ORIGINAL ARTICLE

ASSOCIATED RISK FACTORS OF ACUTE MYOCARDIAL INFARCTION AMONG HUNAN POPULATION IN CHINA

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ABSTRACT

The purpose of this study to determine the clinical characteristic of the associated risk factors of acute myocardial infarction patients (AMI) among the Hunan Han population in China. The retrospectively collected the records data of 595 both STEMI and NSTEMI patients from the first Xiangya hospital, Hunan, China over a period of January 2018 and December 2018. These studies revealed clinical characteristics with associated risk factors among acute myocardial infarction patients. A total of 595 diagnosed acute myocardial infarction patients participated in this study among males 70.9% and females 29% with mean age e 52.9+11.3 years. While 90% had STEMI and 9.9 % had NSTEMI. The chest pain 94.4%, 86% and shortness of breath 55%, 100% presented with STEMI and NSTEMI groups respectively. Smoking incidence in male subject 70.3% had higher than in female subject 29.1 % (P<0.05). Hypertension and diabetes mellitus found 59%, 69.5% in male participants as compared to 40.6%, 30.4% in female participants respectively (P<0.05). However, no statistical difference was found among dyslipidemia males 48.6% and females 47.4%. The most common type of AMI was STEMI and usually presented with chest pain and shortness of breath. The AMI patients were more found in male and common associated risk factors were smoking and hypertension followed by diabetes mellitus and dyslipidemia.

Keywords: *Acute myocardial infarction, ST elevation myocardial infarction, Chest pain, Smoking, Hypertension.*

INTRODUCTION

In recent years cardiovascular disease dramatically increasing in developing countries.[1] According to data from 2010 in china, approximately 8 million of the Chinese population who had been suffering a myocardial infarction (MI) over the age of 40 years and more than 1 million deaths occur per year.[2,3] Therefore, the World Health Organization declares that the number of MI will be increased by roughly 23 million by the 2030 years. Although another study reported in china around 290 million had CAD along with 11 million ischemic heart diseases in the year of 2015 (IHD).[4]

Many study review in the developed countries such as Canada, Europe, and the USA that myocardial infarction may depend on gender and age variation which was comparatively increased the female mortality rate than males. [5,6] However, published information from China Patient-centered Evaluative Assessment of Cardiac Events (China PEACE)- this Retrospective focus on acute myocardial infarction patients and as well as ST-Segment Elevation Myocardial Infarction (STEMI), the result shown gradually increasing both genders of STEMI patients admissions in hospital since the last decade. While females 30% was affected among total admission patients.[7] Thus, it has been clearly documented that AMI may exist gender dependable and need proper arrangement which supports to improve the care of AMI patients. Conversely, since the last few decades, myocardial infarction plays a leading cause of the high mortality rate in china, which was considered a burden for the Chinese population.[7]

The myocardial infarction (MI) patients frequently complain about chest pain even in resting position. The electrocardiographic (ECG) changes are important to know the status of AMI that will help for proper management. However, the major risk factor for AMI as hypertension, diabetes mellitus, dyslipidemia, and as well as smoking. Previously reported that hypertension and diabetes have acted as a risk for developing myocardial infarction.[8] Besides, another study recognized that diet, smoking, obesity behind the responsible for AMI.[9] While in India the cigarette smoking is the highest causes of MI.[10] Several study evidence of review of 2171 MI patients and discovered the individual smoking has capacity to produce MI and it was affected 37% among the total of the population in South Asia.[11] On the other hand, some study focuses on common risk factors such as diabetes and hypertension, which are responsible for increasing the risk of MI. Therefore present study aimed to evaluate the commonly associated risk factor among MI in Chinese patients in Hunan China, which will help to prevent and proper management of MI,

and may reduce the mortality and morbidity rate in China.

