Original Article

Comparison of serum Homocysteine concentrations between smoker and nonsmoker patients with acute coronary syndrome in Tabriz Shahid Madani Hospital during 2008-2009

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Abstract

Background: *According to previous studies elevated blood total homosyteine has been suggested to be an independent risk factor for cardiovascular disease. The aim of this study was evaluation of homosyteine serum in smoker and nonsmoker patients with acute coronary syndrome (ACS).*
Methods: *Eighty five patients were enrolled in this study .Forty eight patients (21smoker and 27non-smoker) diagnosed with acute myocardial infarction (AMI), 37 patients (14smoker and 23non-smoker) with unstable angina (UA) that admitted in Shahid Madani Heart center in Tabriz in 2008-2009. The mean age of patients with AMI and UA were 61.83±13.78 and 59.90±11.95 years, respectively. Homocysteine serum Levels were measured by Hitachi Auto analyzer.*
Results: *The mean age of patients with AMI was 61.83±13.78 years and in patients with UA was 59.90±11.95 years (p=0.53). Mean serum levels of homocysteine were not significant difference between AMI and UA patients (17.61±11.25 µmol/L vs. 22.25±12.44, p=0.78). There was also a significant correlation between high levels of homocysteine with AMI and UA diseases in comparison with normal reference values. There were not statistically significant differences in serum homocysteine levels between smoker and nonsmoker patients in both AMI and UA groups.*
Conclusion: *The Mean levels of Homocysteine in AMI and UA groups were not significantly different. Our study showed age of smoker patients in AMI and UA groups were significantly lower than nonsmoker patients.*
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Introduction

Cardiovascular disease is the major cause of mortality in industrial community. Diabetes mellitus, smoking, serum lipids, and blood pressure are major risk factors for cardiovascular disease in both sexes. Smoking had a much larger relative detrimental impact in women, and the risk gradient associated with increasing number of daily cigarettes was larger.[1] Smoking in myocardial infarction compared with unstable angina is important factor.[2] Homocysteine increases the risk of mortality in middle-aged men and the risk increases when associated with other risk factors.[3] The most epidemiologic studies showed relationship between serum levels of homocysteine and Cardiovascular disease.[4-10] But in some other studies, relationship between serum levels of homocysteine and cardiovascular disease are rejected.[11] Association serum homocysteine level and cardiovascular disease are still controversial. Some studies have shown that serum level is positively associated with age.[10] Research has shown that total and free serum homocysteine level in smokers higher than those in non-smokers.[9] Considering importance of cardiovascular diseases and role of smoking and homocysteine as risk factors of cardiovascular diseases, aim of this study is to evaluated serum levels of homocysteine in smoker and nonsmoker patients with acute myocardial infarction (AMI) and unstable angina diseases (UA).

Methods

We collected blood samples of patients admitted with acute myocardial infarction and unstable angina patients in Shahid Madani hospital between 2008- 2009 (48patients with MI and 37 patients with UA diagnosis). Patients with MI and UA syndrome were classified in to two groups according to their smoking status. After separating sera by centrifuge, they were stored in -70 c until analysis. Serum concentrations of homocysteine were assessed by Hitachi Auto analyzer. SPSS software - version 14.0 was used for statistical analysis and means of serum level of homocysteine between smoker and non smoker MI and UA patients were compared with paired T-test. P- value <0.05 was considered significant.

Results

85 patients were enrolled in our study, 63 men with mean age 57.85±11.80 years and 22 women with mean age 69.20±12.54 years. The Mean age patients with MI (21smoker and 27non smoker) were 61.83±13.79 years and The Mean age of patients with unstable angina (14smoker and 23nonsmoker) were 59.90±11.95 age. Table 1 shows frequency of risk factors of cardiovascular diseases in patients with unstable angina and myocardial infarction in this study.

