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A Clinic Based Observational Study on Association Between Dilated Cardiomyopathy and Alcohol

Kadarla Rohith Kumar^{1*}, D. Vamshi Krishna Reddy², Dr P. Manjula³

Department Of Pharmacy Practice, Care College of Pharmacy, Oglapur(v), Damera(M), Warangal(Rural), Telangana-506006, India.

ABSTRACT

Alcohol is the most widely consumed chemical substance in the world. Exposure to high levels of alcohol for a long period could lead to progressive cardiac dysfunction and heart failure. Alcoholic cardiomyopathy is a cardiac dysfunction associated with chronic and excessive alcohol intake. In spite of its clinical importance, data on ACM and how alcohol damages the heart is limited. In this article, we evaluate the available data linking excessive alcohol consumption with heart failure and dilated cardiomyopathy. The study was conducted in Warangal and a total of 124 patients admitted in the hospital with DCM were included and the subjects were screened based on drinking patterns of alcohol. Alcohol without abstinence was a strong predictor of cardiac death. This suggests that a more aggressive approach to alcohol cessation is needed in these patients.

Key words: Alcohol; Alcoholic cardiomyopathy (ACM); Dilated cardiomyopathy (DCM); Heart failure

*Corresponding Author Email: mailrohith939@gmail.com

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INTRODUCTION

Alcohol is the most frequently consumed chemical substance in the world .According to WHO Global status report on alcohol and health 2014, 38.3% of the world population is reported to consume alcohol regularly. An individual's consumption of alcohol per year is 6.2 litres. 30% of Indian population consumes alcohol regularly, 11% Indians are moderate to heavy drinkers. The average Indian consumes 4.3 litres of alcohol per year and the average rural Indian consumes 11.4 litres of alcohol per year¹.

Chronic and excessive alcohol consumption could lead to progressive cardiac dysfunction and heart failure ². Heart failure is most frequently related to the presence of arterial hypertension and ischemic cardiomyopathy³. Among cardiomyopathies, the variety that most often leads to heart failure and the first cause of heart transplant among young patients is dilated cardiomyopathy (DCM)⁴. DCM is defined as left ventricular systolic dysfunction and dilatation, which may or may not be associated with a similar right ventricular dysfunction. Excessive alcohol consumption is prominent among the multiple etiologies causing DCM and has been considered the major cause of nonischemic DCM in Western countries. Despite the key clinical importance of alcohol as a cause of DCM, relatively few studies have investigated the effects of alcohol on the heart and the clinical characteristics of DCM caused by excessive alcohol consumption (known as alcoholic cardiomyopathy). Moreover, conflicting results are available regarding several factors related to alcoholic cardiomyopathy (ACM), such as the precise amount of alcohol necessary to cause the disease, whether the long-term prognosis of ACM is similar to that of other forms of DCM, or whether complete alcohol abstinence is necessary to improve clinical outcomes. In this study, we evaluate the available data linking alcohol consumption with heart failure and DCM³.

MATERIALS AND METHOD

This study was a prospective observational study conducted in Mahatma Gandhi Memorial Hospital. Warangal, Telangana, India between February - September, 2017. The study was approved by the Institutional Ethical Committee and all the participants provided a written informed consent. 124 patients of all age groups diagnosed with dilated cardiomyopathy and with moderate to severe left ventricular dysfunction admitted in the hospital were enrolled in this study. Patients with a history of intake of cardio toxic drugs, out patients and with other types of cardiomyopathies were excluded. Appropriate data collection form was designed, data collected and subjected to analysis.

RESULTS AND DISCUSSION

Of 124 patients in our study 95 were males and 29 females. The number was more in males for

the simple obvious reason that in India prevalence of alcoholism is much more in males than in females. In our study more number of patients was seen in the age group of 51-70 which clearly indicates that incidence of dilated cardiomyopathy is directly related to the duration of alcoholism.

Distribution of Patients According to their Social Habits:

Subjects were classified according to their social habits - alcoholism and smoking. It was seen that 69% patients had one or both habits of smoking and alcohol and non alcoholics were 31%. Other studies have also reported similar observations. In a prospective registry of patients with mild to, moderate DCM, about half of whom presented with heart failure, excessive alcohol intake was found in 23% of the patients⁵. An average adult of 70 kg body weight consuming 67 grams/day of alcohol for 20 years or 45 grams/day of alcohol for 30 years has clearly shown a decreased LVEF⁶.

