

# Study on Risk Factor and Etiology of Dilated Cardiomyopathy – Retrospective Analysis

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## Abstract

**Introduction:** Dilated cardiomyopathy (DCM) is an important cause of sudden cardiac death and heart failure and is the leading indication for cardiac transplantation in children and adults worldwide. Different etiologies can lead to DCM, including inherited, infectious, and inflammatory diseases.

**Aim:** Our study aims to analyze the risk factors and the etiology of DCM.

**Materials and Methods:** This observational retrospective study was conducted to analyze the risk factors and the etiology of DCM. A total of 50 patients were included in this study. Informed consent was obtained from the patients. Detailed medical history and physical examination with basic laboratory investigations were made.

**Results:** Out of 50 patients, 34 were male, and 16 were female. The majority were in the age group between 51 and 55 years followed by 46–50 years. Twenty-nine patients had hypertension followed by alcoholic of 26 patients and diabetes of 25 patients. Seventeen patients of diabetes had moderate left ventricular dysfunction and 13 patients of hypertensive had severe left ventricular dysfunction. Overall alcoholic and hypertensive patients had moderate and severe left ventricular dysfunction. Based on the electrocardiogram outcome, the majority had left ventricular hypertrophy.

**Conclusion:** Alcoholism, diabetes, and smoking are the significant risk factors in DCM. The severity of DCM is directly proportional to the number of risk factors present.

**Key words:** Diabetes, Dilated cardiomyopathy, Hypertension, Smoking

## INTRODUCTION

Dilated cardiomyopathy (DCM) is an important cause of sudden cardiac death (SCD) and heart failure (HF) and is the leading indication for cardiac transplantation in children and adults worldwide.<sup>[1]</sup> DCM is more commonly seen in men than in women. Its prevalence in the general population is estimated at 36 cases per 100,000. There are different types of cardiomyopathy caused by a range of factors from coronary artery heart disease to certain drugs. These can all lead to various complications such as atrial fibrillation, cardiac failure, and cardiogenic

shock.<sup>[2]</sup> Ischemic cardiomyopathy caused by coronary artery disease is the most common cause of congestive HF. It is characterized by ventricular chamber enlargement and systolic dysfunction with normal left ventricular wall thickness. Different etiologies can lead to DCM, including inherited, infectious, and inflammatory diseases. DCM has been associated with mutations in genes for desmin (cytoskeletal), lamin C (nuclear membrane), or myosin (contractile proteins). However, the majority of cases remain unexplained after a thorough review of the secondary cause.<sup>[3]</sup>

Cardiomyopathy is a progressive disease of the myocardium or heart muscle. In most cases, the cardiac muscle weakens and is unable to pump blood to the rest of the body.<sup>[4]</sup> In most cases, DCM is progressive, leading to HF and death. Classic symptoms include paroxysmal nocturnal dyspnea, orthopnea, leg swelling, and shortness of breath. Non-specific symptoms of fatigue, malaise, and weakness also can be present. More severe cases can

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present with thromboembolic complications, conduction disturbances, arrhythmias, or even SCD. Physical examination findings are mostly not specific to other causes of cardiomyopathy and consist of typical findings seen with congestive HF.

Findings include crackles in the lung fields, elevated jugular venous pressures, peripheral edema, and an S3 gallop. Classically, the point of maximum impulse or PMI is displaced laterally. Tricuspid or mitral regurgitation murmurs are not uncommon as a result of ventricular enlargement and annular dilation. Neck examination may reveal jugular venous distension, A-wave, large V waves, and positive hepatojugular reflux.

Without a transplant, the survival rates are low mortality rate which is very high if the cardiomyopathy patient is admitted with serious complications such as cardiac failure and cardiogenic shock.<sup>[5]</sup> While most patients with DCM have symptoms, a few patients may be asymptomatic because of the compensatory mechanisms. The continued enlargement of the ventricles leads to a decline in ventricular function, followed by conduction system abnormalities, ventricular arrhythmias, thromboembolism, and HF. The earlier these patients are identified and treated, the better the prognosis.

