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RESEARCH ARTICLE

CLINICAL, ELECTROCARDIOGRAPHIC AND ECHOCARDIOGRAPHIC PROFILE OF ADULT PATIENTS WITH DILATED CARDIOMYOPATHY PRESENTING TO A TERTIARY CARE HOSPITAL

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Abstract: ***Background AND OBJECTIVES*** Despite extensive research over many years, Dilated Cardiomyopathy continues to pose a serious global health concern. The annual incidence that is reported varies from 5-8 incidences per 100,000 people. However, because some asymptomatic patients go undiagnosed, the true incidence is likely underestimated. In order to describe the electrocardiographic and echocardiographic profiles of patients with dilated cardiomyopathy as well as their clinical profile, this study was conducted. ***METHODS*** The study comprised patients who met the criteria for Dilated Cardiomyopathy based on their echocardiographic results and who were either admitted or visited the outpatient department of medicine. A thorough history of the patient was obtained, and a clinical examination was carried out. A chest X-ray and 12-lead ECG were acquired. To evaluate chamber size, ejection fraction, and global hypokinesia, the echocardiogram was evaluated. ***RESULTS*** In this study 114 participants were enrolled, 35 were females and 79 were males. Peak incidence was above 60 yrs of age. Mean age was 58.5± 14.1yrs (mean±SD). The most common symptomatology was dyspnoea (96.5%). Other common symptoms observed were easy fatigability (59.6 %), pedal edema (54.4%) and PND(52.6%). Past history of myocardial infarction was present in 60.5% of the patients, 36% of the had h/o alcohol consumption. Diabetes mellitus was present in 48.2%. The most common pulse abnormality was tachycardia. The most common clinical finding present on physical examination was basal crackles, followed by pedal edema, raised JVP, apical pansystolic murmur, LVS3 and a pan systolic murmur in tricuspid area. The most common chest x ray finding was cardiomegaly and the ECG finding was ST- T changes. ECHO showed Mean EF 8.04±6.2%(Mean±SD). ***CONCLUSION*** In our study dilated cardiomyopathy more common elderly population and it is more common in males.Most common symptom was breathlessness. Ischaemic dilated cardiomyopathy, accounting for 60.50 percent of all cardiomyopathies, was the most prevalent kind of dilated cardiomyopathy in the study population. Alcohol was the next most common cause (15.9%). Idiopathic dilated cardiomyopathy was present in 15.9% of the study population.

Keywords: Dilated Cardiomyopathy, Congestive heart failure, Idiopathic DCM, Biventricular failure

INTRODUCTION

Cardiomyopathies are a significant and heterogeneous group of diseases. Understanding them has been challenging for us due to confusing definitions and terminology. . In India, estimates range from 1.3 million to 22.7 million cases of heart failure per year, with an annual incidence of 0.5 to 1.8 million[1]. Each year in the US, DCM causes 46,000 hospital admissions and 10,000 fatalities[2, 3,4]. Due to the fact that many patients are asymptomatic in spite of having LV dysfunction, these numbers might not accurately reflect the true prevalence. A wide spectrum of etiologies, many of which are genetic, give rise to cardiomyopathies. The natural history of cardiomyopathy is greatly influenced by its underlying aetiology, which emphasises the importance of conducting a comprehensive search for causes. Certain cardiomyopathies, such amyloidosis and HIV-related cardiomyopathy, are linked to poor prognoses, but other cardiomyopathies have good long-term survival rates [5, 6]. Determining the precise aetiology is essential to comprehending and successfully treating the illness. As an outcome of developments in molecular genetics and an understanding of underlying aetiologies, dilated cardiomyopathy, or DCM, is becoming more widely accepted as a specific diagnosis as opposed to an exclusionary one. DCM is still the most frequent reason for heart transplantation in the West[7,8].

