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Original Research Article

Risk Factors, Presentation, and In-Hospital Events of Young ST-Elevation Myocardial Infarction Patients

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Abstract

Introduction: The incidence of coronary artery disease among younger people is rising at an alarming pace throughout the Indian subcontinent. There have only been a few of studies that have focused on young ST-elevation myocardial infarction (STEMI) patients in these areas. We investigate the clinical characteristics and therapy of individuals younger than 40 years old who have STEMI.

Methods: Patients with ST-elevation myocardial infarction (STEMI) who were younger than 40 years old and hospitalized in JLNMC, Bhagalpur, Bihar were included in the study. The use of electronic medical records allowed for the collection of data. The ST-elevation myocardial infarction (STEMI) profile, medical history, risk factors, in-hospital events, and therapy all had descriptive statistics derived for them.

Results: In patients who had no previous history of either ailment, the hospital made the diagnosis that they had hypertension 19.5% of the time, and reduced high-density lipoprotein 9.5% of the time. Conclusions: Better screening for risk factors is required among young people who use cigarettes. This population has a high prevalence of health problems. In patients younger than 40 years old who have numerous risk factors, acute cardiac events may be avoided with earlier diagnosis of dyslipidemia and hypertension as well as treatment of these conditions.

Keywords: Very Young, STEMI.

Introduction

Coronary artery disease, often known as CAD, is becoming more widespread in developing nations of the world, where it has a disproportionately negative impact on younger people [1-3]. There have been a number of studies that have evaluated risk factors, clinical presentation, and in-hospital outcomes between younger and older patients who were diagnosed with acute ST-elevation myocardial infarction (STEMI) [2-5]. Patients younger than 40 years old who have STEMI are more likely to have certain risk factors, including male sex, smoking, a family history of the condition, dyslipidemia, hypertension, and Diabetes Mellitus (DM). In

several of these trials, patients of varying ages, including younger and older patients, were treated together [5-9]. When compared with older patients, younger individuals appear with a distinct pattern, which leads to various treatment techniques and results [1,3,5]; There have been a few studies that have focused exclusively on young patients suffering from STEMI on the Indian subcontinent. It is essential to have an understanding of the potential ways in which the clinical profiles and risk factors of young STEMI patients vary from those of their counterparts in the Indian and in other locations in order to establish appropriate treatment strategies for these patients [10,11]. As a result, we investigate the clinical characteristics, risk factors, medical histories, in-hospital events, and death rates of patients younger than 40 years old who were diagnosed with STEMI and treated at JLNMC, Bhagalpur, Bihar. In addition, we compare the history of hypertension, dyslipidemia, and diabetes to the patient's current state in order to assess the proportion of undetected illnesses discovered upon admission.

Methods

Selection and description of participants. A smaller portion of the overall sample for bigger research on the treatment of STEMI from duration of October 2021 to September 2022 in JLNMC, Bhagalpur, Bihar, is used for this investigation. The findings of the more extensive investigation have been published elsewhere [12]. Data were gathered from. 80 participants under the age of 40 were selected from this larger group to take part in the investigation.

Patients had to present themselves at the hospital with ST-elevation myocardial infarction (STEMI), and they had to have had primary percutaneous coronary intervention (PPCI) therapy for coronary flow limitations. These were the inclusion criteria for the whole sample. For this more limited research endeavor, one of the prerequisites for participation was that patients had to be less than 40 years old when they began receiving therapy. The following are the criteria that were used to exclude patients from the study: patients were disqualified from the study if they arrived at the hospital in cardiac arrest, if they did not have a STEMI, if they were treated with thrombolytics or medication only, or if they were referred for immediate coronary artery bypass grafting surgery.

The eligibility of the participants was determined with the use of electronic medical records. With the collaboration of the four participating institutions, informed consent was acquired from all STEMI patients at the time therapy was administered, regardless of whether or not the patients satisfied all of the qualifying requirements. The researcher had access to the individuals' computerized medical data as well as their contact information if they had given their approval. Ineligible individuals were eliminated from the data set at the conclusion of the 18-month period based on the criteria given the whole research and 80 for the current study.

Specific details are provided here.

