Trend of acute myocardial infarction prevalence toward younger ages in Ahvaz

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Abstract

Objectives- The aim of this study was comparing the prevalence of ST elevation myocardial infarction in 1997 with the prevalence in 2010 considering age groups in the hospitals of Ahvaz Jundishapur University of Medical Sciences.

Methods- We considered the patients admitted with acute coronary syndrome at hospitals of Ahvaz Jundishapur University of Medical Sciences and all the patients with ST elevation myocardial infarction were included. We categorized the patients into six groups according their ages.

Results- 400 patients in 1997 and 243 patients in 2010 were included in this study. The prevalence of myocardial infarction has increased in patients younger than 35 years. There were no significant changes in the group of 35-45 years and group of 65-75 years. The most important changes in age distribution of myocardial infarction during 2010 were prevalence increasing in age group of 46-55 years and decreasing in age group of 56-65 years. During 1997, 17% of patients were patients older than 75 years while 27% of patients were older than 75 years in 2010.

Conclusions- Our data suggest that the prevalence of ST elevation myocardial infarction in age group of 46-55 years old has increased in Ahvaz. This change is especially prominent in male patients***(Iranian Heart Journal 2011; 12 (4):43-47)***.

Keywords: Myocardial Infarction■ Prevalence■ Age■Ahvaz

The world is in the midst of a true global cardiovascular disease epidemic.[1] Coronary Artery Disease (CAD) is the most common cause of death in the world.[2-4] CAD is responsible for approximately 30% of all deaths worldwide each year.[5] Almost 80% of these deaths occur in low and middle income countries, and half occur in women.[6]

The first cause of death in Iranian population is also ischemic heart disease. Myocardial infarction is the leading cause of morbidity and disability in Iranian society.[7]

Patients with myocardial infarction usually admit to public or private hospitals as emergency admissions.

There is some evidence that the number of patients admitted with acute coronary syndrome is increasing. Recently, Iranian ministry of health and medical education implemented different preventive measures including creating different centers for cardiovascular diseases control.[8]

Coronary artery disease often occurs in middle age which can lead to economic damage of family or society.[9]

CAD can impact national economy in two ways: First, direct cost of the medical care and second, indirect costs because a person with heart disease cannot be optimally productive at work and is absent from the work.

On the other hand, sudden cardiac death c cause loss of educated people or specialists. In countries where the Framingham study was conducted, myocardial infarction occurred only in 38% of CAD patient under age 75 years.[10] It seems that nowadays we see more patients with myocardial infarction in younger ages in Iran.

The aim of this study was comparing the prevalence of ST elevation myocardial infarction in 1997 with the prevalence in 2010 considering age groups in the hospitals of Ahvaz Jundishapur University of Medical Sciences.

Methods

Study population

We designed two cross-sectional studies. The first was performed on patients had been admitted with diagnosis of ST elevation myocardial infarction in CCUs of Razi hospital and Golestan hospital in 1997. The second was performed on cases had been admitted in CCUs of Razi hospital, Golestan hospital and Imam Khomeini hospital with diagnosis of ST elevation myocardial infarction in 2010.

We defined STEMI as presence of 1) prolonged resting chest pain 2) ST elevation in at least two contagious leads 3) rising of cardiac enzymes.

Age of patients was recognized by their identity card. We categorized the patients into six groups according their ages: 1) age < 35, 2) $35 \leq age \leq 45$, 3) $46 \leq age \leq 55$, 4) $56 \leq age \leq 65$ 5) $66 \leq age \leq 75$ 6) age > 75.

Ethics

The study protocol was approved by ethics committee of Ahvaz Jundishapur University of Medical Sciences. All patients provided written informed consent.

Statistical analysis

Continuous data were expressed as mean ± standard deviation values. Prevalence of ST elevation myocardial infarction was determined using descriptive statistics. Chi-square test was used to compare groups. A P value less than 0.05 was considered to be statistically significant.

