

# A Prospective Observational Study on Risk Factors of Patients with Dilated Cardiomyopathy

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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:** The aim of the study was to study the risk factors of patients with DCM.

**Materials and Methods:** This prospective observational retrospective study was conducted to analyze the risk factors and the etiology of DCM in Headquarters hospital, Dindigul. A total of 75 patients were included in this study. Detailed medical history and physical examination with basic laboratory investigations were made.

**Results:** Out of 75 patients, 54 were males and 21 were females. The majority were in the age group between 51 and 55 years, followed by 46–50 years. Forty-five patients had ischemic DCM and 30 patients had non-ischemic DCM. Twenty-six patients had diabetes, followed by alcoholic of 26 patients and hypertension of 24 patients. Seven patients of diabetes had moderate left ventricular (LV) dysfunction, and 18 patients of hypertensive had severe LV dysfunction. Overall alcoholic and hypertensive patients had moderate and severe LV dysfunction. Based on the ECG outcome, the majority had LV 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:** Alcohol, Diabetes, Dilated cardiomyopathy, Hypertension, Risk factors, 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/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 (LV) 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 present with thromboembolic complications, conduction disturbances, arrhythmias, or even SCD. Physical examination findings are mostly not specific to other

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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 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, 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**

The aim of the study was to study the risk factors of patients with DCM.

**MATERIALS AND METHODS**

This observational prospective study was conducted in Headquarters hospital, Dindigul. Patients more than 18 years and <60 years with DCM were included in the study. Restrictive cardiomyopathy, 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, ECG, X-ray Chest PA view, echocardiogram, and ICTC were done.

**RESULTS**

Out of 75 patients, 54 males and 21 females are presented in Table 1.

Out of 75 patients, 45 patients had ischemic DCM and 30 patients had non-ischemic DCM [Table 2].

Out of 75 patients, 54 were males and 21 were females. Five patients were in the age group between 31 and 35 years, three patients between 36 and 40 years, seven patients between 41 and 45 years, 23 patients between 46 and 50 years, 23 patients between 51 and 55 years, and 14 patients between 56 and 60 years [Figure 1].

In our study, 26 patients had a habit of alcohol drinking, 17 patients had a habit of smoking, 26 patients had diabetes, 14

