

Echocardiographic Profile of Patients with Cardiomyopathy

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ABSTRACT:

Introduction: Cardiomyopathies represent a heterogeneous group of diseases that often lead to progressive heart failure with significant morbidity and mortality. Exact epidemiological data on cardiomyopathy in Nepal are lacking. This study was done to observe the demographic and echocardiographic profile of patients with cardiomyopathy attending a medical college teaching hospital. **Methods:** Trans-thoracic two-dimensional echocardiographic study was performed by first author on all patients with cardiomyopathy over a period of six months. Patients' demographic and echocardiographic data were collected and analyzed using SPSS version 20 software. Student t-test and Chi-square test were applied where appropriate. **Results:** A total of 60 patients were studied from October 2017 to March 2018. Mean age of all participants was 56.38 years (SD = 13.86). Mean age of males was significantly higher than that of females (60.96 yrs, SD = 13.61 versus 51.62 yrs, SD = 13.47) in dilated cardiomyopathy subgroup ($p < 0.05$). Of all patients, 32 (53.33%) had dilated cardiomyopathy (idiopathic) and 13 (21.66%) had ischemic cardiomyopathy. **Conclusion:** Our study highlighted significant burden of dilated cardiomyopathy. Dilated cardiomyopathy appeared in females at earlier age compared to males. Potentially reversible cardiomyopathies like alcoholic and peripartum cardiomyopathies were also present which have a probability of cure if treated properly.

Keywords: alcoholic cardiomyopathy, dilated cardiomyopathy, echocardiography, ischemic cardiomyopathy

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INTRODUCTION:

Cardiomyopathy is a heterogeneous group of myocardial disorders associated with mechanical and/or electrical dysfunction that causes abnormal myocardial performance.[1] Cardiomyopathies either are confined to the heart or are part of systemic disease conditions often leading to progressive heart failure.[2] Within this broad definition, cardiomyopathies usually are associated with failure of myocardial performance, which may be mechanical or electrical prone to life-threatening arrhythmias. [3] The worldwide prevalence and incidence rate of heart failure related to cardiomyopathies are approaching epidemic proportion.[4] The primary cardiomyopathy group have dilated, restrictive and hypertrophic phenotypes. The secondary cardiomyopathies are those associated with known cardiac or systemic processes. These are referred to as specific cardiomyopathies named for the disease process with which they are associated.[5] Dilated Cardiomyopathy (DCM) is considered to be an important cause of heart failure and accounts for up to 25% of all cases of congestive heart failure (CHF). [6] Out of all these, DCM is the most common form

comprising over 90% of all cases causing sudden cardiac death.[7] The Framingham study has also reported 10% annual mortality rate for subjects having CHF.[8]

Exact epidemiological data on cardiomyopathy in Nepal are lacking. Because of the high prevalence of chronic heart failure in the country and the increasing use of echocardiography, the incidence of cardiomyopathy is increasing. The present study was undertaken to analyze etiological and echocardiographic findings in patients with cardiomyopathy attending a medical college teaching hospital.

METHODS:

This was an observational study conducted over a period of six months (July 2017 to December 2017) at Lumbini Medical College Teaching Hospital (LMCTH), Palpa. Ethical clearance for the study was taken from Institutional Review Committee of the institute.

Inclusion criteria:

- Patients with cardiomyopathy
- Aged more than 15 years
- Undergoing echocardiogram

Exclusion criteria:

- Not consenting to the study

Admitted patients or those visiting the Cardiology Unit of Outpatient wing of Department of Internal Medicine were studied.

Proforma included demographic profile, clinical parameters, laboratory investigations, and echocardiographic findings. Transthoracic two-dimensional echocardiographic study was performed in accordance with the standard guidelines.

