Epidemiology, risk factors, and in-hospital outcome of acute coronary syndrome (ACS) patients younger than 40 years in Kermanshah, 2010-11

Mostafa Bahremand (1)
Parisa Janjani (1,2)
Nahid Salehi (1)

(1) Department of Cardiology, School of Medicine, Kermanshah University of Medical Sciences, Kermanshah, Iran
(2) PhD Student of Psychology, Faculty of social sciences, Razi university, Kermanshah, Iran

Corresponding author:
Nahid Salehi
Department of Cardiology, School of Medicine,
Kermanshah University of Medical Sciences,
Kermanshah, Iran
Email: n_salehi45@yahoo.com

Abstract

Background: CAD is the most important public health issue in developing and developed countries. Therefore, this study was done with the objective of determining epidemiology, risk factors, and in-hospital outcome of acute coronary syndrome (ACS) patients younger than 40 years, admitted to the hospital of Kermanshah, Iran in 2010-11.

Methods: In this cross-sectional study, CAD risk factors and in-hospital outcome of ACS patients who were younger than 40 years at the time of admission were extracted from their medical records. A total number of 2,084 medical records were reviewed, of which 125 records met the criteria and were included. The required information were gathered and inserted into the ACS registry developed by the European Society of Cardiology. The data were analyzed by the SPSS software (ver. 20.0) using descriptive indices and the Chi-squared test.

Results: Of 125 patients, there were 98 male and 27 females with age range of 19 to 40 years (mean age of 36.67 ±5.19 years). About 44.8% had unstable angina, 14.4 had Q-wave myocardial infarction (MI) and 27.2% had non Q-wave MI. All patients were alive at the time of the study and only one patient (0.8%) had history of MI.

Conclusion: Unstable angina in individuals younger than 40 years is becoming common and is three times more common in males than in females.

Key words: Risk factors, acute coronary syndrome, in-hospital outcome, Kermanshah

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Introduction

Coronary artery disease (CAD) is the most important public health issue in both developing and developed countries.(1) A major number of patients admitted to the hospitals run by the Iranian Ministry of Health and Medical Education are those with heart diseases, especially acute coronary syndrome (ACS).(2) According to the studies, high social costs and death risk related to cardiovascular diseases are more than any other medical condition. Nowadays, considering the better longevity and change in the lifestyle of the populations, cardiovascular diseases are becoming more common.(3) In the US, up to age 60 years, one male of every three males develops CAD. This rate is 1:10 in females.(1) In Iran, cardiovascular diseases are the most common cause of death and 46% of deaths are attributed to this factor. ACS includes ST-segment elevation myocardial infarction (STEMI), MI without ST elevation (NSTEMI), and unstable angina.(4) ACS encompasses a wide group of heterogeneous diseases ranging from diseases with nonspecific electrocardiogram (ECG) changes and normal cardiac serum biomarkers to STMI and cardiogenic shock. The most important clinical symptoms of ACS are substernal chest pain or epigastric pain which radiates to the neck, shoulders, and left arm. ACS patients may experience some non-specific symptoms for weeks or months before the cardiac event. These include fatigue, dyspnoea, gastrointestinal symptoms, anxiety, and chest discomfort.(5) Traditionally, ACS symptoms are regarded similar in both genders, but studies advocate that there may be relationship between ACS symptoms and gender. Milner et al. (2002) reported that females are more likely than males to experience symptoms other than chest pain like nausea, vomiting, abdominal pain, dyspnoea, and back, jaw or neck pain. Also, some studies report that males are more likely to experience chest pain and diaphoresis than females do.(6) CAD usually occurs in those older than 40 years, however this can occur in younger patients as well.(7) About 10-30% of ACS cases are reported in young patients who are less than 45 years. It is presumed that ACS in young patients presents as the consequence of a thrombotic event and is not related to basic atherosclerotic disease.(8) Generally, accurate assessment of ACS symptoms to initiate intervention is important in three fields. First, the occurrence of symptoms is an important factor which causes the patient to seek medical care. Second, assessment of symptoms is important in correct triage of patients which is usually done by nurses. Third, correct recognition of ACS symptoms is an effective factor in continuing assessment of patients and immediate intervention. The knowledge as to how patients may present with ACS symptoms can both accelerate the diagnosis of ACS and decrease mortality and improve their quality of life.(9) Prompt presentation to hospital is an important factor to achieve better outcome in ACS patients, but only less than 10% of patients present to hospitals in the first 1 hour of symptom onset which is the best time to achieve the desired outcome.(10) Young adults with CAD are an important group to consider with regard to justification of risk factors and secondary prevention as this age group comprises an active group in the population.(7)

There is no explicit report in Iran about the frequency distribution of ACS such as MI, unstable angina, and in-hospital outcomes in patients younger than 40 years. Therefore, this study was done to determine the epidemiology, CAD risk factors, and in-hospital outcome of patients younger than 40 years who presented to Kermanshah hospitals, Iran in 2010-11.

