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The Association between Tobacco Smoking and Coronary Heart Disease in Autopsy Cases

[1]Dr Minakshi Rajput, [2]Dr Sunil Jaiswal, [3]Dr Sandeep Bhandari, [4]Dr jitha Shaju, [5]Dr Biji Anita john

***Corresponding Author:**
Dr. Sunil Jaiswal
22, Ashish Regency Ring Road Pipliahana Square, Indore Madhya Pradesh
Sunilswetsjaiswal@gmail.com

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ABSTRACT

Background: Coronary artery disease is an important cause of morbidity and mortality in developed and developing countries. Cigarette smoking is thought to be major risk factor.

Aim: The association between tobacco smoking and coronary heart disease and myocardial infarction

Methods: A Retrospective and Prospective histopathological study of five yrs cases of coronary vessels of MI patients and their corellation was done .study was done in the Department of Pathology and Department of forensic medicine, M.G.M medical college and M.Y Hospital, Indore.

Results: This study showed that the occurrence of coronary artery disease was higher in the smokers 69.5% and 30.5% in non smokers. Increased levels of nicotine may be a contributory factor to atherosclerosis which is observed in smokers.

Conclusion: Cigarette smoking not only accelerates the early onset of coronary artery disease but also increases the risk of the development of coronary artery disease by more than 80%.

Keywords: Coronary artery disease, smoking

INTRODUCTION:

Smoking is a major cause of cardiovascular disease (CVD) and causes approximately one of every four deaths from CVD. CVD is the one of the single largest cause of death and killing more than 800,000 people a year. Almost 8 million have had a heart attack and 7 million have had a stroke.[1] Even people who smoke fewer than five cigarettes a day may show signs of early CVD. The risk of CVD increases with the number of cigarettes smoked per day, and when smoking continues for many years. Smoking cigarettes with lower levels of tar or nicotine does not reduce the risk for cardiovascular disease. Exposure to second hand smoke causes heart disease in nonsmokers. More than 33,000 nonsmokers die every year in the United States from coronary heart disease caused by exposure to second hand smoke. Exposure to secondhand smoke can also cause heart attacks and strokes in nonsmokers. [2]

How Smoking Harms The cardiovascular System
-Chemicals in cigarette smoke cause the cells that line blood vessels to become swollen and inflamed. This can narrow the blood vessels and can lead to many cardiovascular conditions. ln Atherosclerosis, in which arteries narrow and become less flexible, occurs when fat, cholesterol, and other substances in the blood form plaque that builds up in the walls of arteries. The opening inside the arteries narrows as plaque builds up, and blood can no longer flow properly to various parts of the body. Smoking

increases the formation of plaque in blood vessels.Coronary Heart Disease occurs when arteries that carry blood to the heart muscle are narrowed by plaque or blocked by clots.[3] Chemicals in cigarette smoke cause the blood to thicken and form clots inside veins and arteries. Blockage from a clot can lead to a heart attack and sudden death. Stroke is a. The aorta is the main artery that carries oxygen-rich blood throughout the body. Smoking is a known cause of early damage to the abdominal aorta, which can lead to an aneurysm.[5]Smoking and dynamic Coronary Obstruction Several lines of evidence suggest that smoking related coronary disease mortality is predominantly related to its adverse effects on occlusive phenomena, ie, coronary vasomotion, platelet aggregation, and coronary thrombosis[6]. Smoking and Coronary Vasomotor Reactivity Acute cigarette smoking tends to increase myocardial O2 consumption by increasing heart rate and blood pressure and this is accompanied by a commensurate increase in the coronary blood flow in normal subjects, but with no increase or actual decrease in coronary blood flow in subjects with coronary atherosclerosis.[7] Over the long term, smokers tend to have reduced maximal coronary vasodilator or flow reserve in the presence as well as the absence of angiographic signs of coronary atherosclerosis.[8] These observations are in keeping with a vasoconstrictor effect of smoking on the large epicardial or small resistance coronary blood vessels.[9]Reduced coronary vasodilator reserve in chronic smokers may in addition, be due to the thickening of walls of intramyocardial arterioles, a consequence of smooth muscle cell proliferation.[10,11] .endothelial damage and consequent reduction in endothelial dependent vasodilation and a-adrenergic stimulation have all been implicated. [12]Smoking and Platelet Function Platelets appear to be important mediators of intermittent or permanent coronary occlusion at sites of fissured atherosclerotic plaques and areas of endothelial injury [9]. Smokers have been shown to have an elevated leukocyte count and it is conceivable that this may be one of the ways smoking adversely influences outcome in coronary artery disease.[13,14] direct Myocardial Effects of Smoking may adversely affect myocardial function independent of its effects on coronary vasculature. The possible existence of such a "smoker's cardio myopathy" is suggested by an experimental study involving rabbits and a cross-sectional study of human subjects in which smokers were shown to have a greater prevalence of diffuse left ventricular hypo kinesis than could be accounted for by severity of coronary artery disease. F-" Smoking may also have an arrhythmo genic effect, perhaps related to increase in free-fatty acids and sympatho-adrenal activation.

