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Evaluation of risk factors in cases of myocardial infarction in adult population

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DOI: https://doi.org/10.22271/27069567.2019.v1.i1a.9

Abstract
Background: The present study was conducted to assess risk factors in cases of myocardial infarction in adult population.
Materials & Methods: The present study was conducted on 68 cases of myocardial infarction of both genders. A through clinical examination was done in all patients. Risk factors and kind of MI was recorded.
Results: Out of 68 patients, males were 42 and females were 26. Risk factors were hypertension seen in 12, diabetes mellitus in 14, high cholesterol in 18, cigarette smoking in 40, renal dysfunction in 1 and previous coronary artery disease in 5. The difference was significant ($P < 0.05$). Kind of MI was anterior in 20, inferior lateral in 6, inferior in 32, anterior septal in 7 and other MI in 3. The difference was significant ($P < 0.05$).
Conclusion: Authors found that kind of MI was anterior, inferior lateral, inferior, anterior septal. Risk factors of MI were hypertension and diabetes mellitus, previous history of coronary heart disease, high cholesterol and cigarette smoking.

Keywords: Diabetes mellitus, Hypertension, Myocardial infarction

Introduction
Myocardial infarction represents death of myocardial cells due to irreversible ischemia progressing to necrosis. According to the World Health Organization's estimates, every year approximately 6 million people around the world experience a myocardial infarction, and the lethal outcome occurs in over 25% of cases. Coronary heart disease (CHD) is the most common serious disease in industrialized communities and a fast developing health problem in developing countries [1]. These diseases have caused mortality in developed countries more than other diseases and impose numerous social and economic costs. These diseases are now seen in countries with low or average income which also have the majority of population.
It is estimated that around two thirds of the myocardial infarction mortality rates decline in developed countries are due to reduced exposure to risk factors, while the last third is the result of adequate treatment and improved survival [2].
Clinically cigarette decreases high density lipoproteins (useful lipids) and increases low density lipoproteins (harmful lipids) and blood glucose. Reduce in serum cholesterol average and hypertension after CAD has been proved [3]. Clinically cardiac enzymes and ECG can be one of ways of diagnosing heart failure. Cardiac enzymes changes can be observable in ECG of myocardial infarction patients. Cardiac troponin is the only recommended biomarker for the detection of myocardial necrosis, and it is integral to the diagnostic criteria for myocardial infarction. The case-fatality rate of AMI is particularly high among patients with accompanying severe arrhythmia, shock, or heart failure [4]. The present study was conducted to assess the risk factors in cases of myocardial infarction in adult population.

Materials and Methods
The present study was conducted in the department of Internal Medicine. It comprised of 68 cases of myocardial infarction of both genders. All were informed regarding the study and written consent was obtained. Ethical clearance was obtained prior to the study.
General information such as name, age, gender etc. was recorded. A through clinical examination was done in all patients. Medical history (history of myocardial infarction, hypertension, and/or diabetes), predisposing factors such as pulmonary infection, physical

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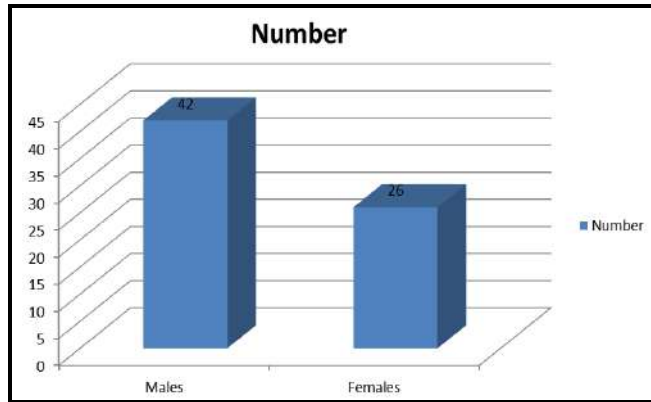activity, unstable mood, vomiting, and urination etc. were recorded. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I: Distribution of patients

Total- 68		
Gender	**Males**	**Females**
Number	42	26

Table I, graph I shows that out of 68 patients, males were 42 and females were 26.