Method

Study population

In this cross-sectional study, the study population consisted of all patients with ACS who presented to the hospitals of Kermanshah, Iran which had cardiology emergency services in 2010-11. A total number of 2,084 records were reviewed, of which 125 records met the desired criteria. The records with incomplete information were not included.

Research Tool

The ACS registry developed by the European Society of Cardiology was used to insert the required data. The variables included the information upon presentation of the patient to the hospital, during hospitalization, and discharge.

Study Design

The medical records of patients who were diagnosed with ACS and who were younger than 40 years were reviewed. The information gathered was age, gender, marital status, educational level, occupation, hypertension, diabetes mellitus, dyslipidemia, body mass index (BMI), and in-hospital outcomes.

Statistical analyses

The data were analyzed by the SPSS software (ver. 20.0) using descriptive indices and the Chi-square test.

Results

Table 1 presents the demographics of the studied population. As shown, there were 98 males (78.4%) and 27 females (21.6%). Most patients were aged 35 to 40 years and age range of 39-40 was the most common age range group (42 patients, 34%). Age ranges of 37-38 years (28 patients, 22.4%) and 35-36 years (19 patients, 15.2%) were respectively the second and third most common age groups. The lowest numbers of patients were reported in age ranges of 19-20 years and 21-22 years (less than 3%). The most common weight range group was 71-80 Kg (57 cases, 45.6%) and then 81-90 Kg (24 cases, 19.2%). The weight group of more than 120 Kg and less than 50 Kg (less than 2%) were the least frequent weight groups.

According to Table 2, most patients did not have history of MI (125 cases, 99.2%) and only one patient had history of MI (one patient, 0.8%). Most patients (110 cases, 88%) did not have diabetes mellitus. Among patients with diabetes, the most frequent patient group was belonging to those who were “medicine takers” (13 cases, 10.4%). About one-fourth of patients (24 cases, 19.2%) had hypertension and most patients (99 cases, 79.2%) were normotensive subjects.

Table 1: Demographic characteristics of the study population

		Frequency	Percent	Cumulative Percent
Sex	Male	98	78.4	78.4
	Female	27	21.6	100
	Total	125	100	----
Age	39-40	42	33.6	33.6
	37-38	28	22.4	56
	35-36	19	15.2	71.2
	33-34	8	6.4	77.6
	31-32	9	7.2	84.8
	29-30	4	3.2	88
	27-28	3	2.4	90.4
	25-26	4	3.2	93.6
	23-24	3	2.4	96
	21-22	2	1.6	97.6
	19-20	3	2.4	100.0
	Total	125	100.0	----
Weight	41-50	2	1.6	1.6
	51-60	4	3.2	4.8
	61-70	22	17.6	22.4
	71-80	57	45.6	68
	81-90	24	19.2	87.2
	91-100	3	2.4	89.6
	101-110	8	6.4	96
	111-120	3	2.4	984
	121-130	2	1.6	100.0
	Total	125	100.0	----

Table 2: Baseline characteristics of the patients

		Frequency	Percent	Cumulative Percent
Stroke	No	124	99.2	99.2
	Yes	1	0.8	100.0
	Total	125	100.0	----
Diabetes	Non-diabetic	110	88	88
	Diabetic (oral medication)	13	10.4	98.4
	Newly diagnosed	1	0.8	99.2
	Unknown	1	0.8	100.0
	Total	125	100.0	----
Hypertension	No	99	79.2	79.2
	Yes	24	19.2	98.4
	Unknown	2	1.6	100.0
	Total	125	100.0	----

About 50.4% of patients (63 cases) were non-smokers (Table 3). But 60 patients (48%) were current smokers and 2 cases (1.6%) were former smokers. Most patients (114 cases, 91.2%) did not have MI and only 11 cases (8.8%) had MI. Regarding the most prominent symptom reported by the patients, the most frequent symptoms was chest pain (114 cases, 94.4%). Regarding systolic blood pressure (BP), most patients had systolic BP measurements between 95 and 155 mmHg (88% of the cases). About 43.2% of the patients (54 cases) had systolic BP range of 116-135 mmHg, 34 cases (27.2%) had range of 96-115 mmHg, and 16% (20 cases) had range of 136-155 mmHg. Regarding psychological variables (depression and anxiety), most patients (106 cases, 84.48%) did not report symptoms of anxiety or depression. About 15.2% of cases (19 patients) had mild anxiety and depression. Regarding the primary diagnosis, 56 cases (44.8%) had unstable angina, 51 cases (40.8%) had NSTEMI, and 18 cases (14.4%) had STEMI or left bundle branch block (LBBB) MI.

