



## Dilated Cardiomyopathy: Aetiology, Clinical Presentation, ECG and Echo Cardiographic Evaluations Our Experience in a Tertiary Care Hospital

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### Abstract

**Background:** Dilated cardiomyopathy refers to a group of heterogenous myocardial disorders characterized by ventricular dilation and depressed myocardial contractility in the absence of abnormal loading conditions i.e. hypertension and valvular heart disease.

**Aims & Objectives:** To study the clinical profile ECG and echocardiographic abnormalities and to determine the aetiology of dilated cardiomyopathy.

**Study Design:** Prospective cross sectional observational study.

**Material & Methods:** Fifty newly diagnosed cases of dilated cardiomyopathy admitted to the department of cardiology of SCB Medical College, Cuttack over a period of one year from 01.04.2017 to 30.03.2018 were evaluated clinically and with ECG and echocardiography.

**Statistical Analysis:** Was done with percentage proportions, chi square test and corrections. The level of significance was set at  $P < 0.05$ .

**Results:** Dilated cardiomyopathy was more common in middle aged and elderly population. Males were more commonly affected than females. Dyspnea was the commonest symptom followed by fatigability. The most common ECG abnormality was sinus tachycardia followed by ventricular ectopic. Commonest presentation was ischaemic cardiomyopathy (40%) followed by idiopathic DCMP (28%), diabetic cardiomyopathy (20%) and peripartum cardiomyopathy (8%).

**Conclusion:** DCMP is a commonly encountered clinical entity in heart failure patients. Ischemic cardiomyopathy (ICMP) is the commonest among all DCMP patients followed by idiopathic dilated cardiomyopathy. Biventricular failure was the commonest presentation and commonest ECG abnormalities were sinus tachycardia and ventricular ectopics.

**Keywords:** Dilated cardiomyopathy (DCMP), ischemia cardiomyopathy (ICMP), left ventricular ejection fraction (LVEF).

## Introduction

Dilated cardiomyopathy includes a group of heterogenous myocardial disorders characterized by ventricular dilation and depressed myocardial contractility in the absence of abnormal loading conditions like hypertension and valvular heart disease. Dilated cardiomyopathy is the end results of myocardial dysfunction due to various aetiological causes like ischaemic insult, toxics, metabolic causes damaging the heart muscle directly. The protean manifestations of dilated cardiomyopathy are heart failure, arrhythmias, cardioembolic stroke and sudden death, the former being the commonest. Dilated cardiomyopathy accounts for 25% of all causes of heart failure. The incidence of DCMP is about 5-8 per 1 lakh population per year. Males are affected three times more commonly than females. The clinical characteristics and cardiomyopathy are well described.<sup>1-3</sup> however, the incidence, aetiology and prognosis of DCMP may differ among patients with different socioeconomic and geographic locations. The prevalence of DCMP in Japan is about half of the western population and in Africa and latin America it is twice as common as compared to the Western counterpart.<sup>1</sup> Symptomatic heart failures patients of DCMP have progressive deterioration with 50% succumbing within one year. Dilated cardiomyopathy is no more a diagnosis by exclusion in view of rapid advancement in investigation like molecular genetics.

## Aims & Objectives

The present study was undertaken to study the clinical presentation, electrocardiographic changes, echocardiographic parameters and to establish the etiology of dilated cardiomyopathy in patients of heart failure admitted to department of Cardiology of SCB Medical College & Hospital over a period of one year.

## Material & Methods

This is a prospective cross sectional observational study involving fifty (50) patients of dilated

cardiomyopathy admitted to department of Cardiology of SCB Medical College & Hospital, Cuttack, Odisha over a period of one year.

## Inclusion Criteria

- Symptoms of heart failure
- Left ventricular end diastolic dimension (LVEDD) > 3.0cm/m<sup>2</sup>
- Global hypokinesia of LV with/ without RV involvement
- LVEF <40%

## Exclusion Criteria

- Congenital heart disease
- Valvular heart disease
- Hypertension
- Pericardial disease

Total no. of 50 patients were taken for the present study. After admission to the hospital detailed clinical examination, routine blood investigations like FBS, Urea, Creatinine, Electrolytes, Liver function test, HbA1C were done. ECG, X-Ray chest PA view and Echocardiography were done.

## Results

In our study, total no of fifty patients of heart failure due to DCMP were included males were 32 in number and females 18 in number. The male: female ratio was 1.7:1 (Table I).

**Table-I:** Sex of Study Population

	Number	Percentage (%)
Male	32	64%
Females	18	36%

In our study, the commonest mode of presentation was breathlessness (100%) followed by fatiguability (80%). Other symptoms were PND (60%), orthopnoea (52%) and palpitation (44%) (Table II).