Despite many years of research, DCM continues to be a serious and challenging problem for physicians around the world. In view of increasing prevalence of heart failure and lack of data, there is limited literature regarding the prevalence e and etiological factors of

DCM in South India, hence this study is being conducted to analyse the clinical profile of patients with Dilated cardiomyopathy.

OBJECTIVE

To study the clinical,electrocardiographic and echocardiographic profile of adult patients with Dilated Cardiomyopathy.

MATERIAL AND METHODS

SOURCE OF DATA:

In this cross sectional study patients who visited the Out Patient Department or admitted in St. John's Medical College hospital Bangalore, whose echochocardiography meets the criteria for dilated cardiomyopathy were included in the study. .The study was done over a period of 18months.

METHOD OF COLLECTION OF DATA

- Institutional Ethical Committee clearance was obtained prior to the start of the study. All patients with diagnosis of Cardiomyopathy who were under follow-up or newly diagnosed patients were included
- In patients whose echo showing dilated cardiomyopathy, an extensive history was taken and symptoms were analysed. Clinical examination was also done in detail.
- In all patients Ejection fraction, chamber dimension, global hypokinesia were assessed in Echocardiogram and the results were analysed.
- A 12 lead ECG was taken and interpreted. A chest radiograph which comprises of a postero-anterior chest film was also obtained.
- The diagnosis of ischemic Dilated cardiomyopathy was made based on either past history of myocardial infarction or the identification of luminal blockage of more than 70% during coronary angiography.
- The diagnosis of peripartum Cardiomyopathy was made based on the Criteria established by Demakis et al, which encompass 1) Development of heart failure in the last month of pregnancy or within 5 months of delivery (2) absence of identifiable heart disease prior to the last month of pregnancy. (3) Echocardiogram demonstrates classical left ventricular dysfunction (4) Absence of other identifiable causes of heart failure.
- In Patients with diabetes mellitus that is long standing (>10 years) and in whom no other obvious causes were present the diagnosis of diabetic cardiomyopathy was made
- Patients who have been consuming alcohol for more than 5 years, with a daily intake of more than 80 grammes (equivalent to 1L of wine, eight standard sized beers, or one-half pint of hard liquor), and have been diagnosed with dilated cardiomyopathy through echocardiography, are classified as having alcoholic cardiomyopathy if no other causes are identified.
- • If no discernible aetiology was identified, they were classified as idiopathic Dilated cardiomyopathy.
- The clinical profile, along with the likely cause, echocardiographic, radiological, and electrocardiographic results, were summarised.

INCLUSION CRITERIA

1. ECHO CRITERIA
    - Left ventricular ejection fraction <45%
    - Global hypokinesia of Left Ventricle
    - Dilatation of the chambers of the heart
    - Left ventricular end diastolic diameter >2.7 cm/M^2 body surface area.
    - Age more than 18 years

EXCLUSION CRITERIA

1. Congenital Heart Disease
2. Valvular Heart Disease

SAMPLE SIZE OF ESTIMATION

Sample size (114) was calculated based on the study of Rana et.al [9], *'Clinical profile of Dilated cardiomyopathy patients presenting to a tertiary care hospital from central Gujarat*'. The prevalence of breathlessness in patients with Dilated Cardiomyopathy was 95%. Hence to clinical profile of Dilated Cardiomyopathy with an absolute precision of 4% and 95% confidence interval the required minimum sample size is 114 Dilated Cardiomyopathy patients.

