Acute Myocardial Infarction in the Young

M. H. Soltani, MD; M. Sadr, MD; M. Rafee, MD; M. Imami, MD; M. Motafakker, MD; A. Andishmand, MD and M. Nemayandeh, MD.

Abstract

Background- The purpose of this study was to assess frequency, risk factors, complications and mortality rate of young patients with acute myocardial infarction (AMI), in Yazd.

Methods- From a database of 815 consecutive patients admitted to Yazd hospitals with AMI between 2001 and 2002, we compared care, risk factors, complications and outcome of patients, divided into two age groups: ≤ 45 years, (young) and >45 years (old). Risk factors, type of AMI, management, complications and hospital outcomes of the 2 groups were evaluated.

Results- The young patients represented 11.6% of all cases, and 10% of these individuals were female. Smoking (60.2% vs. 33.6%, P. value=0.000), positive family history (40.2% vs. 28.6%, P. value=0.017) and obesity (25% vs. 13.9% P. value=0.022) were more common in the young group. Diabetes mellitus (24.1% vs. 46.9%, P. value=0.000) and hypertension (15.1% vs. 43.3%, P. value=0.000) were more common in the old patients. Young male patients had less in-hospital mortality (1.2% vs. 9.1%, P. value=0.005) than old male patients, but in the females the difference of mortality between young and old was not significant (10% vs. 19.9%, P. value=0.3).

Conclusion- In this study, about one-tenth of the patients with AMI were ≤ 45 years old. Smoking, obesity and positive family history were more common in the young patients, and overall mortality rate was low in the young *(Iranian Heart Journal 2005; 6 (1,2): 52-54).*

Key words: **Yazd ■acute myocardial infarction ■ young**

Acute myocardial infarction (AMI) is a common cause of disability and death, and when it happens in young individuals, it causes more social and economic disadvantages. About 10% of all patients with AMI are <45 years old [1, 2]. Their risk factors vary in different countries. In most studies, smoking is the most prevalent risk factor in young patients[1-2-3-4-5-6] Positive family history of coronary artery disease (CAD) has been important in some studies.[3,6,7] Hypertension and diabetes mellitus are more common in older patients in most studies.[2,4,6]

In some studies, hypertriglyceridemia[5], high LDL.C[3] and high fibrinogen[3] are independent significant coronary risk factors in young patients. To assess these issues in our patients, this study was done in Yazd.

Methods

815 patients with AMI, admitted to all coronary care units of Yazd between 2001 and 2002, were studied. The diagnosis of AMI was confirmed with standard ECG criteria and at least three fold increment in consecutive CPK levels.

We compared risk factors, care, in hospital complications and mortality rate in patients ≤45 years (young group) and >45 years (old group).

Risk factors were defined as follows:*Hypertension:* History of hypertension (BP ≥ 140 / 90 at least two split measurement) or drug use for hypertension.

Diabetes mellitus: History of diabetes mellitus or drug use for diabetes, or at least one BS≥200 mg/dl via random venous sampling.

Cigarette smoking: Ten cigarettes per day for at least one year.

Hypertriglyceridemia: Fasting triglyceride more than 200 mg/dl.

Hypercholesterolemia: Fasting LDL-C more than 130 mg/dl.

Low HDL: HDL-C lower than 35 mg/dl.

Positive family history: Sudden death or AMI in young first degree relatives (men ≤ 55, women ≤ 65 years old).

Obesity: BMI more than 30.

Data analysis was performed with the chi square, Fisher's exact test and T test using SPSS software.

Results

815 patients with AMI were enrolled in this study. Ninety-five patients (11.6%) were ≤ 45 years old (90% male, 10% female). 720 patients (88.4%) were >45 years old (77% male, 23% female).

The frequency of risk factors is shown in Table I.

Smoking, positive family history and obesity were more prevalent in the young patients, and hypertension and diabetes mellitus were more prevalent in the old patients.

Hypercholesterolemia and hypertriglyceridemia were more common in the young group, but the difference was not significant.

Thrombolytic drug (streptokinase) was used in 67.7% of the young vs. 54% of the older patients (p value=.008).

Mean levels of cholesterol, LDL. C, HDL. C and triglyceride were 197±71 vs. 191±50, (p value=0.158); 128±36 vs. 118±43, (p value=0.62); 41±11 vs. 39±10, (p value=0.72); and 176±118 vs. 164±118, (p value=0.136) in the young and old patients, respectively.

The frequency of major in-hospital complications is shown in Table II.

The in-hospital mortality rate was 2/2% in the young vs. 14/7% in the older patients. It was 1/.2% in the young males vs. 9.1% in the young females (P. value=0.005) and 10% in the old males vs. 19.9% in the old females (P. value=0.385).