METHODS

This retrospective study was designed with a diagnosed of acute myocardial infarction subject who was conducted at the cardiac department of the First Xiangya Hospital, Central South University, Hunan, China, from January 2018 and December 2018. A total of five hundred ninety-five myocardial infarction patients participated in this study. **The** Hospital recorded data such as age, gender, smoking, hypertension, diabetes mellitus, dyslipidemia, and clinical patterns of STEMI and NSTEMI were collected from all the study subjects. The review of laboratory data including high-density lipoprotein (HDL), low-density lipoprotein (LDL), total cholesterol (TC), blood sugar level along with echocardiography (ECG) reports were also included. The ethical clearance approved by the Ethics Committee of Central South University.

Statistical analysis

The chi-square test was used for differences in risk factors of both males and females for categorical variables. All available data were analyzed by using SPSS 20.00 software with considering at significant at (p-value of <0.05).

RESULTS

A total number of 595 diagnosed AMI patients among 422 (70.9%) males and 173 (29) %) females have participated in this study. The mean age of all patients was 52.9+11.3 years. The demographic characteristic of patients was represented in table-1.

Table 1. Demographic and clinical characteristics

Factors	Total number of patients(n=595)%
Mean age	52.9+11.3 years
Male	422 (70.9)
Female	173 (29)
Total cholesterol	4.2±0.9 mmol/L
LDL	2.2±0.8 mmol/L
HDL	1.3±0.3 mmol/L
Fasting Blood Sugar	6.9±3.7 mmol/L

The greater part of AMI patients (90%) shown elevation of ST-segment (STEMI), while only (9.9) had non-ST elevation MI (NSTEMI). The acute myocardial infarction more presents 51.3% in the anterior wall and 41.9% in the inferior wall. While 1.6 %, 2.7%, and 2.23% occur in anterior inferior, anterior lateral and inferior lateral wall respectively were shown in Table-2.

Table 2. ECG findings among all participants in this study.

ECG findings	Number %
ST-segment elevation MI	536 (90)
Non- ST segment elevation MI	59 (9.9)
Pathological Q wave	35 (6.5)
Site of infraction (N= 536)	
Anterior wall	275 (51.3)
Inferior wall	225(41.9)
Anterior + inferior wall	9 (1.6)
Anterior + lateral wall	15(2.7)
Inferior + lateral wall	12(2.23)

The clinical presentations were chest pain (96.4) %, shortness of breathing (55%), palpitation (15.8) %, dizziness 5%, syncope (2.4) %, sweating (4.2)%, nausea(3.1)% and vomiting (2.6)% in STEMI patients. While common clinical symptoms shortness of breath (100)% present in NSTEMI followed by chest pain (86)%, palpitation (11.9)% dizziness (15.2)%, syncope (6.8)%, sweating (11.8)% ,nausea (5)% , and vomiting (3.3)% which were more details in Table-3.

Table 3. Clinical characteristics of STEMI and NSTEMI patients.

Clinical characteristics	STEMI (N=536)%	NSTEMI (N=59) %	P-value
Shortness of breath	295 (55)	59 (100)	P <0.05
Chest pain	517(96.4)	51(86)	P <0.05
Palpitation	85 (15.8)	7(11.9)	-
Dizziness	27 (5)	9 (15.2)	P <0.05
Syncope	13 (2.4)	4(6.8)	-
Sweating	23(4.2)	7 (11.8)	P <0.05
Nausea	17 (3.1)	3 (5)	-
Vomiting	14 (2.6)	2 (3.3)	-

The comparison of risk factors between males and females and found the most common risk factors as hypertension (59) % in males and 40.6% in female, while DM (69.5)% in males and (30.4)% in female at considering significant p<0.05. In addition, results showed smoking (70.8) % in males and (29.1) % in females which was significant (Table-4). However,

dyslipidemia present (48.6) % in males and (47.4) % in females but statistically were not significant.

