



CLINICAL AND ECHOCARDIOGRAPHIC CHARACTERISTICS OF PATIENTS WITH DILATED CARDIOMYOPATHY: A RETROSPECTIVE CROSS-SECTIONAL STUDY

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ABSTRACT

Dilated cardiomyopathy (DCM) remains a major contributor to heart failure and represents a significant source of cardiovascular morbidity in India. Despite its clinical importance, detailed descriptions of the demographic and clinical characteristics of affected Indian patients are still relatively limited. The present investigation sought to clarify the demographic profile, biochemical alterations, and echocardiographic patterns observed among individuals diagnosed with dilated cardiomyopathy at a tertiary care centre in Pune. Medical records spanning the years 2016 to 2020 were reviewed, yielding a cohort of 165 patients with confirmed dilated cardiomyopathy and left ventricular ejection fraction below 40%. Demographic information, laboratory biomarkers, and echocardiographic findings were extracted and evaluated. Continuous variables are reported as mean $\pm$ SEM, and statistical significance was defined as $p \leq 0.05$. The patient group consisted of 109 males and 56 females, with a mean age close to 51 years. Cardiac biomarkers differed by sex, with males demonstrating significantly higher serum concentrations of CPK, CPK-MB, and creatinine. Echocardiographic assessment frequently revealed global hypokinesia accompanied by varying degrees of systolic dysfunction. Valvular abnormalities, particularly mitral and tricuspid regurgitation, were also commonly documented. Taken together, these observations suggest that dilated cardiomyopathy within this cohort predominantly affects middle-aged men and is frequently accompanied by elevated cardiac injury markers and pronounced echocardiographic abnormalities at the time of clinical recognition.

KEYWORDS: Dilated cardiomyopathy, echocardiography, cardiac biomarkers, India

INTRODUCTION

Dilated cardiomyopathy (DCM) is a myocardial condition defined by enlargement of the ventricular chambers together with impaired systolic performance, ultimately progressing toward symptomatic heart failure (Elliott et al., 2008). Among non-ischemic cardiomyopathies, it is one of the most frequently encountered forms worldwide, with estimated prevalence rates generally ranging between 1:250 and 1:500 individuals (McKenna, Maron and Thiene, 2017).

In many developing regions, including India, the clinical burden associated with cardiomyopathy-related heart failure appears to be rising. Improvements in diagnostic imaging and expanding awareness of cardiovascular disease have likely contributed to increased recognition of the condition (Chaturvedi et al., 2016). Even so, comprehensive clinical descriptions of dilated cardiomyopathy within the Indian population remain comparatively scarce. Reports from regional studies suggest that demographic patterns, clinical severity, and presentation may not entirely mirror those documented in Western populations (Mishra and Mohanty, 2021). Biochemical indicators of myocardial injury provide additional insight into disease activity. Enzymes such as

creatine phosphokinase (CPK) and its myocardial isoenzyme CPK-MB are widely used to reflect cardiomyocyte damage and may offer indirect information regarding the extent of myocardial involvement (Thygesen et al., 2018). Alongside these laboratory markers, echocardiography continues to serve as the cornerstone imaging modality for evaluating ventricular size, wall motion abnormalities, and systolic function in patients suspected of cardiomyopathy (Lang et al., 2015). A clearer understanding of the clinical and echocardiographic profile of patients with dilated cardiomyopathy may support earlier recognition and more effective clinical management. With this perspective in mind, we sought to characterize the demographic distribution, biochemical profile, and echocardiographic findings observed in patients diagnosed with dilated cardiomyopathy at a tertiary care hospital in Pune, India.

MATERIALS AND METHODS

Study design and setting: Patient records from the Department of Cardiology at Bharati Hospital, Pune were reviewed to examine cases of dilated cardiomyopathy diagnosed between January 2016 and December 2020. The investigation followed a retrospective cross-sectional design, allowing clinical and diagnostic characteristics recorded during routine care to be evaluated.

Ethical approval: Prior to data extraction, institutional clearance was obtained from the Human Ethics Committee of Bharati Vidyapeeth Deemed to be University Medical College. The study adhered to the ethical standards governing clinical research involving human subjects.

Data collection: Clinical documentation maintained by the hospital Medical Record Department served as the primary data source. Information relating to demographic variables, biochemical investigations, and echocardiographic assessments was systematically retrieved and compiled using structured data sheets to ensure uniform recording of patient characteristics.

Inclusion criteria: Individuals aged 18 years or older with a diagnosis of non-ischemic dilated cardiomyopathy and documented left ventricular ejection fraction below 40% were considered eligible for evaluation.

Exclusion criteria: Patients with conditions that could independently influence cardiac structure or function were not considered for analysis. These included coronary artery disease, prior myocardial infarction, primary valvular heart disease, active infection, malignancy, or end-stage renal failure.

Statistical analysis: Statistical evaluation was performed using PAST version 3 software. Continuous variables are expressed as mean $\pm$ SEM. Comparisons between male and female patients were carried out using the independent *t*-test, with $p \leq 0.05$ regarded as indicating statistical significance.