Echocardiography technique:

All patients were evaluated using M-mode and two-dimensional transthoracic echocardiography and color flow doppler examination using Siemens ACUSON. The guidelines of American Society of Echocardiography were followed in obtaining measurements.[9]

Systolic dysfunction was characterized by reduced ejection fraction (EF) <55%. Diastolic dysfunction was calculated by measuring E and A velocity across trans-mitral inflow velocity and

tissue doppler imaging. Diastolic dysfunction was characterized by (a) reduced early diastolic filling, (b) prolonged isovolumetric relaxation time, (c) increased atrial filling, (d) increased pre-ejection time and (e) reduced left ventricular ejection time. Left ventricular hypertrophy (LVH) was defined by left ventricular posterior wall (LVPW) >10 mm and inter-ventricular septum (IVS) >10 mm by M-mode. DCM was labeled if enlarged left ventricle with decreased systolic function was present as measured by left ventricular ejection fraction (LVEF); excluding ischemic, valvular, hypertensive or congenital causes. Ischemic cardiomyopathy was labeled on the basis of documented history of previous myocardial infarction or acute coronary syndrome. HCM was defined by a thickened but nondilated left ventricle in the absence of another cardiac or systemic condition such as aortic valve stenosis, systemic hypertension. HOCM was defined by thickened and nondilated left ventricle in the absence of other causes, such as hypertension or valve disease, with LVOT obstructive gradient more than 30 mm of Hg at rest. Peripartum cardiomyopathy was characterized by features of DCM was present with onset in the last month of pregnancy or in the first five months after delivery. Alcohol associated cardiomyopathy was labeled if features of DCM was present in patient with chronic alcoholism potentially reversible with abstinence from alcohol use.

Statistical analysis:

Statistical analysis of data was done using Statistical Package for Social Sciences (SPSS) version 20 software. All results were presented as frequency and percentages, and mean and Standard Deviation (SD). Two means were compared with unpaired t-test. Categorical variables were analyzed with Chi-square or Fisher exact test. A p value of less than 0.05 was considered significant.

RESULTS:

A total of 60 patients with diagnosis of cardiomyopathy were included in the study. Mean age was 56.38 years (SD = 13.86). Out of 60 patients, 34 (56.66%) were males with mean age of 61.11 years (SD = 11.36) and 26 (43.33%) were females with mean age of 52.79 years (SD = 16.28). There was significant statistical difference between genders in DCM subgroup (p < 0.05). Baseline characteristics of the patients is shown in Table 1.

Table 1: Baseline characteristics of patients with cardiomyopathy

Variables	n (%)	Mean age in years (SD)		P
		Male	Female	
Total population	60 (100%)	61.11 (11.36)	52.79 (16.28)	
Dilated cardiomyopathy	32 (53.33%)	60.96 (13.61)	51.62 (13.47)	<0.05
Ischemic cardiomyopathy	13 (21.66%)	67.91 (12.89)	66.25 (11.46)	0.6
Alcoholic cardiomyopathy	9 (15%)	52.32 (5.76)	N/A	
Hypertrophic cardiomyopathy	2 (3.33%)	49.33 (8.13)	N/A	
Hypertrophic obstructive cardiomyopathy	1 (1.66%)	44	N/A	
Peripartum cardiomyopathy	3 (5.0%)	34.15 (6.24)	N/A	

Out of the total 60 patients with cardiomyopathy studied; 32 (53.33%) had idiopathic, 13 (21.66%) had ischemic cardiomyopathy. A total of 9 (15.0%) patients had alcoholic cardiomyopathy, 3 (5.0%) had peripartum cardiomyopathy (PPCM), 2 (3.33%) had HCM, 1 (1.66%) had HOCM. In this study DCM was the most common cardiomyopathy (Table 1).

Out of 32 patients diagnosed with DCM, 19 (59.37%) were males and 9 (40.62%) were females. Out of 13 patients diagnosed with ischemic cardiomyopathy, 8 (61.53%) were males and 5 (38.46%) were females. Out of 3 patients diagnosed with HCM, all (100%) were males. There were 3 female patients who were diagnosed with PPCM. All the 9 patient diagnosed with cardiomyopathy secondary to chronic alcohol consumption were males.

Out of 32 patients with DCM, 20 (62.5%) had

diastolic dysfunction (DD) as well, by echo criteria. Total of 13 (100%) of ischemic cardiomyopathy, 100% of HCM and HOCM, 11.11% of alcoholic cardiomyopathy patients had diastolic dysfunction. None of the patients with PPCM had diastolic dysfunction.