DISCUSSION

There was no previous study regarding the Chinese population with clinical characteristics and risk factors associated with acute myocardial infarction in Hunan province China. In the present study found total 595 patients suffering acute myocardial infarction among 536(90%) patients shown ST-segment elevation acute myocardial infarction (STEMI) and 59(9.9%) non-ST segment elevation acute myocardial infarction (NSTEMI) which was revealed by a review of ECG. Besides, there was reported that in china most non-communicable disease consider as STEMI and subsequently needed to improve the protocol for the management.[12] While this study also emphasis to arrange adequate hospital capacity and as well as train up the professionalism in their specialized field which leads to improving the patients caring.

Table 4. Clinical characteristics with risk factors among male and female patients.

Variables	Over all%	Male (n=422)%	Female(n-=173)%	P value
Hypertension	401 (67.3)	238(59)	163(40.6)	P <0.05
Smoking	419 (70.4)	297 (70.3)	122 (29.1)	P <0.05
DM	345 (57.9)	240 (69.5)	105 (30.4)	P <0.05
Dyslipidemia	367 (61.6)	193 (48.6)	173 (47.4)	-

In the present study, analysis of the clinical presentation of all the participants of STEMI and NSTEMI which were found chest pain 96.4% higher in STEMI than 86% in NSTEMI, while the shortness of breath 100% present in all NSTEMI patients than 55% in STEMI. On the other hand, sweating 4.2%, nausea 5% and vomiting 3.3% present in NSTEMI patients versus to 4.2%, 3.1% and 2.6% shown in STEMI patients which were higher in NSTEMI. Although, the symptoms of palpitation 15.8%,11.9% and syncope 2.4%,6.8% found in STEMI and NSTEMI patients respectively. Smoking is the most common risk factor for AMI in this study, overall found 70.4 % which compared between males and females and shown significantly higher 70.3% in males than 29.1% in females.

It has been evidenced that smoking is a serious health issue and responsible for the development of AMI in the turkey population and as well as globally.[13] Another study, reported smoking is the most common risk factor among younger AMI patients.[14, 15] It has been reported that smoking may increase risk of AMI incidence as compared with non-smoking subjects.[11] In addition, smoking perhaps thrombus formation due to impaired the homeostasis pathway to higher the oxidative stress that may mechanism of smoking cause cardiovascular diseases.[16] Thus above this statement revealed that cessation of smoking may prevention of AMI. The current study found, the presence of hypertension increased in risk male AMI 59% compared to female 49.6 %. Although, previously documented that hypertension 35% found in male which was lower and 53 % in female, which were higher than present results.[16] However, present results indicated hypertension was an individual risk for STEMI patients, similarly reported by another study.[17] Besides, diabetes mellitus found (69.5) % in males compared to females 30.4% and highly significant. However, DM along was a common risk factor for males in our study , DM may leading cause of worse the AMI.[18] Recently, DM is the most common health issue in the Asian population.

The DM and AMI has strong co-relation had been noticed in Europe and USA beside of Asian.[19] In the present study shown dyslipidemia 48.6% in male and 47.4 % in the female that was similar to another study. [20] The high LDL and Low HDL has established as a risk factor for atherosclerosis and as well as cardiovascular diseases, while the present finding shown the mean LDL and HDL was 2.2±0.8 mmol/L and 1.3±0.3 mmol/L in all participants. Besides, in the present study, the anterior wall (51.3) % and the inferior wall (41.9) % was the most common side of infraction that similar to another study. [21] Nevertheless, it was well recognized that the infraction in anterior wall considers as a worse prognosis than inferior wall infarction. However, the present study evaluated the associated risk factors among the Chinese population in Hunan province, China.

CONCLUSION

This retrospective study found STEMI was the most common type of AMI. In addition, chest pain and shortness of breath was the most common clinical feature in both STEMI and NSTEMI groups. In the present study noted most of the AMI patients were males than females with correlated risk factors of smoking, hypertension, diabetes mellitus and dyslipidemia. Therefore, the current study suggested about early diagnosis and prevention of the major risk factors may reduce the rate of AMI.

Limitation

In the present study have some limitation like a single study center, small sample size, and missing some data in some patients. However, need to further study with larger sample size in multihospital.

CONFLICT OF INTEREST

None

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