Results

Among 2398 patients admitted with acute coronary syndrome in 1997, 400 patients with ST elevation myocardial infarction were enrolled. During 2010, 3733 patients were admitted with acute coronary syndrome and 243 patients had ST elevation myocardial infarction. Hence, Total numbers of 400 patients in 1997 and 243 patients in 2010 were included in this study. Table 1 shows comparison of the number of patients with STEMI during 1997 versus the patients during 2010 in age groups.

The prevalence of STEMI has increased about 2-fold in patients younger than 35 years. There was no significant change in the prevalence of STEMI in the patients of age group of 35-45 years. The most important prevalence change was observed in age group of 46-55 years. The prevalence of STEMI has increased from 28% to 35%.

The number of patients in age group of 56-65 years has decreased from 31% to 19% and in age

group of 65-75 years has decreased from 22% to 18%. 17% of patients with STEMI in 1997 were in group of older than 75 years but 27% of patients were older than 75 years in 2010.

The results show that the percentage of patients with age of less than 66 years has not changed significantly (74% versus 71%) but during 2010 most of patients were in \group of 46-55 years while during 1997 the most of patients were in group of 56-65 years (Fig. 1).

Comparing the male and female patient numbers in each age group in 2010 demonstrates that most of female patients were in group of 56-65 years while most of male patients were in younger age (Fig. 2).
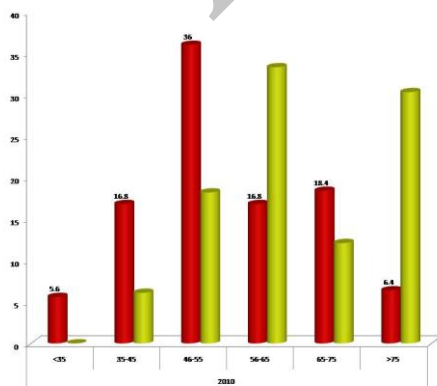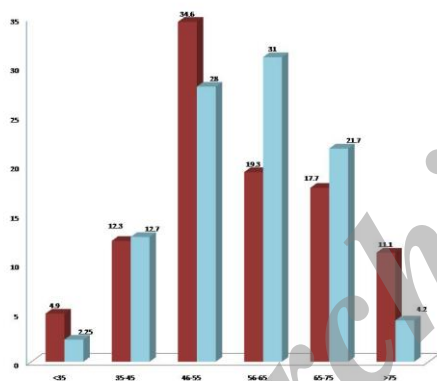
Discussion

Age distribution of patients admitted with STEMI during 2010 shows a trend toward young ages when we compare with the results during 1997. During 2010, 52% of our patients were younger than 56 years while it was 43% in 1997.

In Framingham study, only 38% of STEMI was occurred in patients with ages of less than 75 years while 89% of our patients were younger than 75 years. [10]

About 17% of our cases were patients aged less than 46 years old. It is comparable to other reports from Spain[11] (9%) and US[12] (10.4%).

The most important changes in age distribution of STEMI in Ahvaz during 2010 are increase of the rate in age group of 46-55 years and decrease of the rate in age group of 56-65 years. This age group contains the most expert and educated people working in the community. They have the most important role in country economy, industry and science production.

Although there are a few reports about increasing the rate of STEMI in younger ages, but most of studies have demonstrated the trend toward older ages in other countries. [13]

Hence, cardiovascular research centers of Iranian medical sciences universities have that important duty to find the ways to decrease the rate of myocardial infarction in Iran. They should do all their best to design practical protocols to control risk factors of atherosclerosis, stabilize the atherosclerotic plaques and prevent coronary artery disease progression.

Table I. Comparison of the prevalence of STEMI in 1997 versus 2010 in age groups

Age categories	1997	2010	P value
<35	9 (2%)	12(5%)	0.063
35-45	51(13%)	30(12%)	0.492
46-55	112(28%)	84(35%)	0.048[*]
56-65	124(31%)	47(19%)	0.001[*]
66-75	87(22%)	43(18%)	0.127
>75	17(4%)	27 (11%)	0.001[*]

[t][*]Statistically significant difference between two groups (P<0.05)

In our study, 21% of patients were female that is comparable to the reports from Poland and US (23.4% and 25.6%).[14]

The age distribution among female patients during 2010 was different from male group and was similar to age distribution of patients during 1997.