Table3: Prevalence of coronary artery disease risk factors

Status		Frequency	Percent	Cumulative Percent
Smoking	Never	63	50.4	50.4
	Current	60	48	98.4
	Former	2	1.6	100.0
	Total	125	100.0	----
HPMI	No	114	91.2	91.2
	Yes	11	8.8	100.0
	Total	125	100.0	----
PPS	Chest pain	118	94.4	94.4
	Dyspnoea	2	1.6	96
	Syncope	1	0.8	96.8
	Other Symptoms	4	3.2	100.0
	Total	125	100.0	----
Systolic	75-95	6	4.8	4.8
	96-115	34	27.2	32
	116-135	54	43.2	75.2
	136-155	20	16	91.2
	156-175	5	4	95.2
	176-195	4	3.2	98.4
	196-215	1	0.8	99.2
	216-235	1	0.8	100.0
	Total	125	100.0	----
Anxiety/ depression	1 - I am not anxious or depressed	106	84.8	84.8
	2 - I am moderately anxious or depressed	19	15.2	100
	Total	125	100.0	----
Working diagnosis	STEMI/LBBB MI	18	14.4	14.4
	NSTEMI	51	40.8	55.2
	Unstable Angina	56	44.8	100.0
	Total	125	100.0	----

HPMI- History of prior myocardial infarction; PPS-Predominant Presenting Symptom

As seen in Table 4, all patients were alive at the time of the study. None of the patients experienced cardiac arrest which required resuscitation during the hospitalization. Most patients (123 cases, 98.4%) did not have coronary bypass surgery (CABG) and only 2 patients (1.6%) received emergency CABG. Most patients (99.2%, 124 cases) did not develop MI during hospitalization. Only one patient (less than 1%) developed hemorrhage during hospitalization. Regarding the final diagnosis made upon discharge, 69 patients (55.2%) had unstable angina, 34 cases (27.2%) had non-Q wave MI, and 18 cases (14.4%) had Q wave MI. Most patients did not develop stroke (124 cases, 99.2%).

Table 4: In-hospital outcome of patients with acute coronary syndrome

Status		Frequency	Percent	Cumulative Percent
Survival status	Alive	125	100.0	100.0
	dead	0.0	0.0	100.0
	Total	125	100.0	----
Resuscitated cardiac arrest	No	125	100.0	100.0
	Yes	0.0	0.0	100.0
	Total	2084	100.0	----
CABG	No	123	98.4	98.4
	Emergency	2	1.6	100.0
	Total	125	100.0	----
MRIH	No	124	99.2	99.2
	Yes	0.0	0.0	99.2
	Unknown	1	0.8	100.0
	Total	125	100.0	----
Bleeding in hospital	No	124	99.1	99.1
	Unknown	1	.9	100.0
	Total	125	99.2	----
Discharge diagnosis	Q wave MI	18	14.4	14.4
	Non Q wave MI	34	27.2	41.6
	Unstable Angina	69	55.2	97.8
	Other	3	2.4	100.0
	Total	125	100.0	----
Stroke in Hospital	Valid No	124	99.2	100.0
	Valid System	1	0.8	----
	Missing			
	Total	125	100.0	----

CABG- Coronary Artery Bypass Graft ; MRIH-Myocardial Reinfarction in Hospital

Discussion

This study was conducted to determine the epidemiology, CAD risk factors, and in-hospital outcome of patients younger than 40 years who presented to Kermanshah hospitals, Iran in 2010-11. Most reported studies in this field have been done in those older than 40 years. The results showed that 78.4% were male and 21.6% were female. Most patients (34%) were aged 39-40 years (34%) and the least frequent age groups were 19-20 and 20-21 years (less than 3%). Regarding weight, the most frequent group was 71-80 Kg (45.6%) and the least frequent group was less than 50 kg (less than 2%). Most patients did not have history of MI, and only one patient (0.8%) stated the history of MI. Also, 88% of patients did not have diabetes which is not compatible with the results reported by Andrikopouloset al. which reported that 27% of patients older than 40 years did not have diabetes (2012). But in the Khalid et al. study (2011), 58.1% of patients older than 40 years were diabetics.(11, 12) About 19.2% of patients had hypertension, but the results of two other studies.(11, 12) reported a higher number of patients with hypertension (67.9% and 55.3%). In this study, 48% were current smokers and 1.6% were former smokers. In a study by Faizal et al. (2009), 39.13% were current smokers and in the study of Khalid et al. (2011), 32.8% were current smokers(12,13). They reported that the prevalence of smoking is more prevalent in those younger than 40 years than in those older than 40 years. About 44.8% of the patients had unstable angina, 14.4% had Q-wave MI, 27.2% had non-Q wave MI, 40.8% had NSTEMI, and 14.4% had STEMI/LBBB MI. Non-Q wave MI was twice more common than Q wave MI. In a former study by Moludi et al. which was performed among those older than 40 years, non-Q wave MI was twice more common than Q wave MI.(1) We observe a trend in increase in the rate of non-Q wave MI and decrease in the rate of Q wave MI in all ages. All patients survived. Also, none of the patients experienced cardiac arrest. Most patients (98.4%) did not required CABG, and only in 2 patients this procedure was required. Only one patient experienced hemorrhage during hospitalization and most patients (124 cases, 99.1%) did not develop hemorrhage.

Conclusion

Unfortunately the prevalence of CAD is growing in our community which is important from the standpoint of epidemiology. Also, we observe a growing trend of CAD in patients younger than 40 years which seems that hereditary factors, lifestyle, and psychological stress have major roles in this regard. It could be concluded that ACS is growing in patients younger than 40 years which requires more studies to determine its etiology.

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