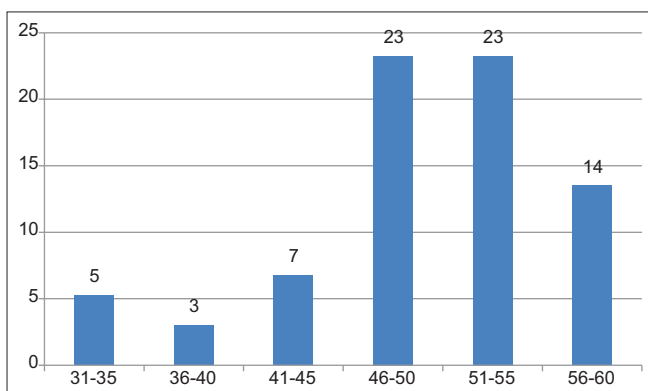


Figure 1: Age distribution

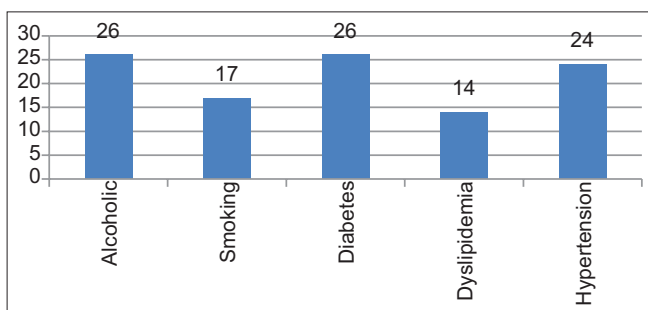


Figure 2: Comorbid of the study patients

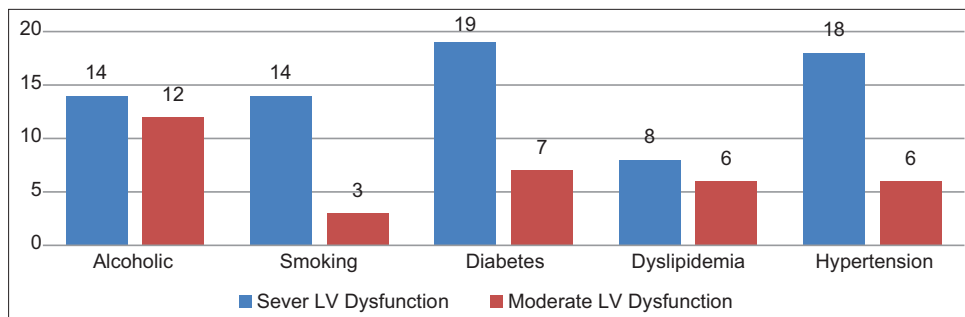


Figure 3: Distribution of severity of dilated cardiomyopathy

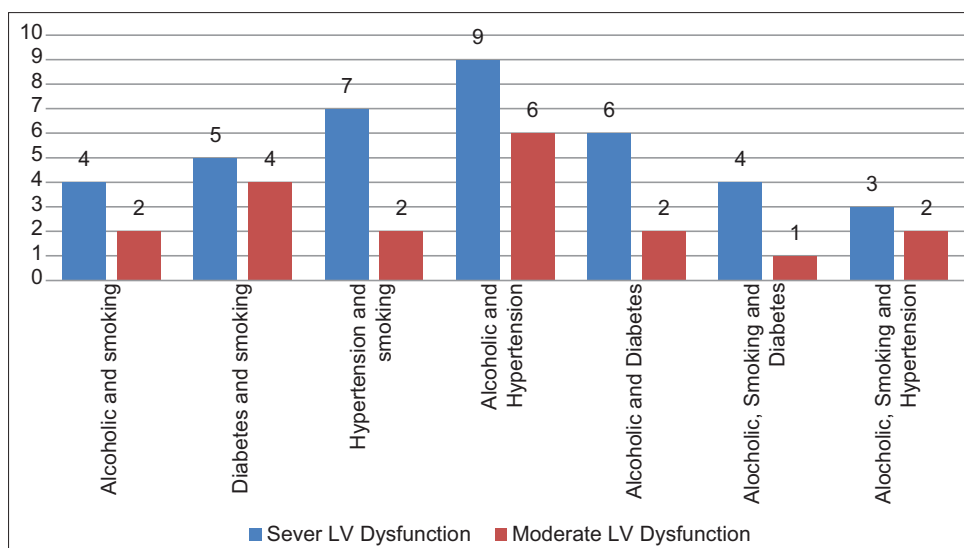


Figure 4: Distribution of severity of dilated cardiomyopathy

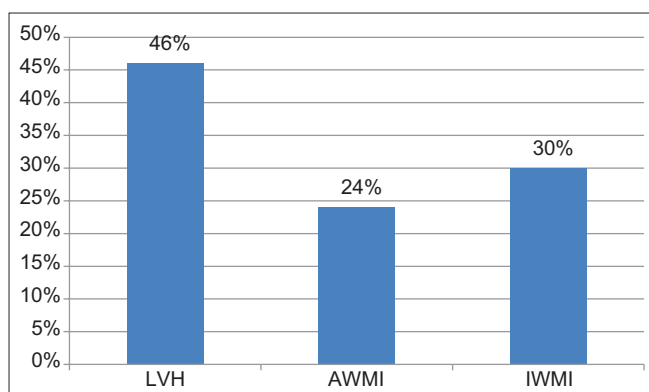


Figure 5: ECG outcome in dilated cardiomyopathy

Table 1: Gender distribution

Gender	Number of Patients
Male	54
Female	21

Table 2: Diseases distribution

Diseases	Number of Patients
Ischemic cardiomyopathy	45
Non-ischemic cardiomyopathy	30

patients had dyslipidemia, and 24 patients had hypertension [Figure 2].