Single proportion – Absolute precision	
Expected proportion	0.95
Precision (%)	4
Desired Confidence level (1-alpha) %	95
Required sample size	114

FORMULA:

$$n = \frac{Z^2_{(1-\alpha/2)} * \mathrm{p}(1-\mathrm{p})}{d^2}$$

Where,

p - Expected proportion

d - Precision

$Z_{1-\alpha/2}$ - Two-sided Z value for corresponding α (1.96)

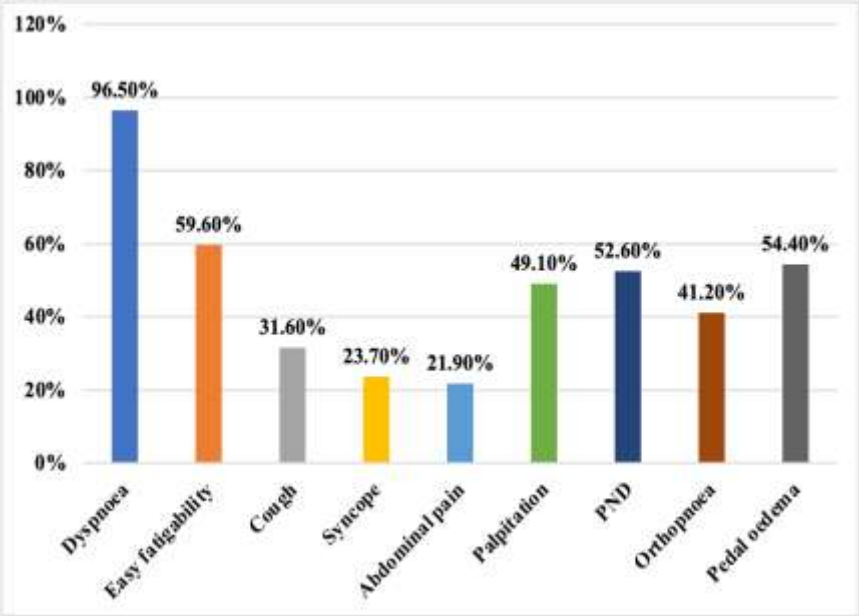
STATISTICAL ANALYSIS

Data was analysed using SPSS v.28. All categorical data was summarized using frequency and percentages, all continuous data was described using mean and standard deviation or median and interquartile range based on the distribution.

RESULTS

In the present study age distribution shows that the peak incidence was above the age of 60 and the mean age was 58.5±14.1yrs (Mean±SD). Out of 114 patients 35 were females and 79 were males. In the current study 96.5% of the patients had history of exertional dyspnea at admission.Easy fatigability was present in 59.6% of the participants, making it the second most prevalent symptom. Pedal oedema was observed in 54.4% of the patients. Paroxysmal nocturnal dyspnoea was observed in 52.6% of the individuals, palpitation in 49.1%, and orthopnea in 41.2% (as shown in figure 1).

Figure-1 : **SYMPTOMATOLOGY**



A total of 69 out of 114 patients (60.5%) had a previous history of myocardial infarction. All individuals had documented electrocardiogram (ECG) and echocardiogram (ECHO) records available. Where as 41 (36%)of them has h/o alcohol consumption among them 18(15.7%) of them had alcohol consumption for more than 10yrs(>90gm/day). And 55(48.2%) had diabetes mellitus and among them 15(13%) had diabetes for more than 10 yrs (as shown in Table 1).