**Table-II:** Symptoms complex profile

Symptoms	Number	Percentage (%)
Dyspnoea	50	100%
Orthopnoea	26	52%
PND	30	60%
Fatiguability	40	80%
Pedal Oedema	32	64%
Chest Pain	18	36%
Palpitation	22	44%
Syncope	8	16%

Majority of patients were symptomatic NYHA class III (48%) and class IV (32%) (Table-III).

**Table- III**

NYHA Class	Number	Percentage
Class I	2	4%
Class II	8	16%
Class III	24	48%
Class IV	16	32%

Biventricular failure (76%) was most common followed by LVF (20%), only two (4%) patients presented with RV failure (Table-IV).

**Table-IV: Heart Failure**

Type of HF	Number	Percentage
Biventricular	38	76%
LVF	10	20%
RVF	2	4%

Chest radiography revealed cardiomegaly in all patients. Electrocardiography was abnormal in all fifty patients. Commonest ECG abnormality was sinus tachycardia (44%) followed by ventricular ectopics (40%) and LBBB (36%). Atrial fibrillation was presents in 20% of cases. Complete heart block (CHB) was percent only in one (2%) patient. Left ventricular hypertrophy (LVH) & Right ventricular hypertrophy (RVH) were presents in 15 (30%) & 4 (8%) cases respectively. Atrial enlargement like left atrial enlargement (LAE) & right atrial enlargement (RAE) were present in 16 (32%) & 5 (10%) cases respectively (Table-V).

**Table-V: ECG Characteristics**

Type	Number	Percentage
LAE	16	32%
RAE	5	10%
LVH	15	30%
RVH	4	8%
Both	2	4%
Sinus tachycardia	22	44%
Supraventricular ectopics	6	12%
Atrial fibrillation	10	20%
Ventricular ectopics	20	40%
Ventricular tachycardia	2	4%
CHB	1	2%
LBBB	18	36%
RBBB	8	16%

Echocardiography abnormalities like increased LV end diastolic dimension & reduced ejection fraction with presence of mitral regurgitation

(MR) were commonly found. The mean LVEDD was 5.48cm. Global hypokinesia was seen in all patients. The mean LVEF was 31.25% & LVEF of less than 20% was found in 4 (8%) patients (Table-VI).

**Table-VI: Echocardiographic abnormalities**

Parameter	Number	Percentage
LVEF 30-40%	26	52%
20-29%	20	40%
<20%	4	8%
LVEDD 4.5-4.9 (cm)	8	16%
5.0-5.9 (cm)	22	44%
>6.0 (cm)	20	40%
MR	40	80%
TR	10	20%
Pericardial effusion (PE)	6	12%

## Discussion

The present study was aimed at evaluation of clinical presentation, ECG and echocardiographic abnormalities and to determine the aetiology of dilated cardiomyopathy in fifty patients admitted to a tertiary care hospital of state of Odisha. In our study the mean age of presentation in males and females were  $55.58 \pm 14.89$  years and  $40.5 \pm 18.75$  years respectively. In our study breathlessness (100%) was the most common symptoms. Majority of there were symptomatic NYHA class III (48%) & class IV (32%). Similarly orthopnoea & PND were seen in 52% & 60% of patients. Fatiguability and pedal oedema were present in 80% & 64% of patients respectively. This is agreement with the study done by Singh G et al<sup>4</sup> and Jain A et al<sup>5</sup>. In our study the commonest ECG findings was sinus tachycardia similar to study by S. Ahmed et al<sup>6</sup>. LVH was present in 30% of patients in our study which is similar to other studies. Chest radiography showed cardiomegaly in all patients which is similar in study by Mausmi et al<sup>7</sup>. Echocardiographically the mean LVEF of 31.25% in our study was similar to that of Divakar et al<sup>5</sup>. The mean LV end diastolic and systolic diameter. In our study were similar to other studies. The incidence of MR (80%) as compared TR (20%) was more common in our study as ischaemic cardiomyopathy was the common cause of DCM in our study population.

### Conclusion

Dilated cardiomyopathy is the commonest cardiomyopathy & is an important cause of heart failure in day to day clinical practice. It is commonly seen in middle aged & elderly population through all age group individuals are prone to suffer from this. Peripartum cardiomyopathy is commonly seen in young age and various aetiological agents also do cause cardiomyopathy in young population. Ischaemic cardiomyopathy was more common in males where in diabetic and idiopathic DCM were more common in females. ECG abnormalities like sinus tachycardia, LBBB, AF and LAE in sinus rhythm in patients of heart failure of short duration i.e. few days to weeks gives a clinical clue to the diagnosis of dilated cardiomyopathy. Echocardiography establishes the diagnosis by showing global hypokinesia of dilated left ventricle with or without RV dilation with grossly reduced systolic function. Other echocardiographic findings like LAE, MR, TR, pericardial effusion may be present. Hence, a diligent clinical history, physical examination, ECG changes & finally echocardiography establishes the diagnosis of dilated cardiomyopathy in patients of heart failure. Further work up with advanced technology is likely to establish the aetiology of cardiomyopathy.

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