Twelve patients who had a habit of alcohol drinking, three patients who had a habit of smoking, seven patients who had diabetes, six patients with dyslipidemia, and six patients with hypertension had moderate LV dysfunction. Fourteen patients with alcoholic addictions, 14 patients with smoking habits, 19 patients with diabetes, eight patients with

dyslipidemia, and 18 patients with hypertension had severe LV dysfunction [Figure 3].

Two patients had a habit of smoking and alcohol drinking, four patients with diabetes and smoking, two patients with smoking and hypertension, six patients with alcohol and hypertension, two patients with alcohol and diabetes, one patient with alcohol, smoking and diabetes, two patients with alcohol, smoking, and hypertension had moderate LV dysfunction. Four patients had a habit of smoking and alcohol drinking, five patients with diabetes and smoking, seven patients with smoking and hypertension, nine patients with alcohol and hypertension, six patients with alcohol and diabetes, four patients with alcohol, smoking, and hypertension, and three patients with alcohol, smoking, and hypertension had moderate LV dysfunction [Figure 4].

Thirty-four patients had LV hypertrophy, 18 patients had anterior wall myocardial infarction, and 23 patients had inferior wall myocardial infarction [Figure 5].

## DISCUSSION

In our study, majority were males 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 diabetes, 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 LV 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 LV 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 LV 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.

## REFERENCES

1. Hershberger RE, Morales A. Dilated cardiomyopathy overview. In: Adam MP, Ardinger HH, Pagon RA, Wallace SE, Bean LJ, Stephens K, editors. GeneReviews®. Seattle, WA: University of Washington; 2007.
2. Martino TA, Liu P, Sole MJ. Viral infection and the pathogenesis of dilated cardiomyopathy. *Circ Res* 1994;74:182-8.
3. Stergiopoulos K, Lima FV. Peripartum cardiomyopathy-diagnosis, management, and long term implications. *Trends Cardiovasc Med* 2019;29:164-73.
4. Jameson JN, Kasper DL, Harrison TR, Braunwald E, Fauci AS, Hauser SL, *et al.* Harrison's Principles of Internal Medicine. 16<sup>th</sup> ed. New York: McGraw-Hill Medical Publishing Division; 2005.
5. Joseph SM, Cedars AM, Ewald GA, Geltman EM, Mann DL. Acute decompensated heart failure: Contemporary medical management. *Tex Heart Inst J* 2009;36:510-20.
6. Deshmukh A, Deshmukh G, Garg PK. A pilot study of dilated cardiomyopathy (DCM) in Western Uttar Pradesh, India: A four-year review. *Medico Legal Update* 2011;11:1-3.
7. Dancy M, Maxwell JD. Alcohol and dilated cardiomyopathy. *Alcoholology* 1986;21:185-98.
8. Reeves WC, Nanda NC, Gramiak R. Echocardiography in chronic alcoholics following prolonged period of abstinence. *Am Heart J* 1978;95:578-52.
9. Askanas A, Udoshi M, Sadjadi SA. The heart in chronic alcoholism. A noninvasive study. *Am Heart J* 1980;99:9-16.
10. Regan TJ. Alcoholic cardiomyopathy. *Prog Cardiovasc Dis* 1984;27:141-52.
11. Wu CF, Sudhaker M, Ghazanfar G, Ahmed SS, Regan TJ. Preclinical cardiomyopathy in chronic alcoholics. A sex difference. *Am Heart J* 1976;91:281-6.
12. Jain A, Tewari S, Kapoor A Kumar S, Garg N, Goel PK, *et al.* Clinical profile of dilated cardiomyopathy. *Indian Heart J* 2004;56:507-17.

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