Table 1- Frequency of risk factors of cardiovascular diseases in patients with unstable angina and acute myocardial infarction in this study

Risk factors	AMI (48 patients)	UA (37 patients)
Hypertension	12	20
Hyperlipidemia	16	10
Family history of cardiovascular diseases	12	10
Diabetes	6	7

In our study, there was also a significant correlation between Hypertension and AMI and UA syndrome. (p=0.006) Relationship between Hyperlipidemia, Family history, smoking, Diabetes and death in hospital among MI and UA were not significant.
Table 2 summarizes our data on homocysteine in serums and ages in patients with acute coronary syndrome

Table 2- Results of tests in patients with unstable angina and acute myocardial infarction in this study

Parameters	MI	UA	P
Homocysteine	17.61±11.25	22.25±12.44	0.78
Age (years)	61.83±13.78	59.90±11.95	0.53

We didn't find significant difference in mean of serum Homocysteine concentration and age between UA and MI patients. According to statistical analysis, difference of mean of serum

Homocysteine concentration (p=0.006) and age (p= 0.001) between women and men with acute coronary syndrome were significant. There was significant difference between mean of age in smoker patients and nonsmoker patients with acute coronary syndrome (55.82 ± 10.06 vs 65.63 ± 13.64 years) but other measured parameters did not have significant difference in smoker patients and nonsmoker patients with acute coronary syndrome. We saw a significant correlation between High levels of Homocysteine concentration in relation to normal people with AMI & UA patients (p=0.05). The mean of Homocysteine concentration between smoker and nonsmoker patients with AMI, Also between smoker and nonsmoker patients with UA were not significantly different. (Table 3)

studies. In accordance with the statistical analysis, the difference of age and means of homocysteine level, between the sexes (men and women) were significant, which conforms in previous studies.[3-9] We saw no significant relationship between age, the mean homocysteine level, blood pressure, hyperlipidemia and family history of heart disease. The mean ages of smoker patients were less than in nonsmoker patients that difference was statistically significant. It was not observed statistically significant difference in mean homocysteine level between smoker and nonsmoker patients that was coordinated with previous studies, including Christensen etal study.

Table 3- Values of tests in smoker patients and nonsmoker patients with UA and MI syndrome

	AMI			UA		
Parameters	Smoker	Nonsmoker	P	Smoker	Nonsmoker	P
Sex (men/women) (person)	20/1	16/11	0.006	14/0	13/10	0.006
Hypertension (+/-)(person)	4/17	8/19	0.51	7/7	13/10	0.69
Hhyperlipidemia (+/-)	8/13	8/19	0.55	5/9	5/18	0.45
Family history of cardiovascular diseases (+/-)	8/13	4/23	0.95	4/14	6/17	0.86
Diabetes (+/-)	3/18	3/24	0.74	4/10	3/20	0.39
Age (years)	56.60±10.22	66.81±15.07	0.016	54.71±10.09	64.18±11.92	0.026
Homocysteine (µm/L)	21.32±5.88	27.28±16.43	0.26	20.82±13.87	15.30±8.49	0.12

Discussion

Considering importance of cardiovascular disease and the role of smoking in cardiovascular disease as a risk factor and also increasing homocysteine levels in smoker patients, we studied the homocysteine level in smoker and nonsmoker patients separately in two groups with unstable angina and acute myocardial infarction. From previous years, increased levels of serum / plasma homocysteine (tHcy) were known as an independent risk factor for cardiovascular disease but its mechanism is not yet clear. High levels of serum homocysteine increase the risk of mortality in middle-aged men and when associated with other risk factors, risk increased more.[3-9] The means of homocysteine levels and age between AMI and UA patients in our study did not differ significantly that agreemented with Voutilainen etal and Tutgan etal

Higher levels of homocysteine than normal reference values and non-significant difference between MI and UA patients are consistent with previous studies. In our study, age of smoker patients was less than non-smokers patients that show the importance smoking as risk factor heart disease that this issue confirms previous studies.

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