

Effective Factors on the Incidence of MI and Causes of Delayed Referring of the Patients to the Mazandaran Cardiac Center in 2009

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Abstract: Considering the complication of coronary artery disease, the aim of this study was to investigate the predisposing factors, the effective factors of MI and the reason of the patients' delay in referring to Mazandaran Cardiac Center in 2009. This cross-sectional study was done on 200 patients with acute MI. The demographic information and factors effective on MI and the reason of delay in referring to health care center. were recorded in questionnaire. All of the information after coding analyzed with SPSS soft ware using X² test and ANOVA test. Of 200 cases under study, 57% were male and 43% female, with mean age and BMI of 62.02 years and of 26.66 respectively. Incidence of MI in 24% of the cases occurred at 8-12 AM. In this study 51% of the patients had 2 hours delay of referring to cardiac center and 37.5% more than two hours. The accelerating and effective factors of MI were as fallow: heavy physical activity (25.3%) and sudden wake up (25.2%). The reason of delay in referring to cardiac center was the lack of knowledge from the sign and symptom of MI (24%) and being alone at the onset of MI (10.5%). The day of attack in 21% of the cases was on Friday (a holiday in Iran) and on Monday (18.5%). Necessary education to the public about the predisposing factors of MI and knowing the reason of delay in referring to cardiac center, proper strategy be implemented to reduce the rate of MI.

Key words: Effective factors • Incidence • MI • Cause of delayed referring • Cardiac Center

INTRODUCTION

Coronary artery disease (CAD) particularly of MI is the reason of mortality in developing countries. This disease not only results in mortality, but in ability and production reduction in individuals. MI results due to proper coronary artery blood circulation due to coronary artery clog because of atom following elongation of ischemia in myocardium and heart tissue necrosis [1]. Annually 1.5 million American get myocardial infarction of them 35% die. Incidence of myocardial infarction following coronary artery disease is increasing in Iran, in a way that 317000 diet in Iran in 2001 in other word 166 deaths in a day [2]. Findings have showed that majority of them died within 2 hours after attack and half of the death occurred up to reaching the hospital [3]. Studies indicated that various risk factors in process of this disease which

are as follow: sex, age, family history and race, obesity, smoking, diabetes high blood pressure and hyper lipidemia oral contraceptives, mental condition and the behavior of the person susceptible to MI [4].

The type and degree of effect of heart risk factors varies in different societies and races. In fact onset of acute MI has close relation with rate of knowledge, custom, culture, socioeconomic conditions, life style and the mental and behavior of the people in a society. For example in the countries where men under 60 years drink alcohol till late at night and are heavy smoker, the incidence of MI is at rate night [5].

Study of MI risk factor and rate of knowledge and way of prevention play important role. In this regard studies have been done in Iran [6-11]. About the effective factors of MI, time of reaching to hospital and implementation proper treatment procedure which play

very important in the worsening of the disease and/ or resuscitation of MI patients and the reason of delay to the Medical center needs further studies. Knowing the incidence of MI in low age individuals in Iran (particularly under 40 years ago), study of the MI predisposing factors is very important. Because early MI diagnosis not only reduces the progress of the disease, but also prevent the complications such as cardiogenic shock, cardiac arrhythmia disorder and threatening arrhythmias. Therefore, the researchers believe that further studies about the different aspect of acute MI from the view point of predisposing factors and the effective factors on MI and the reason of delay referring to hospital in Iran is necessary. Hence, this study aims at to determine the factors effective on MI incidence and the reason of delay in referring to cardiac center in 2009.

MATERIALS AND METHODS

This is a cross-sectional study. The studied subjects were all of the patients referring to Mazandaran cardiac center and diagnosed for acute MI by cardiologist and at least 48 hours have passed of their admission and had no mental disorder.

Sampling method has been the available method. That is the researchers selected the cases at the cardiac center and continued till collect required number of the cases (n=200). Ideal number of cases for study was obtained by referring to the relevant literatures and references 7 and 8.

Method of data collection was by observing the patient, interviewing and using the questionnaire consisting of demographic information, MI onset time and the implemental procedures at the time of MI incidence. The risk factors of coronary artery disease (acute MI) includes: family history, race, age, sex, obesity, smoking, mental disorder anger-emotion, mental work, time period of referring, how being referred and the reason of delay such as, delay in reaching of ambulance car, traffic, self treatment avoidance in referring to hospital etc. reliability of the questionnaire was approved by the cardiologist and its durability by using the repeat test and α -crohnbach ($\alpha=70\%$). All of the collected data were coded and analyzed by X^2 test and ANOVA test using SPSS software.