Studies on pathophysiology of heart in relation to alcohol showed that there was an increased ventricular thickness when consumption exceeded 75 mL/d (60 g) of ethanol, and the increase was higher among those subjects who consumed over 125 mL/d (100 g), without specifying the duration of consumption⁷. Lazarević *et al*⁸ divided a cohort of 89 asymptomatic individuals whose consumption exceeded 80 g/d (8 standard units) into 3 groups according to the duration of their alcohol abuse. Askanas *et al*⁹ found a significant increase in the myocardial mass and of the pre-ejection periods in drinkers of over 12 oz of whisky (approximately 120 g of alcohol) compared to a control group of non-drinkers. Komajda *et al*¹⁰ reported that DCM patients admitted due to HF had higher alcohol consumption levels than patients admitted to undergo surgical procedures (101 mL/d vs 64 mL/d; RR = 7.6, $P < 0.001$). Furthermore, Gillet⁶ published a similar study in which a cohort of 23 patients with DCM reported higher average daily alcohol consumption (82 g/d vs 30 g/d; $P < 0.001$) and a greater duration of that consumption (34 vs 22 years, $P < 0.001$) than a second group of 46 individuals suffering from other forms of heart disease.

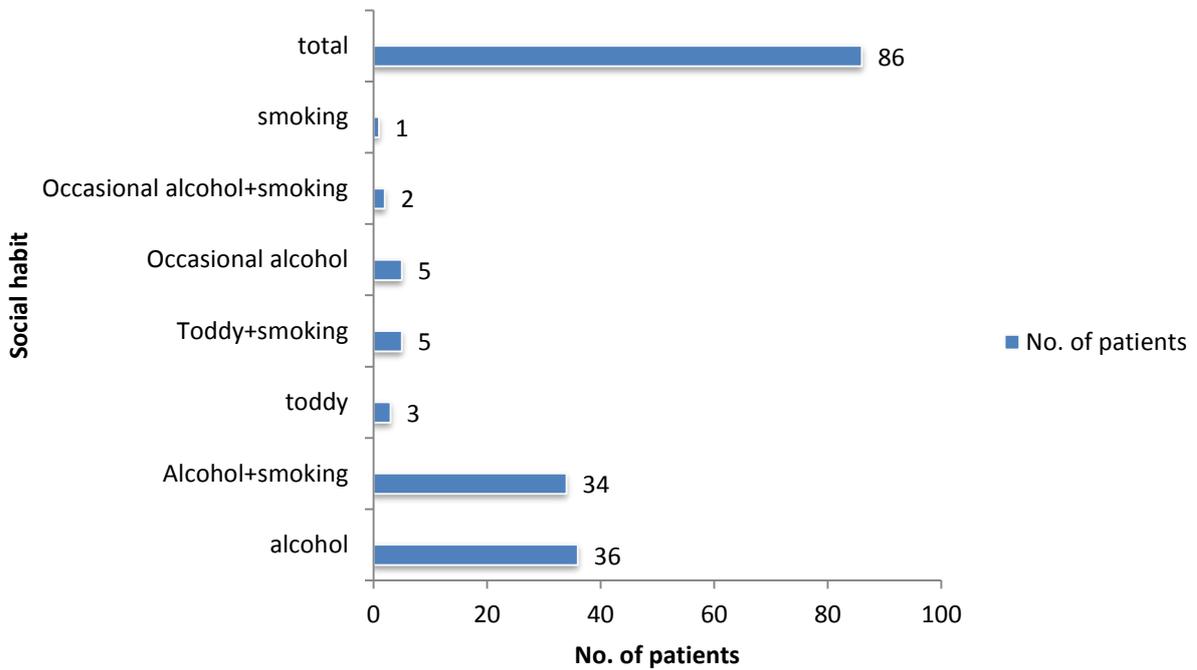


Figure 1: Social habits versus number of patients.

Distribution of Patients According to Consumption of Alcohol

In 1998 McKenna¹¹ described an incidence of excessive alcohol consumption of 40% in a group of 100 DCM patients compared to 23% found in a control group of 211 healthy subjects.

