MI RISK ASSESSMENT IN PATIENTS USING THE EZ-CVD RISK ASSESSMENT TOOL

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ABSTRACT

Objective: The objective of this study was to assess the myocardial infarction (MI) risk chances among individuals in the productive age group using easy cardiovascular disease (EZ-CVD) risk assessment tool.

Methods: This is a prospective observational and interventional study conducted for 6 months after obtaining the Institutional Human Ethics Committee approval. EZ-CVD risk assessment tool was used in this study which includes six self-reporting questionaries' such as age, gender, history of diabetes, history of smoking, history of hypertension, and family history of heart attack at the age of 60 or younger. A score of 6 or greater is considered as patients are at high risk of having MI.

Results: Sixty subjects were enrolled in to this study using the inclusion criteria. Among them, 36 were male and 24 individuals were female. Out of sixty recruited, 23 found having high risk for MI attack and 37 were at low risk of having chances of further MI.

Conclusion: The study conclude that EZ-CVD risk assessment tool was found useful to predict the occurrence of future MI.

Keywords: Myocardial infarction, Self-reporting questionnaire, EZ CVD risk assessment tool.

INTRODUCTION

Cardiovascular disease (CVD) is one of the global health-related problems and became major cause for the mortality [1]. In 2016, about 17.8 million people died due to CVD and by 2030 it is expected to cause approximately 23 million deaths [2]. CVD refers to a class of clinical conditions such as coronary artery narrowing, stroke, heart failure, hypertensive heart disease, atherosclerosis, and myocardial infarction (MI). People in the age group of 50–65 are at high risk with continuous rise in low- and middle-income countries and slowly emerging MI as an epidemic problem [3,4]. Worldwide, mortality rate is estimated as 30% from 3 million people [4]. Every year, in U.S alone more than 370,000 deaths are occurring due to heart attack [5]. Where as in India, mortality is seen higher and is in over 10 million people. During the past 30 years, the disease rate has increased from 2% to 6% in rural population and 4% to 12% in urban population [6].

MI incidence rate was found significantly high among black men (75–84 years) compared to white among both men (9.1%) and women (7.8%) [7]. Risk of MI is seen 10.62% high in male smokers and 7.38% in non-smokers, whereas 5.88% in female smokers and 2.37% in non-smoker females. Studies conducted in 52 countries shown that men are more prone to high risk compared to women [8]. Age, gender, smoking, high blood pressure, hyperlipidemia, obesity, alcohol consumption family history of heart attack, sedentary life style, stress factors, and comorbidities such as diabetes, COPD, asthma, and chronic kidney disease are considered as risk factors for MI [9]. Globally, many tools are available to assess the risk of MI in the individuals with potential risk factors. One such tool is EZ-CVD tool [10], which is used to assess the risk qualitatively and gives an idea to prevent the MI risk through medical consultation and follow up. The EZ-CVD risk score is an easy-to-use risk score to predict cardiovascular events in adults utilizing only self-reported information without need for further laboratory or physical examination data. The risk score included six variables: Age, sex, a self-reported physician diagnosis of hypertension, diabetes mellitus, smoking, and family history of premature MI and had a similar predictive performance to the guideline-recommended ASCVD risk score. The EZ-CVD risk score could be easily used by physicians, especially at primary care, to assess risk of patients and guide therapeutic decisions regarding statin therapy.

METHODS

This study was a prospective observational study, approved by the Institutional Ethics Committee, and conducted to assess the MI risk in individuals with various parameters, leading to precipitate heart attack. The data were collected for 6 months from January to June 2021. The patients who were attending to the cardiovascular and general medicine departments with potential risk factors were included in to the study to assess MI risk using Easy CVD (EZ-CVD) risk assessment tool and followed by counseling to avoid further complications and to minimize mortality rate and improve health-related quality of life among the patients.

Risk assessment tool

EZ-CVD risk assessment tool possess six questions (which include age, gender, history of diabetes, high blood pressure, smoking, and family history of heart attack at age 60 or younger) and evaluates the risk through self-reported scoring method. The risk is assessed based on the score points. If the score is six or more points, the patients are considered to have higher risk for future cardiovascular disease and should receive appropriate preventative therapy.