RESULTS

Demographic characteristics

Review of the clinical records identified 165 individuals with dilated cardiomyopathy who fulfilled the study criteria. Within this cohort, 109 patients were male and 56 were female. The overall mean age was close to 51 years, suggesting that the condition in this population predominantly affects middle-aged adults.

Clinical and Biochemical Parameters

Table 1 summarises the principal clinical and biochemical measurements observed in the study population. Blood pressure values tended to be marginally higher in males; however, these differences did not reach statistical significance. Biochemical markers showed clearer variation between sexes. Serum CPK, CPK-MB, and creatinine concentrations were significantly greater in male patients than in females. Although serum alkaline phosphatase also differed significantly between groups, the measured values remained within the normal physiological range. In contrast, triglyceride levels fell within the expected reference range and displayed no meaningful difference between the two groups.

Table 1. Clinical and Biochemical Parameters of DCM Patients

Parameter	Male (n=109) Mean $\pm$ SEM	Female (n=56) Mean $\pm$ SEM	p-value	Normal Range
Age (years)	50.79 $\pm$ 1.90	51.05 $\pm$ 2.18	0.78	—
Systolic BP (mmHg)	131.75 $\pm$ 9.97	129.52 $\pm$ 8.10	0.42	120
Diastolic BP (mmHg)	87.21 $\pm$ 1.19	84.84 $\pm$ 1.28	0.18	80
S. Alkaline Phosphatase (IU/L)	77.4 $\pm$ 5.4	70.56 $\pm$ 4.9	0.04	40–140
Serum CPK (mcg/L)	195.05 $\pm$ 4.58	183.16 $\pm$ 5.60	0.03	10–120
Serum CPK-MB (IU/L)	54.97 $\pm$ 1.30	49.60 $\pm$ 1.67	0.02	5–25
Serum Creatinine (mg/dL)	1.62 $\pm$ 0.19	1.52 $\pm$ 0.17	0.04	0.74–1.35
Triglycerides (mg/dL)	116.12 $\pm$ 4.08	110.25 $\pm$ 5.30	0.38	100–150

Echocardiographic Findings

Structural and functional cardiac changes observed on echocardiography are summarised in **Table 2**. Global hypokinesia emerged as the most frequent abnormality, affecting a large proportion of patients. Assessment of ventricular function showed that severe systolic dysfunction was most common, while moderate and mild impairment occurred less frequently. Valve involvement was also notable, with mitral regurgitation and tricuspid regurgitation identified in many patients, reflecting the haemodynamic consequences of ventricular dilation. Conduction abnormalities appeared in a smaller subset of the cohort.

Table 2. Echocardiographic Parameters in DCM Patients

Parameter	Male (n=109) n (%)	Female (n=56) n (%)	Total (%)
Global Hypokinesia	85 (77.98)	41 (73.21)	126 (76.36)
Mild Systolic Dysfunction	15 (13.76)	9 (16.07)	24 (14.54)
Moderate Systolic Dysfunction	42 (38.53)	18 (32.14)	60 (36.36)
Severe Systolic Dysfunction	52 (47.70)	29 (51.78)	81 (49.09)
Mitral Regurgitation	78 (71.56)	47 (83.93)	125 (75.76)
Tricuspid Regurgitation	94 (86.24)	48 (85.71)	142 (86.06)
Conduction Abnormalities	20 (18.35)	11 (19.64)	31 (18.79)

DISCUSSION

Analysis of patients diagnosed with dilated cardiomyopathy at a tertiary care centre in Western India revealed several noteworthy clinical patterns. Male patients formed the majority of the study cohort, a distribution that broadly aligns with observations reported in previous investigations of cardiomyopathy populations (Halliday et al., 2018; Meyer et al., 2014). Biochemical findings provide further insight into the disease process. Elevated concentrations of CPK and CPK-MB suggest ongoing myocardial injury, consistent with the role of these enzymes as markers of cardiomyocyte damage (Thygesen et al., 2018). In addition, serum creatinine levels were modestly increased, possibly reflecting renal involvement frequently observed in chronic heart failure through mechanisms related to cardiorenal interaction (Ronco et al., 2010). Echocardiographic evaluation revealed pronounced structural and functional abnormalities in many patients. Global hypokinesia and severe systolic dysfunction were particularly common, indicating advanced impairment of ventricular contractility at the time of clinical presentation. Comparable echocardiographic features have been documented in earlier descriptions of dilated cardiomyopathy (Lang et al., 2015; Weintraub, Semsarian and Macdonald, 2017). Another notable observation was the high prevalence of mitral and tricuspid regurgitation. Such valvular abnormalities are frequently secondary to ventricular dilation and altered geometry of the cardiac chambers, which disrupt normal valve coaptation (Asgar, Mack and Stone, 2015).

CONCLUSION

Findings from this cohort suggest that dilated cardiomyopathy within the studied population predominantly affects middle-aged men and is often accompanied by elevated cardiac biomarkers and marked echocardiographic abnormalities. Early recognition of these clinical features may assist clinicians in identifying patients at risk of progressive cardiac dysfunction and may support more timely therapeutic intervention.

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