In our study we observed that, among alcoholics, 78 were regular alcoholics and 07 were occasional alcohol

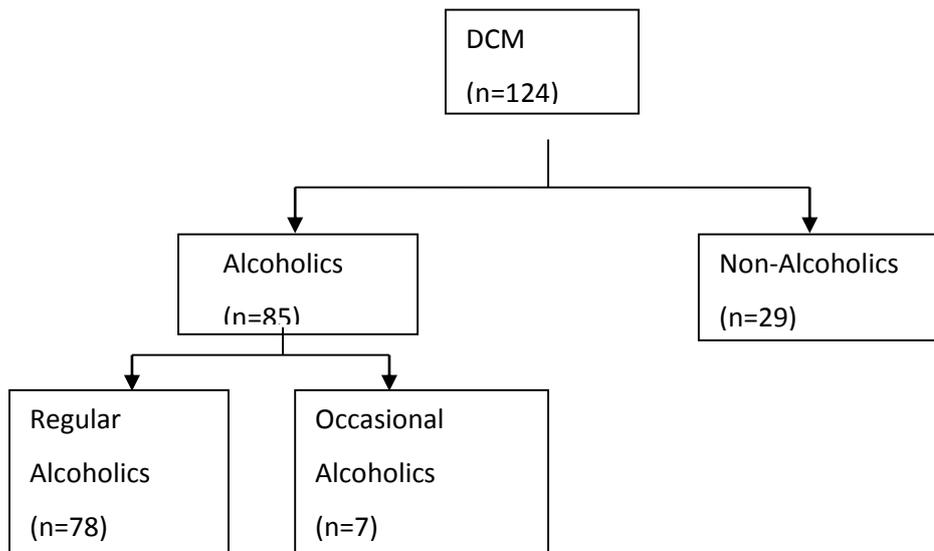


Figure 02: Distribution of patients according to consumption of alcohol.

Hypertension, diabetes mellitus and coronary artery disease seems to be the risk factors in considerable number of patients. Cardiac muscle undergoes hypertrophy to compensate for

compromised cardiac function, overtime the size of heart increases but function decreases and hence these risk factors can contribute to the DCM.

Heavy alcohol consumption should be urgently discouraged in patients with left ventricular systolic dysfunction, because of the clear increase in non cardiovascular and total mortality, and because of the evidence that alcohol consumption can lead to impairment of left ventricular contractile function¹². There is evidence from experimental and human studies that total withdrawal of alcohol may normalize left ventricular dysfunction, at least in acute or early stages of the disease¹³.

The health effects of ethanol are dependent on the amount of alcohol consumed and the pattern of drinking¹⁴. Alcoholism is a wide spread medical problem and therefore alcohol abuse may well represent the major cause of non ischemic dilated cardiomyopathy⁵. Although many studies mention the toxic effects of alcoholism, there are studies where it is said that low levels of alcohol taken in moderation have beneficial effects on the health of an individual¹⁵, but alcohol is also addictive. Hence an individual who starts on low levels of alcohol in moderation may end up getting addicted and the beneficial effects are lost and alcohol becomes the risk factor.

Distribution Based on Duration of Alcohol Intake among Regular Alcoholics.

Table 01: Distribution based on duration of alcohol intake among regular alcoholics.

Duration of alcoholism (in years)	No of patients	%
4	01	1.28
5	11	14.10
6	07	8.79
7	03	3.84
8	04	5.12
9	02	2.56
10	30	38.46
>10	20	25.64
Total	78	100

Among regular alcoholics duration of alcoholism varied – 4 years (1.28%), 5 years (14.10%), 6 years (8.79%), 7 years (3.84%), 8 years (5.12%), 9 years (2.56%), 10 years (38.46%), greater than 10 years (25.64%). It is clearly seen that alcoholism for more than 5 years has resulted in DCM in considerable number of patients .whereas, alcoholism for less than 5 years was seen in very few patients, again indicating that alcohol affects in a cumulative way. Urbano-Márquez *et al*¹⁶ found a clear decrease in the ejection fraction, in a cohort of 52 alcoholics, which was directly proportional to the accumulated alcohol intake throughout the patient's lives.

Distribution of Patients Based on Consumption of Alcohol among Regular Alcoholics.

Patients who consumed upto 60 gms of alcohol per day among regular alcoholics were 5.12%, upto 80 grams of alcohol were 20.51% and majority of the patients were in age group of 51-70,

Table 02: Distribution of patients based on consumption of alcohol among regular alcoholics.

