

**A STUDY ON THE EFFECT OF DIET & LIFE STYLE ON THE
INCIDENCE OF CORONARY ARTERY DISEASE IN
MODERATELY DRINKING EX MILITARY MEN IN
PATHANAMTHITTA DISTRICT.**

EXECUTIVE SUMMARY OF THE MINOR RESEARCH PROJECT

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BY

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Coronary Artery disease (CAD) or atherosclerotic heart disease is the end result of the accumulation of atheromatous plaques within the walls of the coronary arteries that supply the myocardium (the muscle of the heart) with oxygen and nutrients. It is sometimes also called coronary heart disease (CHD), although CAD is the most common cause of CHD, it is not the only one. CAD is the leading cause of death worldwide, with highest rates of CAD observed in Asian countries, particularly South Asia. The disease is the most common cause of sudden death, and is also the most common reason for death of men and women over 20 years of age. CAD is associated with smoking, diabetes, and hypertension. A family history of early CAD is one of the less important predictors of CAD.

The confirmed independent risk factors for the development of CAD are a) Hypercholesterolemia (specifically, serum LDL concentrations), b) Smoking, c) Hypertension, d) Hyperglycemia, e) Type A Behavioral Patterns, f) Haemostatic Factors, g) Hereditary differences in lipid metabolism and h) High levels of Lipoprotein (LPa) . Elevated lipid levels specifically, LDL cholesterol and triglyceride levels and diminished levels of HDL cholesterol have been shown to be good indicators of the CAD risk . The plasma lipid levels has been shown to be highly associated with fat-rich diet and a general lack of exercise from large scale studies from Western population as well as from several studies from India.

Reviews of research evidence report a strong, consistent relationship between moderate alcohol consumption and reduction in cardiovascular disease in general and CAD in particular . Very significant reduction of CAD risk has been observed among moderate alcohol consumers compared to the non-drinking population. The Nutrition Committee of the American Heart Association has even reported that lowest mortality rate is observed among moderate alcohol consumers. The same conclusion was reached by a Technical Committee on Cardiovascular Diseases constituted by the World Health Organization (WHO) . The beneficiary effect of healthy alcohol consumption was known for long with evidence that moderate consumption of alcohol was associated with a decrease in the risk of heart attack and the evidence of health benefits of moderate consumption has continued to grow over time.

Though there are many possible modes by which alcohol confers cardio-protective effect the one of the detectable event is the alteration in lipid profile due to moderate consumption of alcohol; moderate consumption leads to elevation in HDL (also referred 'good cholesterol') levels also it can also lower LDL (also referred 'bad cholesterol') by about 4% to 8% . Moderate consumption is generally defined as one to two drinks per day for men .

Most of retired military persons consume alcohol at moderate level. But the incidents of heart diseases are not less when compared to the moderate consumption of alcohol. This may partly be due to the dietary habits (consumption of meat, egg, and fried food materials) and the sedentary life style after retirement. It is suspected that lifestyle factors act as modifiers in such beneficial effect and sedentary lifestyle and a diet rich in saturated fat has been suggested to negate the beneficial effect of moderate alcohol consumption. Hence in the proposed study an attempt was made to evaluate the effect of diet and life style on the incidents of CAD in moderately drinking Ex-servicemen.

Subjects for evaluation were selected from various parts of Pathanamthitta –Dist. The study was performed as per guidelines of modified Helsinki declaration (2008) with respect to human subjects. Institutional ethical clearance was obtained for serum analysis. Consenting volunteers were interviewed on a standard questionnaire addressing questions pertaining to clinical history, vital parameters, alcohol and tobacco consumption and lifestyle habits. 101 persons were interviewed and based on the response 71 qualified as moderate drinkers (consuming ≥ 8 standard drinks a week, calculated based on frequency and volume of intake). Lipid profiling was performed only from moderate drinkers. 4 ml of blood was collected and subsequently were dispersed into two vials, for generating serum and plasma respectively.