Table-1 : **COMORBIDITIES**

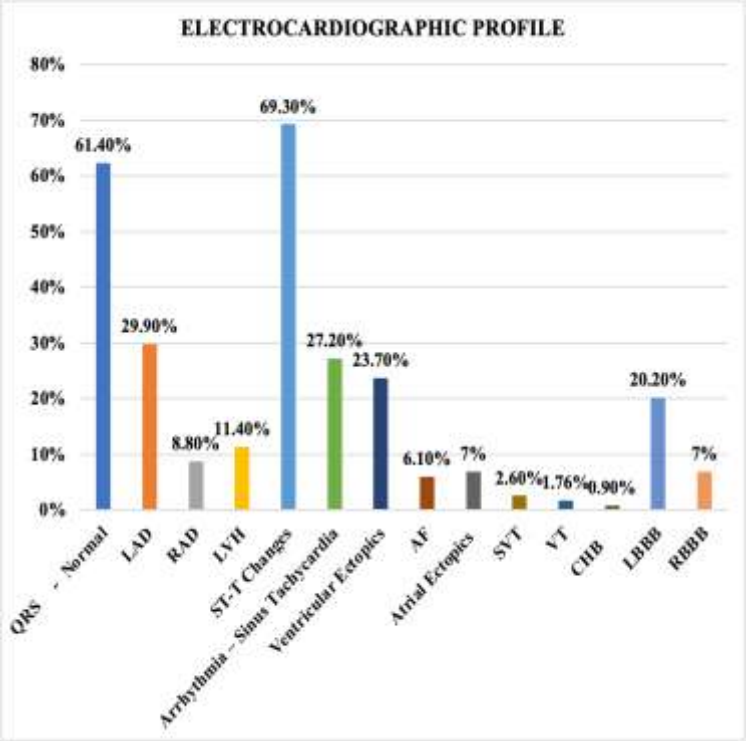
PAST HISTORY	No. OF CASES	PERCENTAGE
Diabetes	55	48.2%
Hypertension	57	50%
IHD	69	60.5%
Pregnancy	2	1.8%
Alcohol consumption	41	36%

On examination among 114 about 70.2 % of the patients had basal crackles making it most common finding where as pedal edema was present in 54.4 % of the patients. JVP was elevated in 54.4% and 21.9 % had hepatomegaly. On auscultation pansystolic murmur was noticed in in the apex in 50.9 % with LVS3 present in 43.9 %. Pan systolic murmur was present in tricuspid area (TR) in 45.6% of patients. On examination of peripheral pulse 47.4% had tachycardia, 14%had bradycardia, 41.2% had abnormal rhythm. On chest X ray 65.8% had cardiomegaly. Pleural effusion was present in 34.2%. and 36.8% had Pulmonary plethora.

The electrocardiographic profile exhibits abnormalities in terms of heart rate, rhythm, axis, and chamber enlargement. The predominant anomaly observed was ST-T alterations, which were detected in 69.3% of the patients. 27.2% of the individuals had sinus tachycardia. Left bundle branch block was noticed in 20.2% of patients. Right bundle branch block was found in 7 %.

Where as 6.1% had atrial fibrillation as shown in figure 2.

Figure-2 **: ELECTROCARDIOGRAPHIC PROFILE**



On echocardiogram the mean left ventricular ejection fraction was 38.04±6.2% (Mean±SD). The LV ejection fraction was less than 20% only in patient. It was between 20-29% in 10.5 %, between 30-39% in 33.3 % of patients and between 40 to 45% in 55.3 % of patients. The mean LV EDD was 6.03±0.24 cm(Mean±SD) with majority i.e. 62.3 % of the patients having LV end diastolic diameter ranging between 5.5- 6 cm. The mean LV ESD was 4.37±0.49cm(Mean±SD) in the study population. Most of the patients (71.10 %) had an end systolic diameter more than 4.5- 5cm. The predominant form of Dilated cardiomyopathy identified in the study was ischaemic dilated cardiomyopathy, accounting for 60.50% of all cases of cardiomyopathies. Alcoholic and Idiopathic dilated cardiomyopathy was 15.9% each.Diabetic cardiomyopathy was 13.2% and 1.8% was peripartum cardiomyopathy (as shown in table 2)

. Table-2: **ETIOLOGY**

CAUSES	No. OF CASES	PERCENTAGE
Ischemic	69	60.5%
Alcoholic	18	15.9%
Idiopathic	18	15.9%
Diabetic	15	13.2%
Peripartum	2	1.8%