Alcohol quantity(gm/day)	No of patients	%
60	04	5.12
80	16	20.51
100	37	47.43
120	11	14.10
>140	10	12.82
Total	78	100

upto 100 grams of alcohol were 47.43% and majority of the patients were in the age group of 51-70, upto 120 grams of alcohol were 14.10% and majority of the patients were in the age group of 51-60, >140 grams of alcohol were 12.82% and majority of the patients were in the age group of 51-60 of the total population. The data obtained from our study indicated that majority of the patients who consumed upto 100grams of alcohol were diagnosed to have DCM.

Majority of studies on the long-term prognosis of ACM used the cut-off point of 80 g/d for a minimum of 5 years to consider alcohol as the cause of DCM³. Amount of alcohol consumption in the DCM patients in our study, revealed that most of the patients consumed greater than 60 grams of alcohol per day for a duration of more than 5 years and led to a conclusion that a cumulative effect of alcoholism has resulted in DCM in these patients.

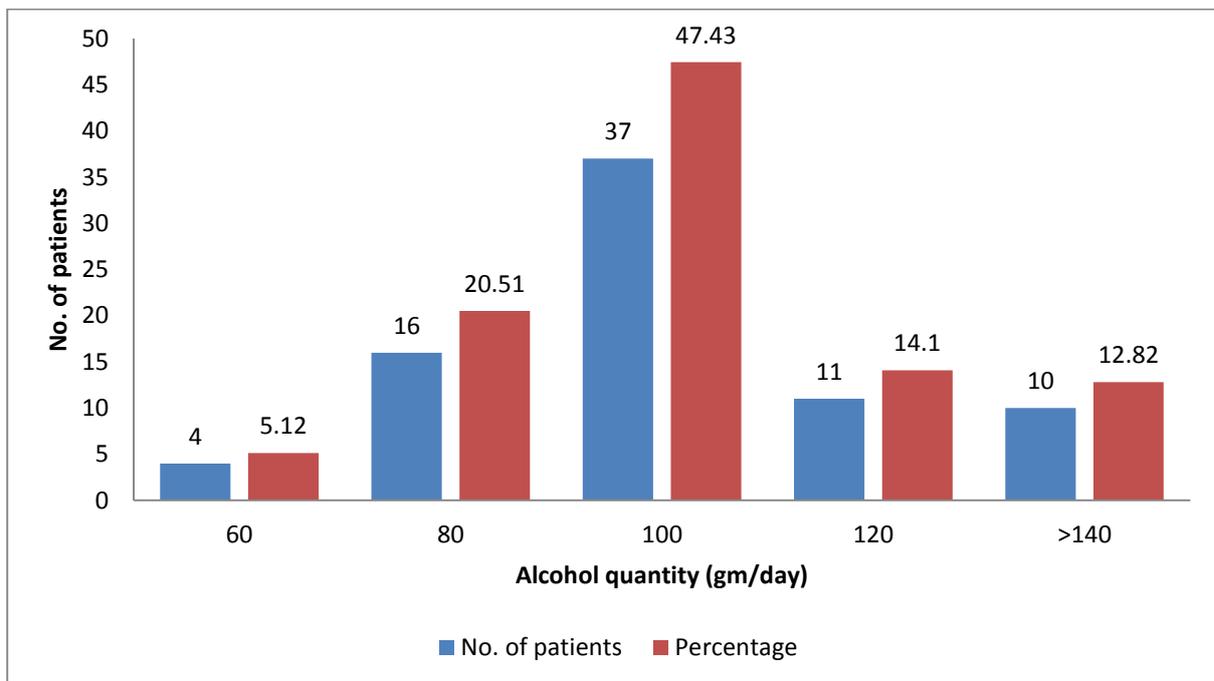


Figure 03: Alcohol quantities among regular alcoholics versus percentage of patients

CONCLUSION

Alcohol without abstinence is a strong predictor of cardiac death. This suggests that a more aggressive approach to alcohol cessation is needed in these patients. Patients with dilated cardiomyopathy should be advised to minimize the alcohol intake or give up alcohol totally.

A clinical pharmacist has enormous responsibility in educating the general population as well as the patients about the harmful effects of alcohol on health, addictive nature of alcohol and how abstaining from alcohol will reduce the risk of many cardiovascular disorders. This is important because alcohol is at the top of the list of avoidable risk factors for a disease.

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