11 of 71 moderate drinkers' harbored symptoms of CAD (viz. history of heart attack, stroke, angioplasty and angina along with altered ECG) and these subpopulation were classified as *CAD respondents*. Similarly 23 moderate drinkers responded to harbor a good overall general health including normal blood pressure and fasting blood glucose and this subpopulation was classified as '*Goodhealth respondents*'. 26 respondents harbored either an elevated blood pressure or had CAD like symptoms (i.e., the *CAD respondents*) and were considered as *susceptible-health respondents*.

The survey identified that 36.7% of all the study subjects had elevated blood pressure, similar to the general population in the state (38.9%, persons aged above 55 years; ICMR 2008). Similarly, 15.8% of all the participants responded with a heart related ailments, comparable to the general prevalence in the population (7.4 - 11% in Keralaites, *CSI Kerala CRP Study*); thus confirming the absence of a protective effect of moderate drinking among the ex-service men.

Lipid profiling of the moderate drinkers revealed that the respondents harboring CAD like symptoms harbored higher total cholesterol (though insignificant), as well as elevated (only weakly significant) triglyceride levels compared to moderately drinking respondents with general good health. Similarly the triglyceride levels were found significantly elevated ($p=0.025$) in respondents with generally adverse cardiovascular health, compared to the respondents with good general health, thereby indicating that the lipid profile of the moderate drinkers were modulated by other lifestyle habits.

Interestingly, the two major lifestyle factors, viz. diet and exercise, were found to be modulators of the lipid profile among the moderate drinking cohort. The respondents with CAD like symptoms were having relatively sedentary life style ($p=0.013$) compared to the respondents with general good health, however, fat-rich diet was not significantly associated. Nevertheless, it is likely that the respondents with CAD symptoms were devoid of vigorous exercise as a result of the general poor health condition. Interestingly, the respondents with relatively poor cardiovascular health also were less likely to have vigorous exercise ($p=0.0003$) and also were having a fat-rich diet ($p=0.088$), compared to the respondents with general good health. This indicated that among the moderated drinkers, a poor cardiovascular health (also risk factor for CAD), was more likely associated with sedentary lifestyle and fat-rich diet. Importantly, lack of vigorous exercise was significantly associated with higher HDL levels ($p=0.008$) and to a relatively lower extend to low LDL ($p=0.064$) levels. In contrast, fat-rich diet was associated with lower HDL levels ($p=0.025$) and with elevated TG (0.073) levels. Taken together, the data indicates that the combination of the two lifestyle factors in the study, viz. exercise and diet, were likely acting as modulators of the lipid profile. Of note, the lipid profiles were associated (though only weak association) with the cardiovascular health as well as CAD in our study.

Our study had a few limitations. A few of the parameters in the study were based on self reporting which included the symptoms of CAD. We could not perform detailed analysis using ECG or echocardiography which could have been more confirmatory in nature, due to lack of resources. The study was performed on a smaller sample size which would have affected the association analysis. However, the study was performed from ex-servicemen, who form a relatively uniform cohort and who were all able-bodied in the prime of their life. Similarly, the CAD affected individuals were relatively smaller in number to make a specific analysis on the affect of lifestyle on associated lipid profile. Since the sample size was smaller, we expanded the analysis to general cardiovascular health, even though the cardiovascular health may not directly reflect the CAD risk. In addition, many of the respondents were using cholesterol and blood pressure lowering drugs, whose effect had to be discounted in the study. Additionally, we did not take into consideration other modifiers including diabetes, obesity or body mass index (BMI). Taken together our results are only indicative in nature and a further large scale analysis involving large sample size is necessary for identifying the beneficiary (or lack thereof) effect of moderate alcohol consumption on cardiovascular health.

It has been widely acknowledged that moderate consumption of alcohol confers protective effect on cardiovascular health in the general population, especially by lowering the lipid levels, on the background of several studies from the West. However, such associations have rarely been studied from India, which has stark differences in ethnicity from many of the Western population. The study was conducted from 101 consenting retired military personnel from the Indian Armed forces hailing from Pathanamthitta District in India and included a survey based on detailed questionnaire and subsequent screening of lipid profile from blood. But the incidents of heart diseases apparently are not less when compared to the moderate consumption of alcohol.