Materials And Methods: our study is an Retrospective and Prospective 5 yrs study performed in the Department of Pathology, M.G.M medical college and M.Y Hospital, Indore on 200 cases based histopathological analysis of autopsy specimen(Heart) received in our department and their association of smoking history as per record. For Retrospective study: Case sheet and reports used and for Prospective study we receive specimen containing submitted to the department of pathology, M.G.M. Medical college, Indore. We included sealed container and well preserved in formalin- with labeling of specimen, seal namuna of police station, panchnama report and hospital documemts, if H/O of hospitalization present and we excluded autolytic sample. gross examination done inflow and outflow method is used for Grossing of heart and for microscopic examination H&E staining method was used.

Result and Observation: In our study out of 200 cases of myocardial infarction 139(69.5%) cases are smokers and 61(31.5%) cases are Non smokers.

	NO OF CASES	**Percent**
SMOKERS	139	69.5%

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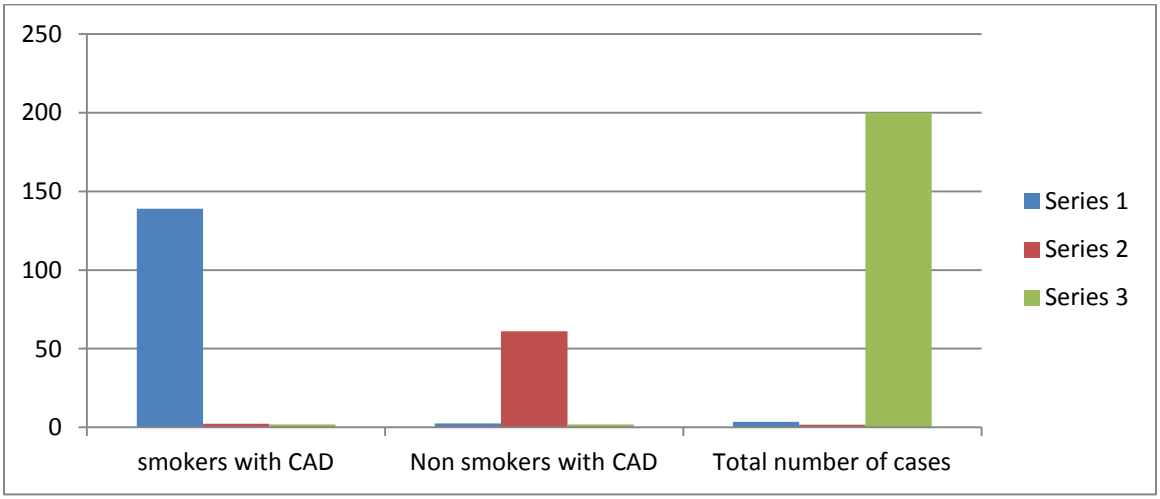
NONSMOKERS	61	30.5%
Total	200	100%

