the mean age of presentation did 42.6±9.1 years with males comprise 73.6% and females comprising 26.4% of the study population?

Majority of the patients presented with biventricular failure. Exertional dyspnea and easy fatigability was the most common symptom being present in all our patients followed by pedal edema, abdominal pain, cough and palpitation. This presentation is similar to the clinical profile seen in other studies [7, 8, 9].

In our study upto 42% of patients had chest pain. This was high compared to other studies like S Ahmad *et al*., [7]. Where in chest pain was seen in 29%. This could be due to inclusion of patients with ischemic cardiomyopathy as compared to the other study where it was excluded.

In addition syncope was observed in up to 4% of our patients, where as in other studies syncope was seen in 1% S Ahmed *et al*., [10]. this high figure could again beat tribute to the inclusion of ischemic cardiomyopathy in our study. Arrhythmias and severe LV dysfunction being more commonly present in ischemic cardiomyopathy could lead to syncope. Of the 4 patients with syncope in our study 2 had ischemic DCM with Low LV ejection fraction of which one had complete heart block, one had atrial fibrillation.

Abnormalities of pulse rate and rhythm were the most consistent physical signs; basal crepitation's indicating biventricular failure was seen in 80% of our patients. These findings were similar to those of all other studies.

The QRS axis was normal in 80% of our subjects with left axis deviation in 14% and right axis deviation in 6% which were in concordance with all the other studies.

Sinus tachycardia was the most consistent finding in the S Ahmad *et al*., study being found in up to 69% of patients. Our study showed sinus tachycardia in 50% of patients. Other ECG parameters like ventricular ectopics, LBBB, Atrial fibrillation, atrial ectopics were comparable to those in all the other studies [7].

However RBBB, complete heart block was more commonly present in our study as compared to other studies. These could again be due to the inclusion of ischemic cardiomyopathy in our study.

LVH was less commonly seen in our study being present in 20% as compared to 30 to 40% other studies.

Nonspecific ST-T changes were seen in 26% of cases, similar to that in other studies.

Mitral regurgitation was seen in 22% of our patients comparable to that in other study groups. Mitral regurgitation 22% was more commonly seen compared to tricuspid regurgitation 5%.This was due to large proportion of patients with ischemic dilated cardiomyopathy and severe LV dysfunction compared to non-ischemic cardiomyopathy. None of our patients had AR compared to 17.8% of patients in Jain *et al*., [9]. Study. Mitral and tricuspid regurgitation in DCM are secondary to annular ring dilatation. Pericardial effusion was present in 6% of our patients.

Conclusion

- The most common clinical presentation is heart failure that is biventricular failure followed by left ventricular failure. The most common type is ischemic cardiomyopathy followed by diabetic, idiopathic, peripartum, and alcoholic cardiomyopathy.
- Chest radiograph showed cardiomegaly in most patients. The common abnormalities on ECG consist of sinus tachycardia, atrial fibrillation and left bundle branch block.
- Echocardiography revealed reduced ejection fraction and global hypokinesia universally. Mitral regurgitation and pericardial effusion were present in significant number of patients.

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