RESULTS AND DISCUSSION

Of total 200 patients under study, 57% were male, 52% illiterate and 87% married. Mean weight was 72.6 kg and mean BMI 26.6 and 49% of the subjects were

Table 1: Absolute and partial frequency distribution of the subjects under study based on the history of particular diseases effective on MI

Disease	Frequency	Percentage
High blood pressure	53	36.8
Diabetes mellitus	34	23.6
Kidney disease	7	4.9
Others	50	34.7
Total	144	100

Table 2: Absolute and partial frequency distribution of the subjects under study based on the time of MI incidence

Time of MI incidence	Cases	Percentage
0: 1-4	16	8
4: 1-8	43	21.5
8: 1-12	48	24
12: 1-16	32	16
16: 1-20	39	19.5
20: 1-24	22	11
Total	200	100

Table 3: Absolute and partial frequency distribution of the subjects under study based on the risk factors of MI

Risk factors	Frequency	Percentage
Lack of activity	3	3.1
Stress	13.4	13.4
Hyper lipidemia	6	6.2
Smoking	8	8.2
High blood pressure	24	24.7
Diabetes mellitus	14	14.4
History of family disease	14	14.4
More than one case	15	15.6
Total	97	100

housewife or jobless. Also 61% were living with their spouse and siblings and 8.5% were living alone. Monthly income was 55.5% less than needed amount and 13.5% enjoyed their children financial support. Even. 98.5% of the patients had MI for the first time. Table 1 shows the absolute and partial frequency distribution of the subjects under study based on the history of particular disease effective on MI incidence. Time of MI on day/night is given in the table 2.

Finding indicated the important point that the main cause of MI is severe high blood pressure (24.7%) diabetes mellitus stands the second cause (15.5%) statistical analysis indicated that there is significant relationship between MI and history of relevant disease ($P=0.000$) and of work place $P<0.001$. table 3 shows incidence of MI with number and percentage.

Table 4: Absolute and partial frequency distribution of the subjects under study based on the predisposing factors in MI incidence

Predisposing factors	Frequency	Percentage
Mental stress	17	10.7
Anger	16	10.1
Smoking	6	3.8
Sudden wake up	40	25.2
Heavy physical activity	40	25.2
Nervousness	20	12.6
High emotion	9	12.6
More than one factor	11	6.9
Total	159	100

Table 5: Absolute and partial frequency distribution of the subjects under study based on the reason of delay in referring to cardiac center

Reason of delay	Frequency	Percentage
Delay of ambulance	1	1
Road traffic	2	2.1
History of cardiac disease	3	3.2
Lack of belief in referring to health center	1	1
Being alone at the onset of attack	21	21.5
Self treatment	3	3.1
Lack of knowledge from the nature of disease	48	49.5
Specifying self recovery	14	14.5
More than one cause	4	4.1
Total	27	100

Our findings showed that the main enhancer (predisposing factor) in incidence of MI is heavy physical activity (25.2%), sudden wake up (25%). Statistical analysis of the obtained data revealed that there is significant relationship between MI and occupational condition $P<0.001$, MI onset time ($P=0.001$) and the work place $P<0.0002$. Table 4 shows the predisposing factors of MI.

Delay of referring to the hospital was as follow: 51.5% of the patients in less than 2 hours, 11% for 2 hours and 37.5% more than 2 hours.

Analysis of the obtained data revealed that there is significant relationship between time of delay referring to hospital and married status $P=0.00$, family history of cardiac disease ($P=0.005$) and occupational condition ($P<0.001$). The reason of delay in referring to cardiac center is shown in table 5. Analysis of the obtained data has approved the significant relation between the reason of delay of the patients life condition (living with family and alone) and occupational condition $P<0.0001$ and $P=0.000$.

Findings showed that time of MI was more on Friday (a holiday in Iran), (21%). Mean while 27.5% of the MI took place on the holidays of Iran.

Different factors are involved in the incidence of CVDs. Majority of the studies have proved the role of predisposing factors in MI [12]. Diabetes mellitus, kidney and congenital diseases and hypertension are the leading cause. This study revealed hypertension a major cause of MI (36.8%) and diabetes mellitus the second causing agent (23.6%). Many studies suggested the role of predisposing factors in MI [12, 13 and 14]. In this study the main MI accelerators were heavy physical activity and asleep disorder. Findings of Rahmani *et al.* (2006) correspond with the mentioned accelerators, but differs with our findings. In their study stress was the major enhancer of this disease [7]. Work place, life style, occupation, living place etc. are the main factors with various degrees of effects in different societies.

Studies have suggested the way of wake up and depression the major enhancer of MI, which nearly corresponds our findings.

In our study, 37.5% of the patients had more than 2 hours delay in referring to hospital due to lack of knowledge on nature of disease (the main cause of delay), indicating the inefficiency of the multimedia and educational groups in giving information to the public. Being alone at the time of MI was the second reason. Tagadasi and Rahmani reported the expecting the self recovery a main reason of delay in referring to hospital [7, 8].

Robert and Mac (2000) in Eskatland, found that general physicians are responsible for delay of cardiac patients to hospital because of their improper diagnosis of the disease [10]. Only in 5% of the patients Ambulance car was responsible for delay. While Naghdi showed that most of the delay time is on the part of those who requested the emergency car. In comparison, those who indirectly called Emergency car the patients reached 1.3 hours sooner to the cardiac center [15]. In this study MI occurred at 8-12 AM (24%), which is approximated similar to the report given by Rahmani [7] and Mojarab [16].