Our findings showed that STEMI hospital admission rate had decreased from 1997 to 2010 in CCUs of Ahvaz Jundishapur University hospitals but the number of patients admitted with acute coronary syndrome had increased. This may be explained by some reasons that should be assessed in future studies. First, the knowledge of the population has improved and they come to hospital at earlier stage. Second, a better availability of emergency wards can be led to an earlier admission with acute coronary syndrome

and management with drugs like ASA, beta blockers and anticoagulants can decrease the rate of STEMI.

Study limitations

First, we did not enroll the patients admitted at other hospitals especially private hospitals. Second, we enrolled only patients admitted at hospitals and we did not consider persons who died at home or during transfer to emergency ward. So selection bias is a big limitation of our study.

Conclusion

According to our data, the prevalence of ST elevation myocardial infarction in age group of 46-55 years old, especially in male patients, has increased in Ahvaz. This age group contains the most expert and educated people who are very important in country economy, industry and science production.

Acknowledgment

References

1. Bonow RO, Smaha LA, Smith SC , Mensah GA, Lenfant C. World Heart Day 2002: the International Burden of Cardiovascular Disease: Responding to the Emerging Global Epidemic. Circulation 2002; 106:1602-1605.

2.   Braunwald E. Shattuck lecture: Cardiovascular medicine at the turn of the millennium: Triumphs, Concerns, and Opportunities. N Engl J Med 1997; 337 (19):1360-9.

3.   World Health Organization. Revised global burden of disease 2002 estimates. [(Accessed June 29 2008)]. Available at: http://www.who.int/healthinfo/bodgbd2002revised/en.

4.   Chockalingam A, Balaguer-Vinto I. Impending global Pandemic of Cardiovascular Diseases: Challenges and Opportunities for Prevention and Control of Cardiovascular Disease in Developing Countries and Economies in Transition. World Heart Federation. Barcelona: Prous Science; 1999.

5.   World Health Organization. The World Health Report2002: Reducing Risks, promoting Healthy Life. Geneva: WHO; 2002.

6.   Naghavi M, Jafari N. Death Profile in Iran, 2005. Tehran: Iranian Ministry of Health; 2007.

7.   Karimi AA, Ahmadi H, Davoodi S, Marzban M, Abbasi K, Movahedi N, Salehi Omran A, Shirzad M, Abbasi SH, Lotfi-Tokaldany M. Tehran Heart Centre adult cardiac surgery database: a report of 5-year registry. Paper present at the 19the Scientific Session of the Saudi Heart Association. Riyadh, Saudi Arabia; 2008.

8.   Zachariah JP, Vasan RS, D'Agostino RB. The Burden of increasing worldwide cardiovascular disease. Fouster V, O'Rouke RA, Walsh RA, Wilson PP (editors). HURST's THE HEART. 12th edition. McGraw-Hill Company. 2008; 18-26.

9.   Richmond (2006). "Obituary: Thomas Royle Dawber". BMJ **332** (7533): 122. doi:10.1136/bmj.332.7533.122.

10.   Okrainec K, Banerjee DK, Eisenberg MJ. Coronary artery disease in the developing world. Am Heart J 2004; 148:7-15.

11.   Pineda J, Marin F, Roldan V, Valencia J, Marco P, Sogorb F. Premature myocardial infarction: clinical profile and angiographic findings. Int J Cardiol 2008; 126(1): 127-9

12.   Doughty M, Mehta R, Bruckman D, Das S, Karavite D, Tsai T, et al. Acute myocardial infarction in the young the university of Michigan experience. Am Heart J 2002; 143(1): 56-62.

13.   Choudhury L, Marsh JD. Myocardial infarction in young patients. Am J Med 1999; 107(3): 254-61.

14.   Rosamond W, Broda G, Kawalec E, Rywik S, Pajak A, Cooper L, et al. Comparison of medical care and survival of hospitalized patients with acute myocardial infarction in Poland and the United States. Am J Cardiol 1999; 83(8): 1180-5.