The use of electronic medical records allowed for the collection of data. Before any data was collected for the research, it was given the go-ahead by an Institutional Review Board at a university and agreement was acquired from the hospitals involved. Patients at the hospital gave their informed, written agreement to participate in the study. The following are the variables that were measured: (1) The demographic factors that were considered were nationality, age (20–29 years, 30–35 years), and gender; (2) door-to-electrocardiogram time, door-to-balloon time, and total ischemia time were included as treatment time factors; (3) treatment variables included STEMI location, number of vessels (single or multiple), and stent type

(bare-metal or drug-eluting). Data were also obtained for 12 medical history factors that are associated with STEMI. These factors include smoking and hypertension (systolic blood pressure 140 mmHg and/or diastolic blood pressure 90 mmHg); five dyslipidaemia risk factors [elevated cholesterol (>5.0 mmol/L), elevated triglyceride (>1.7 mmol/L), decreased high-density lipoprotein (HDL; 1.0 mmol/L), elevated Certain potentially important variables, such as a family history of coronary artery disease (CAD), were unavailable for the current study because the data for this study were drawn from a larger dataset designed to study transportation modes and treatment times among STEMI patients. This larger dataset was designed to study transportation modes and treatment times among STEMI patients. This is one of the limitations that is covered in further depth later on in this essay.

Statistics The purpose of this research was to characterize the clinical characteristics of young STEMI patients as well as the therapeutic modalities that are available to them. Therefore, only descriptive statistical analyses were carried out, and this was also due to the fact that the sample was taken from a larger STEMI sample. The SPSS version 23.0 program was used throughout each and every analysis (IBM Corporation, Armonk, NY, USA).

Results

Demographics: Of STEMI patients aged <40 years, 98.5% (*n* = 75) were men. The majority (85.1%, *n* = 65) were between 30 years and 35 years of age.

Medical history and risk factors

The findings of medical history and risk factors are shown in Table 2. Eighty patients had at least one risk factor that could be modified. At the time of admission, smoking was the most prevalent habit, with 61.0% (n = 50) of patients saying that they were active smokers. The subsequent most prevalent risk factor was hypertension, which was present in 19.5% (n = 20) of the patient population. Only 5 individuals were found to have diabetes. Decreased HDL was found to influence the greatest number of young STEMI patients (70.4%, n = 59), followed by high LDL (29.1%, n = 25), when it came to the risk variables that were tested in the hospital. It has been suggested that a body mass index of 25 or more should define an individual as being obese among Asian ethnic groupings [13]. According to these parameters, the sample's mean BMI is considered to be inside the obese category (Table 1).

Table 2: Young ST-elevation myocardial infarction patient medical history and risk factors.

Variable	*N*	%
Medical history, [a]*n* = 80		
Smoking	50	61.0
Hypertension	20	19.5
Lipid	10	9.5
Percutaneous coronary intervention	10	9.5
Acute myocardial infarction	8	7.5
Diabetes mellitus type 2	5	5.5
Angina	5	5.5
Coronary artery bypass graf	3	1.1

Diabetes mellitus type 1	3	1.1
Stroke	0	0.0
COPD	0	0.0
Dialysis	0	0.0
Risk Factors[a]		
Elevated cholesterol	15	19.5
Elevated triglyceride	13	14.1
Decreased HDL	59	70.4
Elevated LDL	25	29.1
No risk factors	10	12.1
BMI		
Underweight	5	2.4
Normal	10	9.1
Overweight	25	35.0
Obese	40	54.1

STEMI profile and treatment times

Due to the limitations of the research, alternate treatment modalities were not an option for the patients, hence they all got primary percutaneous coronary intervention.

Table 2 presents a cross-tabulation of four lipid statuses (overall cholesterol, triglycerides, LDL, and HDL) according to whether patients had a history of the condition or whether first detection was made at the time of the STEMI event. Elevated LDL and lowered HDL were also concerns; 25.1% and 16.4% of those with no history, respectively, were diagnosed in hospital.

Table 2: Lipid history by hospital profiles.