In this study most cases of MI occurred between 12:00-10:00 PM. While Taleghani reported 8-12 AM the most incidence time of MI [17]. These similar finding indicate the start of stressful work with in the morning. Opening of the health center in the morning or expecting recovery during the night and the hypothesis that, really particular pathophysiologic changes take place in the morning that accelerate development of MI, requires further studies. We found that most of MI occurs on Friday (21%), but Ramzani reported on Saturday [7] and Chyang on Monday [18]. Excitements and emotional problems on the holiday, smoking, using narcotics, heavy

physical activities in those lacking physical fitness and sleep disorder on Friday are the effective cause in MI incidence. Though there data don't correspond the finding reported elsewhere that stressful work pressures on heart. Since MI do not have one certain cause, it is impossible to attribute it to a certain day and to a certain factors. Considering the predisposing and accelerating factors of cardiac conditions, education to the public on these causing agents and expecting nature of the disease are necessary. The reason of delay in referring to hospital should be identified to implement scientific and practical approach to solve the problem. Since in this study, lack of knowledge to this disease has been the main cause of delay in referring to health clinic, the media and consultation centers have crucial role in this important issue. Meanwhile to reduce the other reasons of delay, proper ways must be considered. Emergency centers should be made more active. Improving the road traffic problem and avoidance of un-logic believes are the solutions suggested to the administrators.

REFERENCES

1. Available from: http://www.nhlbi.nih.gov/health/dci/.../Cad/CAD_WhatIs.htm. Accessed February 2009.
2. http://www.medicinenet.com/coronary_arter_disease_screening_tests_cad/article.htm. Accessed January 2010.
3. Jafari, H., A. Shafipour, N. Rastgarnia, *et al.*, 2009. The relation between BMI with exercise text in individuals with cardiac Ischemic pains. *J. Mazand Univ. Med. Sci.*, 19(68): 64-69 (Persian).
4. Jafari, H., 2008. Cardiac Health condition in Patients referring to the Mazandaran Cardiac center with unusual chest pain. The 14th word congress of Anesthesiologists. South Africa.
5. Jafari, H., 2009. Unusual chest pain in the patients referring to the Mazandaran Cardiac center in 2007. 16th international conference of Indian Association of Palliative care. New Delhi India, 13th-15th February.
6. Braunwald, E., D.P. Zips and P. Libby, 2001. Heart disease. A textbook of cardiovascular Disease. 6th ed. W.B. Saunders Co.
7. Kinj, K. and H. Sato, 2001. Circadian variation of the onset of acute MI in Japan. *Osaka.*, 65(7): 617-620.
8. Poursheykhan, M., MT. Moghaddamnia and F. Nasirzadeh, 2008. Duration of chest pain to hospitalization in cardiac center, in acute myocardial infarction cases admitted in Rasht in 2005. *J. Leg. Medi. Islamic R Ir.*, 48(13): 228-234 (Persian).
9. Rahmani, R., Z. Hamidi, A.A. Karimi Zarchi, *et al.*, 2006. Evaluation of Trigger factors incidence of time and Delaying factors in patients with Acute Myocardial Infarction. *KOWSAR Med. Sci. J.*, 3(11): 273-278. (Persian).
10. Taghadosi, M., M. Seyedi and GhA. Mosavi, 2007. Assessment of delayed treatment in patients with acute myocardial infarction at Khashan Shaheed Beheshtee Hospital During 2003-2005. *Feyz. J. Kashan. Univ. Medi. Sci.*, 3(11): 45-51 (Persian).
11. Salehian, M., AR. Danesh and M. Hasanzadeh, 2005. Circadian variation in the onset of acute myocardial infarction. *J. Ghonabad Univ. Medi. Sci.*, 2(11): 41-44 (Persian).
12. Shahamfar, J. and Sh. Hakim, 1998. Survey of awareness of patients suffering from MI about risk factors and the role of health education in the prevention of CAD. *J. Tabriz Univ. Medi. Sci.*, 39-40(32): 57-63 (Persian).
13. Maasomi, M., Y. Nikian and H. Hosseini, 2002. The causes of delaying hospital Admission of patients with Acute myocardial infarction to the hospital in Kerman city. *J. Rafsanjan Univ. Medi. Sci.*, 4(1): 252-259. (Persian).
14. Robert, J. and T. Mac, 2000. Causes of Delay in the Treatment of Acute Myocardial infarction of a cardiology project by Tina-M University Aberdeen, pp: 40-64.
15. Mojarad, M.R., Evaluation of incidence of daily Acute Myocardial infarction in the patient of Khashan Hospital (1374-5) (Persian).
16. Taleghani, F., 2004. Evaluation of pain in circadian rhythms in acute Myocardial infarction 6th congress of cardiovascular: Mashhad. (Persian).
17. Chiang, H.T., 1999. Circadian and weekly variations in pain onset of acute myocardial infarction. *Zhonqhua yi zue za zhi Taiwan.*, 62(6): 334-340.