DISCUSSION

In this study peak incidence was noted above 6th decade and the mean age was 58.5 ± 14.1yrs (Mean±SD).A study done by Rana et al9 from 2011 to 2014 showed that peak incidence was noted between 40- 60 yrs of age group Whereas astudy done by Tomar et al10in 2018 showed that most of the patients with DCM were above the age of 60 this was similar to the finding of our study. Among the 114 patients, 35 were female and 79 were males wich is similar to study done by Rana et al 9 in which male patients outnumbered female patients. In our study dyspnea was present in almost every patients(96.5%). Easy fatigability, Pedal oedema and PND were the other predominant symptoms in our study. A study conducted by Ganesh et al11 revealed that the majority of patients exhibited symptoms of dyspnoea, oedema, and paroxysmal nocturnal dyspnoea, which aligns with the results of our study. In our study the most significant risk factor was h/o IHD. Among 114 patients 41 (36%)of them has h/o alcohol consumption this was more compared to a study done by Rao et al12 which showed that 22.58% of individuals with DCM had h/o alcohol consumption. The incidence of alcohol consumption is much higher in a study done by Massumi et al13 (60%). Tachycardia was the predominant peripheral pulse abnormality noted in our study(47.4%). This was similar to the findings noted in

the study done by Rana et al 9, which showed that 63% had tachycardia and that was the predominant pulse abnormality in their study too. The most common physical finding in our study was presence of basal crepitations(70.2%). Similar observations were noted by Tomar et al in his study. In the study done by Rana et al 9 93% had basal crepitations. A study done by Mehra MR et al 14 also showed that predominant sign on physical examination was presence of basal crepts(78%).

The most common abnormality noticed in electrocardiography was ST-T changes (69.3%). However a study done by Tomar et al 10 showed that ST -T changes were found only in 26% of individuals, and the most common finding in their study was ventricular ectopics(46%). In our study most common type of DCM was Ischemic Dilated Cardiomyopathy. That could be one of the reasons why the most common ECG change is ST-T changes in our study. The mean LV EF in our study was 38.04±6.2%(Mean±SD). A study done by Rao VD et al 12 showed that mean EF was 29.5%.The mean LV EDD in our study was 6.03±0.24cm (Mean±SD) with majority (62.3 %) of subjects having LV end diastolic diameter between 5.5-6 cm. The mean LV ESD was 4.37±0.49cm (Mean±SD) with most of the patients (71.10 %) having end systolic diameter more than 4.5- 5cm. In Tomar et al's 10 study, the mean left ventricular end-diastolic diameter (LV EDD) was 5.86cm. The majority of individuals (53%) had an LV EDD more than 6 cm. Within the same study, the mean left ventricular end-systolic diameter (LV ESD) was measured to be 4.75 cm. The majority of patients (66%) had an LV ESD more than 5 cm.

According to our study, the most common type of Dilated cardiomyopathy was found to be ischemic dilated cardiomyopathy comprising 60.50% of all cardiomyopathies. Alcoholic and Idiopathic dilated cardiomyopathy was 15.9% each in this study. According to study done by Rana et al the most common type of DCM was idiopathic (30%) and Alcohol related DCM was second most common (23%). According to a study done by Jain et al 15 the most common etiology of DCM was Ischemic (37%). Mean age of the study population in our study was higher than that of the patients in other studies, that could be one of the reasons why IHD is the most common cause of DCM in our study.

CONCLUSION

In our study dilated cardiomyopathy was more common elderly population and it is more common in males. Most common symptom was breathlessness. Ischemic dilated cardiomyopathy, accounting for 60.50 percent of all cardiomyopathies, was the most prevalent kind of dilated cardiomyopathy in the study population. Alcohol was the next most common cause (15.9%). Idiopathic dilated cardiomyopathy was present in 15.9% of the study population.

LIMITATIONS:

This is an observational study where long term follow up was not done. Since dilated cardiomyopathy is a progressive disease long term follow up study would reflect more on outcome and mortality rate in patients with different risk factors.The other limitation of the study is that it is a single centric study hence it may not reflect the broader population across the country ,as the patient demographic profile and treatment pattern can vary significantly between centres.

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