Graph I: Distribution of patients

Table II: Risk factors in patients

Risk factors	Number	P value
Hypertension	12	
Diabetes mellitus	14	
High cholesterol	18	
Cigarette smoking	40	0.01
Renal dysfunction	1	
Previous coronary artery disease	5	

Table II, graph II shows that risk factors were hypertension seen in 12, diabetes mellitus in 14, high cholesterol in 18, cigarette smoking in 40, renal dysfunction in 1 and previous coronary artery disease in 5. The difference was significant ($P< 0.05$).
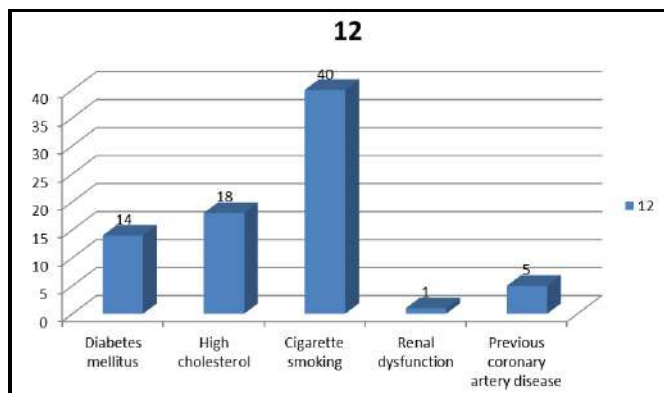
Graph II: Risk factors in patients

Table III: Kind of MI

Kind	Number	P value
Anterior	20	
Inferior lateral	6	
Inferior	32	0.01
Anterior septal	7	
Other MI	3	

Table III shows that kind of MI was anterior in 20, inferior lateral in 6, inferior in 32, anterior septal in 7 and other MI in 3. The difference was significant ($P< 0.05$).

Discussion

The majority of cardiac troponin is intracellular, with >90% of troponin isoforms located within the sarcomere, and the remainder unbound within the cytoplasmic pool. The mechanisms of cardiac troponin release into the circulation are thought to include myocyte necrosis, apoptosis, formation and release of membranous blebs, increased membrane permeability and release of proteolytic troponin degradation products. Cardiomyocytes undergo mechanical stretch in response to pressure or volume overload, and this may trigger activation of intracellular proteases associated with intracellular degradation of troponin. Furthermore, there is evidence that tachycardia may stimulate stress-responsive integrins within the cardiomyocyte, triggering release of intact cardiac troponin I from viable cardiomyocytes in the absence of necrosis [5]. The present study was conducted to assess the cases of myocardial infarction in adult population.

In present study, out of 68 patients, males were 42 and females were 26. Aghaeishahsavari et al. [6] found that total of 68 patients were enrolled in observed group with 59 patients enrolled in control group. 48 (70.6%) of observed group had complicated infection and 43 (72.9%) of control group, respectively. The mortality of observed group was 17.65%, lower than 33.90% of control group.

We found that risk factors were hypertension seen in 12, diabetes mellitus in 14, high cholesterol in 18, cigarette smoking in 40, renal dysfunction in 1 and previous coronary artery disease in 5. Smoking is considered to be strong risk factor of myocardial infarction, premature atherosclerosis and sudden cardiac death. Smoking results in early STEMI especially in otherwise healthier patients. Cigarette smoking increases the risk for AMI by multiple and complex mechanisms. With respect to atherogenesis, smoking increases serum LDL-cholesterol and triglyceride concentrations and reduces serum HDL-cholesterol. Furthermore, cigarette smoke promotes free radical damage to LDL, leading to accumulation of oxidized LDL-cholesterol within the arterial wall. Smoking appears to contribute vascular inflammation characteristic of atherosclerosis, as reflected by higher serum C-reactive protein levels in smokers than in nonsmokers [7].

Patients with frequent pain attacks should be managed with a nitroglycerin intravenous drip as nitrates can dilate veins; cardiac preload, left ventricular end-diastolic pressure and myocardial oxygen consumption should be reduced, and left ventricular function improved locally and globally. Nausea and vomiting in AMI patients are associated with stimulation of the vagus nerve by the necrotic myocardium and with inadequate tissue perfusion due to decreased cardiac output. Nurses should ensure the frequent small meals and snacks of patients and keep the stomach warm. If necessary, metoclopramide tablets may be taken to reduce vomiting [8].

Type 2 diabetes mellitus is on the verge of becoming a pan-demic in India. It is a chronic condition that occurs when the body can not produce enough or effectively use of insulin,

and are induced by a genetic predisposition coupled with environmental factors [9]. As type 2 diabetes shares several risk factors in common with coronary artery disease (CAD), such as age, hypertension, dyslipidemia, obesity, physical inactivity and stress, an increase in the prevalence of diabetes indirectly implicates an escalating risk of CAD as well. Both systolic and diastolic hypertension increase the risk of a myocardial infarction and the higher the pressure, the greater the risk. It is major risk factor of causing athero-sclerosis in coronary blood vessels, result in heart attack or myocardial infarction. Hypertension and myocardial in-farction are closely linked. In old age, hypertension is even worse to heart and responsible for at least 70 percent of heart disease [10].

Conclusion

Authors found that kind of MI was anterior, inferior lateral, inferior, anterior septal. Risk factors of MI were hypertension and diabetes mellitus, previous history of coronary heart disease, high cholesterol and cigarette smoking.

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