Data collection

Before conducting the study, the written informed consent was taken and the total study procedure was explained to the patients. Only the patients, agreed to give consent, were included in the study by taking their relevant information like demographic details, heart surgeries, mental status, obese, alcoholic, smoking, cardiac disease, and other activities which were collected in the patient data collection form by personal interview.

The enrolled patients were applied with EZ-CVD risk assessment tool that possesses six questions (which include age, gender, history of diabetes, high blood pressure, smoking, and family history of heart attack at age 60 or younger) to evaluate their risk through self-reported scoring

method. The risk is assessed based on the score points. If the score is six or more points, the patients are considered to have higher risk for future cardiovascular disease and should receive appropriate preventative therapy. The pharmacists have mediated patient counseling sessions, during which, every patient or their representatives were counseled individually. Investigators had given counseling regarding the patient's health conditions, disease, diet, and exercise. Further, follow-ups and counseling were done at cardiology outpatient department during their visit for further review and follow-up.

RESULTS

The study was conducted for 6 months duration in the cardiology and general medicine department. During the study period, 60 patients' eligible patients were enrolled. Among them, 36 (60%) were male and 24 (40%) were female. The demographic details of the patients are presented in the Fig. 1.

All the enrolled patients were segregated as per age. Majority patients were belonging to 50–70 years of age (36). Details of the patients age distribution are presented in following Fig. 2.

Out of 60 patients, 29 (48.3%) were found with both diabetes and hypertension, 18 (30%) patients were diabetic, and 6 (10%) patients were without any comorbidities. Fifteen (25%) patients were with family history of heart attack at the age of 60 years or younger, 13 (21.6%) patients were current smokers, 10(16.6%) patients are former smokers, and 37 (61.6%) patients were never smoked. The details of risk factors are presented in Table 1.

The MI risk scores are calculated and presented in Table 2. Out of 60 patients, 37 (61.6%) were at low risk (0–5) of MI and 23 (38.3%) were at high risk (six and above) of MI.

DISCUSSION

Based on the evidences available among global studies, the potential risk factors are likely to cause MI among the individuals in the productive age group. The main results of this study are based on EZ-CVD risk assessment tool to estimate 10-year risk of having MI. MI is a myocardial cell death due to prolonged ischemia, which occur over a period of time if potential risk causes are neglected.

The most common cause of MI is atherosclerosis which develop over a period of time, that is, more than 5–6 years with possible risk factors. Many patients are unaware about their clinical condition and consulting a doctor for further treatment. This will lead to the sudden attack and possible death, especially among the individuals in the productive age group, will be a huge loss to the family and to the society. Hence, precautions should be taken to prevent further complications to minimize mortality and to improvise the patient's health-related quality of life [11].

Studies have shown that age is one of the prominent risk factors in developing MI and other risk factors are gender, smoking, hypertension, hyperlipidemia, obesity, alcohol consumption, family history of heart attack, sedentary life style, stress factor, etc. A systematic review of prospective and retrospective studies suggests that age, gender, overweight, obesity, hypertension, smoking, sedentary life style, CKD, psychological stress factor, hyperlipidemia, and alcohol consumption are likely to contribute 60–70% individuals having MI risk and mortality [5-7].

The average age of the study patients is 40–70 years. During the study period, out of 60 patients, 23 patients were found higher risk of future MI. In our study, the findings show that men are at higher risk of MI than women due to higher levels of risk factors including abnormal lipids and smoking, alcohol consumption before the age of 60.

There are several MI risk assessments tools to assess the future risk of MI among the individuals. Among them, Cochrane bias risk tool,
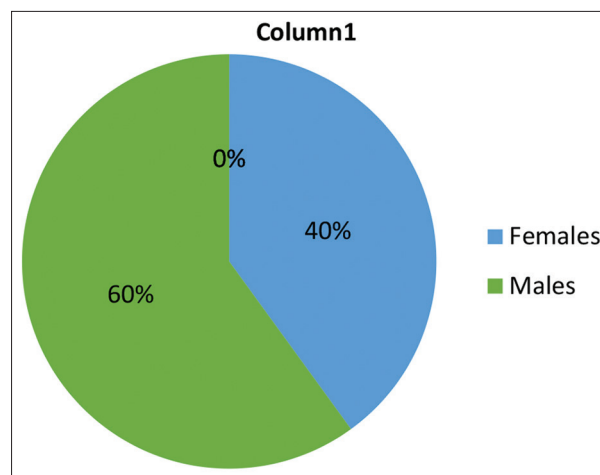

