Blood Uric Acid Levels According to Cardiovascular Disease Risk Factors in Patients with Myocardial Infarction

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Abstract

Background- Hyperuricemia is accompanied by many cardiovascular risk factors. However, the relationship between them, especially with acute myocardial infarction has not been confirmed. The aim of this study was to measure the blood uric acid level in myocardial infarction patients, as well as determine the frequency distribution of blood uric acid levels in our subjects according to their sex, age, smoking habit, blood sugar level, blood lipid level and systolic/diastolic blood pressure.

Method- The study is a descriptive–analytic research with easy, non–random sampling. The data was extracted from the patients' files with myocardial infarction in Zanjan Beheshti Hospital in 2001, and analyzed by calculating measures of central tendency and variability.

Results- The mean blood uric acid level in men was 8.23mg/dl (SD=2.13; reliability: 14.5-3.5) and 8.23mg/dl in women (SD=2.21; reliability: 14.9-4.5). It had a negative relationship with cholesterol level, but had a positive relationship with age, blood pressure, triglycerides and fasting blood sugar. However, these relations were not meaningful. There was a meaningful relationship between high blood pressure history and hyperuricemia (P=0.0005), as well as a significant difference among age groups regarding blood uric acid level (P=0.024), but this was not significant for women (P=0.066).

Conclusion- There is a meaningful relationship between hyperuricemia, hypertension and advancing age in men, but blood uric acid level has had no relationship with other risk factors ***(Iranian Heart Journal 2007; 8 (1): 43-45)***.

Key words: hyperuricemia ■ cardiovascular risk factors ■ myocardial infarction

Despite considerable progress in the diagnosis and treatment of acute myocardial infarction, it remains a risk factor in industrial countries, and it has become a difficult problem in developing countries. Of the total deaths in this country in 1996, 74,555 cases were cardiovascular-related. This figure comprises 35.89% of the total deaths in Iran.[2]

There has been a great effort to reach the international standards for the prognosis of such disease in this country.

For the first time after Framingham studies in 1960's cardiovascular risk factors were considered on an individual basis.[1]

Accordingly, obvious atherosclerosis risk factors include high blood lipids, smoking, hypertension, diabetes mellitus, age and sex.

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Also, the new risk factors of atherosclerosis are inflammatory signs, fibrinolytic function, homocysteine and probably uric acid.[1] The importance of serum uric acid as a risk factor in producing cardiovascular disease was mentioned by Gertler et al. about 50 years ago.[3] In several prospective studies, the relationship between basic hyperuricemia, the incidence of coronary heart disease and death has been suggested. However it has not been proved that uric acid is a definite risk factor for cardiovascular disease.[4]

Method

The current research is a descriptive-analytic study. The site of the research is the cardiology ward of Beheshti Hospital, and the subjects are patients with myocardial infarction. Sampling is easy and non-random. To collect data, we distributed a number of questionnaires, and used 256 patient files. To determine the correlation coefficient between blood uric acid level and the presenting symptoms, we used Pearsson correlation formula and compared individual risk factors with blood uric acid level using chi square test.

Results

In the study, 265 patients (205 men, 77.36% and 60 women, 22.65%) were studied. The minimum age was 22 years and the maximum was 98 years. The mean uric acid level for both sexes was 8.26 mg/dl, with SD: 2.15. The mean uric acid level in men was 8.23 mg/dl (range 3.6 to 14.5) and in women, it was 8.3 mg/dl (range: 4.5 to 14.9); SD was 2.13 and 2.21 respectively. In the study, blood uric acid level in men and women was not significantly different (P=0.68). Uric acid in 75 patients was less than 7 mg/dl and in 190 patients it was 7 mg/dl or more. Uric acid level higher than 7 mg/dl did not have a meaningful relationship with smoking, blood sugar higher than 126 mg/dl, hypertension, hypercholesterolemia and hypertriglyceridemia. The mean uric acid level in people with a hypertension history was 8.93 mg/dl and in those without such a history was 7.99 mg/dl, the difference being significant (P=0.0005, see Table I).

Table I. Uric acid levels in patients with and without history of hypertension.

Uric acid / Hypertension history	No.	Mean	SD	P-Value
YES	90	8.93	2.08	0.0005
NO	152	7.94	2.14	0.0005

There was a meaningful relationship between blood uric acid level and age (P=0.024); with advancing age blood uric acid level increased. The relationship was stronger for men than for women (P=0.048, 0.066); see Table II.

Table II. Blood uric acid levels with age groups.

Age group	No	Mean	SD
Less than 40	5	6.600	3.169
40-49	47	8.138	2.235
50-59	52	8.690	1.976
60-69	77	7.783	1.855
Over 70	84	8.600	2.298

Discussion

In our study blood uric acid level was not significantly different in men and women, but it increased with age. There was, on the other hand, a positive correlation between hypertension history and hyperuricemia. Such relation has been observed in Caucasian populations[9] and in Woo's study.[8] Wannumethee found a weak relationship between serum uric acid and hypertension. This was done after adjustment for BMI and other factors.[7] In a multivariate study with BMI and anti-hypertensive drugs taken as main factors, little relationship was found between uric acid level and hypertension.[10] Cappuccino et al. found a relationship

between hyperuricemia and increased absorption of sodium in the kidney. There is a relationship between hyperuricemia and hypertension.[6] Borona in a study in Verona found a positive correlation between blood uric acid and hypertension.[1] However in our research the relation between the two was not meaningful. Bengtsson did not find a relationship between blood uric acid and other cardiovascular risk factors in Sweden.[12] Although in the latter case, it was found that increased uric acid level may be related to increased risk of diabetes,[13] we found no meaningful relationship between diabetes and hyperuricemia.

In our study, like that of Bengtsson, no meaningful relationship between serum uric acid and smoking was observed. In Toron's study the difference between smokers' and non-smokers' blood uric acid was significant.[5] Blood uric acid level was negatively related to blood cholesterol level by Pearson correlation formula. The results reached by Toron were similar to our.[5] Wannamette et al, found a meaningful relationship between uric acid, cholesterol and triglycerides,[7] contrary to our study.

We believe that a causal concept needs special attention because a risk factor must be dealt with long before the manifestation of the disease. Therefore, more longitudinal and prospective studies are needed to find a causal relationship between blood uric acid and myocardial infarction. If a causal relation between blood uric acid and myocardial infarction is found, we can reduce the number of cardiovascular episodes by prescribing drugs which decrease its level. We also suggest more case-control studies in order to understand treatment effects.

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