Total three (9.37%) out of 32 patients with DCM had left ventricular (LV) clot and 1 (3.12%) patient had echo-contrast in LA/LV. The presence of LV clot in patients with DCM was significant statistically ($p < 0.05$). Out of 32 patients with DCM, 26 (81.25%) patients had mitral regurgitation and 21 (65.62%) patients had tricuspid regurgitation ($p < 0.05$) (Table 2).

DISCUSSION:

We compared the results of this study with various other studies. The DCM is frequently caused by coronary artery disease (CAD) and hypertension. [10] DCM most commonly occurs in middle age. [11] In our study, mean age of patients with DCM was 60.96 ± 61 years in male and 51.62 ± 13.47 years in female. In another study by Ahmad S et al, [12] the mean age was 51.39 ± 17.7 years.

In a study by Pacheco OE et al, [13] ischemic cardiomyopathy was identified as the most common cause of DCM, representing 37% of the patient and 22% had idiopathic etiology. In contrast to it, idiopathic was most common (53.33%) and next to it was ischemic cardiomyopathy (21.66%). The incidence rate of six per hundred thousand person per year was reported in ischemic cardiomyopathy by MB Cod et al. [14]

Of the 60 patients, 3 (5%) had peripartum cardiomyopathy. The mean age was 34.15 ± 6.24 years in our study. PPCM has been reported mostly in women older 30 years. [15]

The incidence of peripartum cardiomyopathy

Table 2: Echocardiographic findings in patients with cardiomyopathy

Types of cardiomyopathy (n)	LVEF (\pm SD)%	DD (%)	Clot (%)	Echo-contrast (%)	MR (%)	TR (%)
Dilated cardiomyopathy (32)	28 (± 7.7)	20 (62.5)	3 (9.37)*	1 (3.12)	26 (81.25)	21 (65.62)*
Ischemic cardiomyopathy (13)	36 (± 9.5)	13 (100)	0 (0)	0 (0)	8 (61.53)	3 (23.07)
Alcoholic cardiomyopathy (9)	39 (± 8.2)	1 (11.11)	0 (0)	0 (0)	2 (22.22)	4 (44.44)
Hypertrophic cardiomyopathy (2)	66 (± 12.5)	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)
Hypertrophic obstructive Cardiomyopathy (1)	71 (± 11.3)	1 (100)	0 (0)	0 (0)	1 (100)	0 (0)
Post-partum cardiomyopathy (3)	34 (± 8.7)	0 (0)	0 (0)	0 (0)	0 (0)	1 (33.33)

* p-value < 0.05

is reported to be 1 in 4000 pregnancies.[16] In a study in Pakistan, peripartum cardiomyopathy was reported to be 1 in 837 deliveries.[17] In our institution, 3 (5%) patients with cardiomyopathy, out of 60 study population, were admitted due to decompensated left heart failure. None of the patients with PPCM had diastolic dysfunction, LV clot and valvular regurgitation.

We also noticed complications of cardiomyopathies on echocardiographic study. Most common complications were intra-cardiac thrombi in 9.37%, spontaneous echo-contrast in 3.12%, mitral regurgitation in 81.25%, tricuspid regurgitation in 65.62%.

In the present study, total 3 (5.0%) had HCM, 1 (1.66%) had HOCM. 5% HCM in our study that included the clinical cases in our hospital, seems much less compared to the study by Phadke R S et al, who reported 13.9% among the autopsy cases. [18]

Excess alcohol intake may be manifested by features of DCM. The incidence of alcoholic cardiomyopathy has been reported to be 21% to 32% of DCM.[19] It more commonly occurs in male.[20] We had 15% of DCM presenting with ACM. All patients were male in our study.

CONCLUSION:

Present study highlights significant burden of idiopathic dilated cardiomyopathy and next to it was ischemic cardiomyopathy. Dilated cardiomyopathy appeared earlier in females as compared to males ($p < 0.05$). A total of 12 (20%) patients had potentially reversible cardiomyopathy like peripartum and alcoholic cardiomyopathy. The presence of LV clot and tricuspid regurgitation were significantly higher ($p < 0.05$) in patients with dilated cardiomyopathy.

Conflict of interest:

None declared.

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