**Aim**

Our study aims to analyze the risk factors and the etiology of DCM.

**MATERIALS AND METHODS**

This observational retrospective study was conducted to analyze the risk factors and the etiology of DCM. A total of 50 patients we included in this study. Informed consent was obtained from the patients. Patients, more than 25 years and less than 60 years with DCM, were included in the study. Restrictive cardiomyopathy and hypertrophic cardiomyopathy patients were excluded from the study. Detailed medical history and physical examination with basic laboratory investigations such as complete blood count, blood sugar, renal function tests, liver function test, lipid profile and urine analysis, electrocardiogram, X-ray chest PA view, echocardiogram, and ICTC were made.

**RESULTS**

Out of 50 patients, 34 were male, and 16 were female. Three patients were in the age group between 31 and 35 years, two patients between 36 and 40 years, five patients between 41 and 45 years, 15 patients between 46 and 50 years,

17 patients between 51 and 55 years, and 8 patients between 56 and 60 years [Table 1].

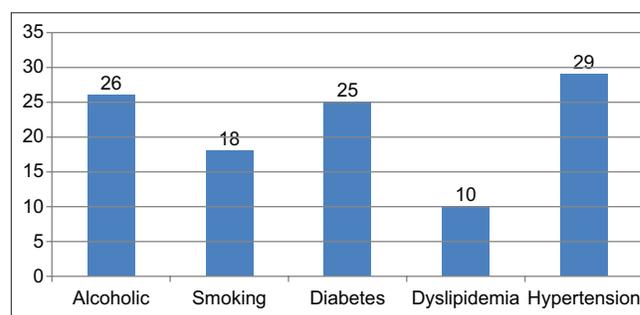
In our study, 26 patients had a habit of alcohol drinking, 18 patients had a habit of smoking, 25 patients had diabetes, 10 patients had dyslipidemia, and 29 patients had hypertension [Figure 1].

Ten patients with alcoholic addictions, 6 patients with smoking habits, 8 patients with diabetes, 6 patients with dyslipidemia, and 13 patients with hypertension, had severe left ventricular dysfunction [Figure 2].

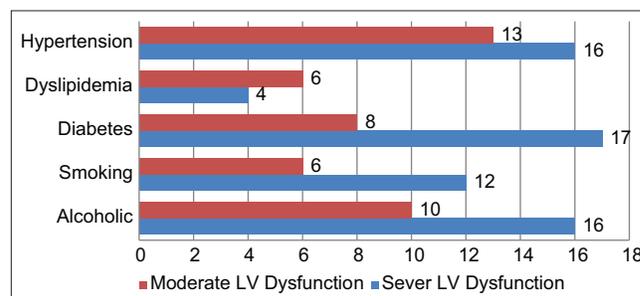
Five patients had a habit of smoking and alcohol drinking, six patients with diabetes and smoking, six patients with smoking and hypertension, nine patients with alcohol and hypertension, seven patients with alcohol and diabetes, three patients with alcohol, smoking, and diabetes, and two patients with alcohol, smoking, and hypertension had moderate left ventricular dysfunction. Three patients had a habit of smoking and alcohol drinking, three patients with

**Table 1: Age and sex distribution**

Age	Males	Females
31-35	2	1
36-40	1	1
41-45	4	1
46-50	9	6
51-55	13	4
56-60	5	3
Total	34	16