	History of condition			
Hospital profile	**No**		**Yes**	
	n	**%[a]**	***N***	**%[b]**
Cholesterol				
Elevated	10	14.1	5	7.0
Triglycerides				
Elevated	9	9.5	4	5.9
LDL				
Elevated	18	25.1	7	7.6
HDL				
Low	15	16.4	5	7.0
Not low	55	80.1	4	28.5
Hypertension				
Yes	15	29.5	5	10.5

Discussion and conclusions

This was a multicentre study, in contrast to previous recent studies that characterized the clinical profile of acute myocardial infarction (AMI) among young people in developing countries [8,14]. In addition, to the best of our knowledge, there have been no studies of this kind that have explicitly focused on STEMI among young people. Because ST-elevation myocardial infarction (STEMI) is one of the most prevalent causes of cardiac deaths [15], it is essential to have a solid understanding of the clinical features and risk factors associated with STEMI in young people.

The demographic and STEMI site results are consistent with the findings of previous research [2,6-9,14]. Treatment options have not been investigated in any of the previously conducted research on juvenile AMI patients in places throughout the Indian subcontinent. The rate at which patients in this research were prescribed angiotensin-converting enzyme inhibitors (70.7%) was comparable to the rate that was found in the Acute Coronary Events study (69%) among patients of all ages [17]. However, beta blockers were only administered in 74% of the instances, while 90.7% of patients in our research were given them. In 94% of the instances, aspirin was utilized, while in this research, it was only used 12% of the time. These disparities might be due to country variance or to an increased availability of beta blockers, either of which are possible explanations. On the other hand, they might also be a reflection of a trend toward a concentration on shorter-term therapy, with an increasing emphasis on risk-factor reduction among young AMI patients [6].

There is much evidence that demonstrates the significance of cigarette use as a risk factor among young STEMI patients [7]. According to the findings of this research, smoking was the medical history component with the highest prevalence (61%). This proportion is closely in line with recent studies of young AMI patients from the Indian subcontinent [3,14], confirming the significance of efforts to reduce smoking among the younger population in the Indian subcontinent.

In addition to smoking, having dyslipidemia and hypertension is a significant risk factor for developing early coronary artery disease [7]. A documented history of dyslipidemia was present in less than 10% of the people in our group. However, when the patients were presented with their symptoms, 70.4% of them had low HDL cholesterol and 29.1% had increased LDL cholesterol. In a similar manner, around one-fifth of patients had a history of hypertension, but twice as many patients came with hypertension. This shows that there is a need among young individuals who use cigarettes for enhanced screening for risk factors for coronary artery disease and ST-elevation myocardial infarction (STEMI). The cholesterol status and blood pressure readings taken in the hospital represent the patient's condition at the time of presentation; readings taken after discharge were not available. Because of this, it is probable that the pain of the STEMI event itself produced a brief spike in blood pressure, which accounts for part of the disparity between the patient's history of hypertension and their hypertension when they presented to the hospital. The condition of dyslipidemia is exempt from this restriction. In patients younger than 40 years old who have numerous risk factors, acute cardiac events may be avoided with earlier diagnosis of dyslipidemia and hypertension as well as treatment of these conditions.

The findings of this research are qualified by a number of caveats. To begin, a sample size of 80 people is too small to draw conclusions that are applicable across the board;

subsequent studies should validate results with bigger samples. Second, some potentially crucial characteristics were not accessible for analysis, including the presence of a family history of coronary artery disease (CAD), the presence of genetically increased lipoprotein (A) status [8], and the presence of hypertension at the time of discharge.

In conclusion, the following observations and interpretations may be made based on the findings of the research. Both beta blockers and aspirin were prescribed much less frequently, which suggests that short-term therapy and risk factor reduction are emphasized in this population. First, drug-eluting stents are used more frequently among young STEMI patients than among the broader population. In addition, drug-eluting stents are used more frequently among young STEMI patients than among the broader population. In further longterm studies, the question of whether or not this approach is helpful with younger patients should be investigated. Second, there may be a need for enhanced screening for coronary artery disease and ST-elevation myocardial infarction risk factors among young smokers. These kinds of activities could cut down on the number of early cases of coronary artery disease and acute cardiac events. In conclusion, more study is recommended to be conducted on this group, particularly with regard to the inclusion of other possible factors of interest.

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