Table 1: Distribution of cases according to smoking habit(as per personal history of hospital record)



Discussion-The burden of smoking-attributable disease and premature death and its high costs to the nation will continue for decades unless smoking prevalence is reduced more rapidly than the current trajectory. Trends in smoking rates among youth and adults show progress, but the prevalence of current smoking among youth and adults is only slowly declining and the actual number of youth and young adults starting to smoke has increased. Additionally, the use of multiple tobacco products is increasingly common, especially among young smokers. Concerns remain that use of these new products may increase initiation rates among youth and young adults, delay quitting, and prolong the smoking epidemic[13].

This increase has occurred despite decreases in per capita cigarette consumption and prevalence of smoking, emphasizing our enhanced understanding of the increased lethality of cigarettes. The high risks of cigarette smoking and the historic and current patterns of tobacco use in the United States lead to a primary conclusion of this report: • The burden of death and disease from tobacco use in the United States is overwhelmingly caused by cigarettes and other combusted tobacco products; rapid elimination of their use will dramatically reduce this burden.[14]

Large increases in IHD throughout the world are projected, and IHD is likely to become the most common cause of death reduction in the mortality which was caused by CAD over the past 3 decades.[15]

In stusy of Reuel A Stallones, M.D.The peak incidence of coronary artery disease was in the age group of after 40 years. The average age of the start of smoking was nearly 24.8±4.2 in all the age groups. The number of cigarettes in each group on an average was 15.8±3.8 per day. The duration of smoking on an average was 25.7±3.6 years. The earlier the age of the start of smoking, the more was the number of cigarettes smoked, the longer was the duration of smoking and the longer was the end inspiratory breath holding and all these factors were found to increase the risk of development of coronary artery disease. In the present study, we considered socio-demographic, cardio-metabolic, behavioural and psychosocial risk factors. As the study was age group and sex matched, in bivariate analysis, among the risk factors, age and sex were not associated with CAD because of their similar values in both case and control groups. Although hypertension is a well-established risk factor among the cardio-metabolic risk factors[23] . In a Pakistani population, smoking (29.2%), predominantly in males, has been reported among patients with CAD.[24]

Although the risk of developing CAD was higher in males than in females,4 female smokers were more

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prone to CAD than their male counterparts.25 We found that current smoking and ex-smoking were related to CAD in both sexes. Additionally, in a Chinese population, current female smokers had a greater risk of heart attack than non-smokers and ex-smokers.[25]

In present study when the age was categorized, as per autopsy study aged <50 years had a higher chance of developing CAD. South Asian populations, especially Indian populations, in the young age group were more susceptible to CAD. The most commonly associated risk factor in young CAD patients was smoking.[27] In a hospital-based observational study, more smokers were in the CAD group with young adults suspected of coronary artery disease at ≤35 years of age.[26] In our study Smoking was inversely related to education among males but Additionally, in the present study, A family history of coronary heart disease adjusted for age, sex, smoking, In our study, smoking was also found to be associated with a family history of CAD.

When stratified by alcohol use as "yes" or "no", smoking seemed to be strongly associated with CAD in the present study as per histry taken from relative of deceased.

Smokers have an increased risk of coronary heart disease, which is dependent on the number of cigarettes smoked daily and the number of years they have smoked.33 In this study, the number of average cigarettes per day, total duration of smoking and length of quitting were associated with CAD risk. Consistent with this study, current smokers who smoked more than 15 cigarettes per day were found to have a significantly increased risk of CAD.

Conclusion: Smoking increases the risk for the development of CAD in more than 70% cases. The present study confirmed that smoking was an important risk factor for CAD and myocardial infarction in the autopsy cases confirmed by histopathological analysis.

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