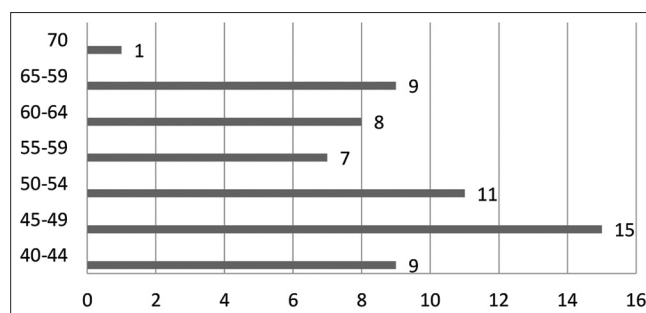**Fig. 1: Demographic details of the enrolled patients**

Fig. 2: Details of age distribution of the study patients

Table 1: Risk factors identified among the study subjects

Risk factor	Number of patients (%)
Diabetes with hypertension	29 (48.3)
Only diabetes	7 (11.6)
Only hypertension	18 (30)
Without hypertension and diabetes	6 (10)
Family history	15 (25)
Current smoker	13 (21.6)
Former smoker	10 (16.6)
Never smoked	37 (61.6)

Table 2: MI risk scores among the enrolled patients

Risk score	Number of patients (%)
0–5	37 (61.6)
6	6 (10)
7	5 (8.3)
8	3 (5)
9	8 (13.3)
10	1 (1.6)

Thrombolysis in MI risk score (TIMI), and Escalade Stratification were few among them proven to give more qualitative results. Cochrane risk tool is used to assess the risk bias of randomized control trial, risk bias is assessed by high risk, low risk, and uncleared risk. TIMI risk is assessed by low risk (0–4), moderate risk (5–8), and high risk (9–14). Novel simple risk score is an easy tool to predict CVD events in adults through self-report information without need of laboratory and self-report examination data. EZ-CVD risk assessment tool assesses the risk by 10-year history of risk factors by collecting patient's self-report information. Risk score is calculated based on risk score criteria; EZ-CVD risk score includes six self-reported factors.

In a study conducted by American heart association reported that approximately 1/4th of MI occurred at the age of 55 years or above. The present study concluded that diabetes and hypertension are the major risk factors for MI. In this study, about 29 (48.3%) people were diabetic with hypertension, 7 (11.6%) people were diabetic, and 18 (30%) people with hypertension. A study by conducted by Hendriks *et al.* concluded that hypertension was associated with risk of future MI. Various studies have also shown that diabetes was associated with high risk of MI [12].

Along with diabetes and hypertension, family history and smoking are also associated with high risk of MI. In the present study, it was noted that family history of MI is present in 15 (25%) patients and history of current smoking was 10 (16.6%) patients. The WHO reported that among women, adherence to life style modification, body weight, diet, exercise, alcohol consumption, and abstinence from smoking are associated with an 80% lower risk of MI [13].

In another study, overweight and obesity are associated with high risk of MI and it is necessary to maintain healthy BMI to prevent acute MI. Studies have also suggested that increased physical activity in the 1st year of post MI is associated with low risk of MI death [14]. Studies have observed the impact of lipids within 24 h of MI. Most of the patients had high levels of LDL and low levels of HDL. The statin treatment in such cases has shown significant reduction in the LDL levels and atherosclerosis [15].

CONCLUSION

EZ-CVD risk assessment tool is used to predict risk of future MI in adults without any laboratory or physical examination data but only using self-report information. This risk assessment tool can be easily applied by physicians as a primary care to assess the risk of future MI for the prevention of further complications and mortality. The study concludes that using EZ-CVD risk assessment tool 23 (38.3%) patients were found having high risk for future occurrence of MI among the total of 60 study patients.

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CONFLICTS OF INTEREST

None.

SOURCE OF FUNDING

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