ORIGINAL ARTICLE

A prospective comparative study on myocardial infarction in smokers and non-smokers

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Abstract

Objectives: To analyze the correlation between smoking status (smokers and non-smokers) and various health parameters, including age, chest pain, breathing difficulties, perspiration, and hypertension. The goal is to understand the impact of smoking on cardiovascular health. **Materials and Methods:** A prospective cohort study was designed and conducted at a third-level healthcare center in Rajahmahendravaram for a period of 6 months with sample size of 100 inpatients and outpatients visiting to the general medicine department. We included both male and female patients aged between 25 and 75 years. This study did not include women who were pregnant or nursing. **Results:** A total of 100 patients were examined based on both inclusive and exclusive criteria. Among the study population, male patients (83%) were more prone to myocardial infarction (MI) than the female population (17%). A large portion (74%) of smokers falls within the 31–60 age group and only (25%) of smokers are in 61–90 age group. Chest pain was experienced by (71%) of the smokers nearly double the rate of non-smokers (39%). Smokers (68%) report shortness of breath much more frequently than non-smokers (26%). Sweating was experienced by (72%) of smokers and (39%) by non-smokers. The prevalence of hypertension is higher in smokers (64%) than in non-smokers (30%). **Conclusion:** We found that a strong correlation between smoking and a range of serious health issues. Across our study we found out that male smokers age ranges from 30 to 60 years were more prone to MI than non-smokers. Through preventive measures, cessation programs, and public health campaigns on smoking is crucial for improving public health.

Key words: Chest pain, hypertension, myocardial infarction, shortness of breath, smoking

INTRODUCTION

Myocardial infarction (MI) is a heart attack caused by plaque buildup in arteries, which reduces blood flow and causes heart muscle damage due to a lack of oxygen delivery. Chest discomfort, dyspnea, sweating, anxiety, heart palpitations, nausea, vomiting, fatigue, weakness, stress, and depression are the symptoms of MI.[1] MI can be a mild, undiagnosed incident in chronic conditions or a massive catastrophic event that results in rapid death or severe hemodynamic impairment.[2] Risk factors include smoking, abnormal lipid profiles, hypertension, diabetes, abdominal obesity, psychosocial stress, lack of physical activity, and alcohol consumption.[3]

Smoking increases myocardial oxygen demand, which raises blood pressure and heart rate while decreasing coronary artery size and coronary blood flow. Smoking negatively impacts the clinical outcomes of patients with acute MI.[4] Tobacco smoking increases the risk of MI in both men and women, with inhalers experiencing a larger risk than non-inhalers.[5] Smoking significantly increases risk by 2–3% for every gram of tobacco smoked daily, according to a dose-dependent study. Smokers with both STEMI and NSTEMI had a significantly increased chance of experiencing another MI within a year.[6] Within 3 years of cessation of smoking, this risk decreases significantly compared to non-smokers.[7]

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MI is a significant global health issue causing significant illness and mortality rates. NSTEMI is more prevalent than STEMI, accounting for nearly 15% of annual deaths in most cases.[8] The global incidence of MI s is 32.4 million annually. In India, the prevalence of MI in men aged 29–69 is 64.37/1,000. MI is the cause of 31.7% of deaths in India.

Aims and Objectives

To analyze the correlation between smoking status (smokers and non-smokers) and various health parameters, including age, breathlessness, chest pain, sweating, and hypertension. The study aims to comprehend the influence of smoking on cardiovascular health.

MATERIALS AND METHODS

Methodology

The study, conducted over 1 year at a tertiary care hospital, involved 100 inpatients and outpatients visiting the general medicine department. The study included patients with MI, both male and female, aged 25–75 years. This study excluded women who were pregnant or nursing.

Sources of Data Collections

Data were collected after filling out the informed consent form of each patient. Data were directly collected from patient's case sheets, interviews of patients and their representatives, patient admission records, and pathology records. A data collection form that was specifically created was used to document the information gathered. The analysis was done after the data were entered into the MS Excel sheet. We statistically analyzed the data using Fisher's exact test to assess the association among various variables (categorical and continuous).

RESULTS

Gender-Wise Distribution

Among the 100 patients in the study, MI was seen in 74 smoking and 9 non-smoking male patients, and 3 smoking and 14 non-smoking female patients. Table 1 describes that the male patients are significantly more affected, comprising 83% of the study and the female patients made up only 17%.

Age Distribution

Out of a total of 100 patients, 67 patients were from the age group of 31–60, that is, (67%) and 33 patients were aged 61–90, accounting for 33%. Table 2 suggests that middle-aged individuals who smoke are at a higher risk of myocardial infarction. The statistical $P = 0.0106$. The significance level is $P < 0.05$.

Smokers and Non-Smokers with or without Chest pain

In our study, we observed that out of 77 smokers, 55 were suffering with chest pain, that is, (71%), and out of 23 non-smokers, 9 were suffering with chest pain, that is, (39%). Out of a total of 100 patients, 64 patients were suffering from chest pain (64%). Smokers were nearly twice as likely to experience chest pain compared to non-smokers as detailed in Table 3.

The statistical $P = 0.0066$. $P < 0.05$ indicates that the result is significant.