**Figure 1: Comorbid of the study patients**



**Figure 2: Distribution of severity of dilated cardiomyopathy**

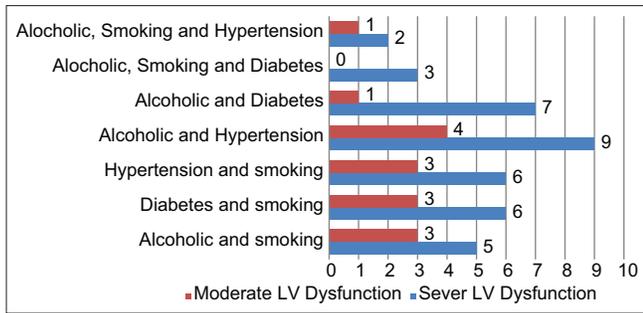


Figure 3: Distribution of severity of dilated cardiomyopathy

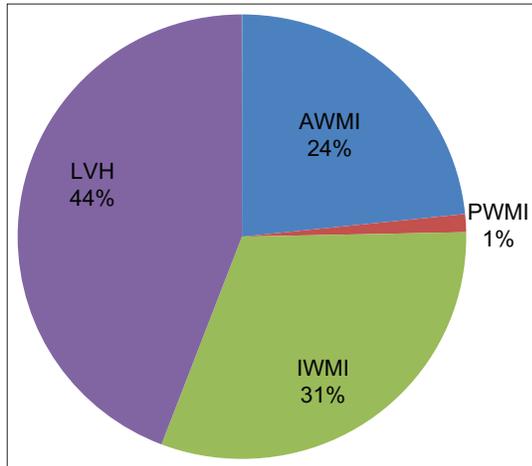


Figure 4: Electrocardiogram outcome in dilated cardiomyopathy

diabetes and smoking, three patients with smoking and hypertension, four patients with alcohol and hypertension, one patient with alcohol and diabetes, and one patient with alcohol, smoking, and hypertension had moderate left ventricular dysfunction [Figure 3].

Twenty-two patients had left ventricular hypertrophy, 12 patients had anterior wall myocardial infarction, 1 patient had posterior wall myocardial infarction, and 15 patients had inferior wall myocardial infarction [Figure 4].

## DISCUSSION

In our study, majority were male compared to females who are similar to Deshmukh *et al.*<sup>[6]</sup> study, 2011, where the male:female ratio was 1.5:1. The higher number of patients was in the age group of above 45 years, whereas research was done by Deshmukh *et al.*<sup>[6]</sup> shown that in his study, most of them were in the age group above 60 years.

In our study, the majority of the study, the population had hypertension, followed by alcoholic and diabetes. Therefore, it is said that only alcohol is not enough to cause DCM in most cases; alcoholic cardiomyopathy is more common in those with a genetic predisposition to

heart diseases, in contrast to those without. However, we did not do genetic testing in alcoholic DCM cases due to financial reasons. Once DCM develops in alcoholics or smokers, the prognosis is uniformly poor.<sup>[7]</sup>

All of the patients who were undertaken for this study either had moderate or severe LV dysfunction. The severity of the left ventricular dysfunction correlated directly with the history of smoking and alcoholism but the study done by Reeves *et al.* in 1978 shown that symptomatic alcoholic patients may have systolic dysfunction of various degrees, known as alcoholic cardiomyopathy. However, data on systolic function in asymptomatic alcoholics are conflicting.<sup>[8-11]</sup>

In our study, patient with a habit of alcohol and hypertension had left ventricular dysfunction more compared with other comorbidities. Diabetes and smoking also increase the risk of developing DCM. Patients who had a history of alcoholism and who had diabetes showed a greater degree of ventricular dysfunction. Dyslipidemia alone does not seem to cause DCM. When dyslipidemia and diabetes are present, the risk increases tangentially compared to dyslipidemia with systemic hypertension. In Jain *et al.* study, ischemic cardiomyopathy comprised 37% of cases followed by idiopathic DCM seen in 30% of patients.<sup>[12]</sup>

## CONCLUSION

The severity of the left ventricular dysfunction correlated directly with the history of smoking and alcoholism. Patients who were both smokers and alcoholics had more significant damage to the heart. Alcoholism, diabetes, and smoking are the significant risk factors in DCM. The severity of DCM is directly proportional to the number of risk factors present.

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