The mortality rate in the young male patients was very low, but in the young females and old patients it was relatively high.

Discussion

Acute myocardial infarction (AMI) is a common cause of disability and death in many countries[8] and causes more disadvantages, when it happens in young patients. Therefore, the diagnosis of major risk factors and their modification may prevent AMI in young individuals.

In this research, 11.6% of all the patients with AMI were ≤ 45 years old. In the Doughty M study in USA [1] and Morillas PJ in Spain[2], the frequency of young patients (≤45 years old) with AMI was 10% and 6.8%, respectively. It appears that more patients in our study were young. Smoking, obesity and positive family history were major risk factors in our patients.

In the Doughty M study in USA,[1] Morillas PJ in Spain,[2] Von Eyben FW in Denmark[3] Miyamoto S in Japan,[4] Ranjith N in South

Africa[5] and Zimmerman FH in USA[6] cigarette smoking is a common risk factor in young patients with AMI.

Positive family history was an important risk factor in our young patients as it was in the Von Eyben FE[3], Zimmerman FW[6] and Friedlander Y[7] studies.

Obesity was also more common in our young patients as it was in the Miyamoto S study.[4]

Table I. risk factor frequency in two age groups

Risk factors	Frequency of risk factor (%)		P. value
	Young(28-45)	Old(46-100)	
Diabetes mellitus	24.4%	46.7%	0.000
Hypertension	15.1%	43.3%	0.000
Positive family history	40.2%	28.6%	0.017
Hypercholesterolemia	52.4%	36.2%	0.11
Hypertriglyceridemia	31.3%	26.2%	0.197
Smoking	60.2%	33.6%	0.000
Obesity	25%	13.9%	0.002
Low HDL	24.2%	35.9%	0.133

Table II: frequency of major in-hospital complication in two age groups

Complication	Frequency (%)		P. value
	Young(28-45)	**Old (46-100)**	
Cardiogenic shock	**9.5%**	**18.2%**	**0.113**
VSD	**0%**	**3.2%**	**0.270**
Acute pulmonary edema	**4.8%**	**15.6%**	**0.06**

In our study, Hypercholesterolemia and hypertriglyceridemia were more common in the young group, but the difference was not significant. In some studies,[2-3-4-5] high cholesterol is an important risk factor in young patients with AMI, but the difference of cholesterol level between the young and old patients with AMI in our study was not statistically significant.

Hypertension and diabetes mellitus were more common in our old patients as it was in most other studies.[2-4-6]

The in-hospital mortality rate of the young male patients in this study was low as it was in other studies[1-2], but the in-hospital mortality rate of the young females and old patients was relatively high.

In conclusion, cigarette smoking, positive family history and obesity were more common in young patients with AMI (in comparison with old patients), and overall in-hospital mortality rate was low in young patients with AMI.

References

1. Doughty M, Mehta R, Bruckman D, Dass, Karavite D, Tsai T, Eagle K; Acute myocardial infarction in the young – the university of michigan experience. Am Heart J 2002-Jan; 143(1) : 56-62.

2. Morillas PJ, Cabades A; Bertomeu V, Echanove I, Colomina F, Cebrian J, Perez G, Mota A, Sanchez FJ, Sanz JC; Acute myocardial infarction in patients under 45 years old. Rev ESP Cardiol 2002-Nov; 55(11): 1124-31.

3. Von Eyben FE, Mouritsen E, Holm J, Montvilas P, Dimcevski G, Helleberg I, Kristensen L, Suciu G, Von Eyben R; Smoking, Low density lipoprotein cholesterol, Fibrinogen and myocardial infarction before 41 years of age; J Cardiovasc Risk , 2002-Jun; 9 (3):171-8.

4. Miyamoto S, Goto Y, Sumida H, Yasuda S, Matsumoto T, Mori I, Diakoku S, Itoh A; risk factors and physical activity levels at the onset of acute myocardial infarction in young men. J Cardiol 2000-Aug; 36(2): 75-83.

5. Ranjith N, Verho NK, Verho M, Winkelmann BR; Acute myocardial infarction in a young south African-based population ; Curr Med Res Opin 2002; 18(4): 242-8.

6. Zimmerman FH, Cameron A, Fisher LD, myocardial infarction in young adults. J Am Coll Cardiol 1995-Sep; 26: 654-61.

7. Friedlander Y, Arbogast P, Schwartz SM, Marcovina SM, Austin MA, Rosendaol FR, Reiner AP, Psaty BM; Family history as a risk factor for early onset myocardial infarction in young women. Atherosclerosis 2001-May; 156(1): 201-7.

8. Elliott M, Antaman, Eugene Braunwald; Acute myocardial infarction in heart disease; 2001, W.B Saunders Company USA, P.1114.