Smokers and Non-Smokers in Correlation with Presence or Absence of Shortness of Breath

In the study out of 77 smokers, 53 smokers were suffering with shortness of breath, that is, (68%) and out of 23 non-smokers, 6 were suffering from dyspnea, that is, 26%. Out of total 100 patients 59 patients were suffering with short ness of breath, that is, (59%). Table 4 presents the correlation between smoking status and presence of shortness of breath. Shortness of breath was significantly more common in smokers, with more than the double the rate compared to non-smokers. The statistical $P = 0.0005$. At $P < 0.05$, the result is significant.

Smokers and Non-Smokers in Correlation with Sweating

In the study, out of 77 smokers, 56 were present with sweating, that is, (72%) and out of 23 non-smokers, 9 were present with sweating, that is, (39%). Out of total 100 patients 65 patients were suffering with sweating, that is, (65%). Table 5 analyses that the sweating was significantly more prevalent in smokers and non-smokers. The statistical $P = 0.0054$. At $P < 0.05$, the outcome is significant.

Smokers and Non-Smokers in Correlation with Hypertension

In the study, out of 77 smokers, 50 patients had hypertension, that is, (64%), and out of 23 non-smokers, 7 patients had hypertension, that is, (30%). Out of a total of 100 patients, 57 patients were suffering with hypertension, that is, (57%). Hypertnsion was more than twice as compaed in smokers compared to non-smokers as detailed in Table 6. The statistical $P = 0.0042$. The result is statistically significant at $P < 0.05$.

Table 1: Distribution by gender

Gender	Smokers	Non-smokers	Row total
Male	74	9	83
Female	3	14	17
Total	77	23	100

Table 2: Age distribution

Age	Smokers	Non-smokers	Row total
31–60	57	10	67
61–90	20	13	33
Total	77	23	100

Table 3: Smokers and non-smokers in relation to the presence or absence of chest pain

Chest pain	Smokers	Non-smokers	Row total
Present	55	9	64
Absent	22	14	36
Total	77	23	100

Table 4: Smokers and non-smokers in correlation with presence and absence of shortness of breath

SOB	Smokers	Non-smokers	Row total
Present	53	6	59
Absent	24	17	41
Total	77	23	100

Table 5: Smokers and non-smokers in correlation with sweating

Sweating	Smokers	Non-smokers	Row total
Present	56	9	65
Absent	21	14	35
Total	77	23	100

Table 6: The relationship between smoking and non-smoking and hypertension

Hypertension	Smokers	Non-smokers	Row total
Present	50	7	57
Absent	27	16	43
Total	77	23	100

DISCUSSION

MI is more common in men than in women across all age groups.[8] In our study, among the 100 patients, 83 were male and 17 were female, with a significantly higher number of males affected by MI. Male smoking, a known risk factor for MI, could be the cause of the gender gap in smoking rates.

MI is a common heart condition that primarily affects people over the age of 45, though it can also affect younger men and women.[9] In this study, a significant proportion (74%) of smokers falls within the 31–60 age group, suggesting that smoking is more prevalent among middle-aged individuals. In contrast, only 25% of smokers belong to the 61–90 age group, which may reflect a decrease in smoking habits as individuals age, likely due to increased health awareness. Non-smokers, on the other hand, are more evenly distributed across age groups, with 56% in the older 61–90 range, indicating that older adults are more likely to have either quit smoking or never started.

For patients experiencing chest pain, age is a significant predictor of acute myocardial infarction. Male patient, aged 41–70 years, experiencing severe chest pain.[10] In this study, smokers were nearly twice as likely to experience chest pain (71%) compared to non-smokers (39%). Smoking is strongly linked to cardiovascular problems, contributing to the development of atherosclerosis and other cardiovascular diseases.

As people age, common crushing substernal chest pain diminishes, but dyspnea symptoms progressively worsen.[11] In this study, a greater proportion of smokers (68%) report experiencing shortness of breath, compared to only (26%) of non-smokers.

Sweating is significantly more common in smokers (72%) than non-smokers (39%). This symptom may be linked to the strain smoking places on the cardiovascular system, leading to heightened stress responses. Smokers have a much higher prevalence of hypertension (64%) than non-smokers (30%).

Smoking increases the risk of long-term cardiovascular diseases by narrowing blood vessels and increasing heart rate. Treatment involved antiplatelets, anticoagulants, fibrinolytics, thrombolytics, antianginals, Calcium channel blockers, angiotensin-converting enzyme (ACE) inhibitors, statins, and beta blockers, with ARB + thiazides combinations also prescribed. Calcium channel blockers were the most used antihypertensives, while ACE inhibitors were the least prescribed. Symptom severity decreased after treatment, but non-smokers showed faster recovery and required lower doses of therapeutic drugs compared to smokers. Smokers exhibited prolonged recovery periods and less responsiveness to treatment.

CONCLUSION

MI presents with different outcomes in smokers compared to non-smokers. Variations were observed in severity, symptoms, and recovery between the two groups. Based on the analyzed data, smokers are more susceptible to MI.

Smoking increases the incidence of MI and slows down recovery compared to non-smokers, as seen by symptoms

including chest discomfort, shortness of breath, and heavy perspiration. It was also shown that female patients perspire more than male ones. Female smokers reported higher anxiety levels than non-smokers, indicating that smoking exacerbates anxiety in patients.

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