

## Uric Acid Levels Association with Different Risk Factors of Acute MI

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### Abstract

**Objective:** To determine the association between serum uric acid (UA) levels and different risk factors of acute myocardial infarction (AMI).

**Methodology:** Cross sectional study was containing on 120 patients with newly diagnosis of acute myocardial infarction and carried out in Department of Cardiology of Liaquat university of Hospital Hyderabad with the duration of time from 15th June 2015 to 14th October 2015. All with age between 30 to 50 years either both gender were incorporated in the study. Serum uric acid was assessed through blood sample from Research and Diagnostic laboratory of Liaquat University of medical and health science. All the data was entered in the proforma.

**Results:** Mean age of the cases was  $43.36 \pm 6.11$  years, male were found in the majority 66.67%. UA concentration was significantly higher in the male as compare to female  $P$ -value 0.02. According to the risk factors of the myocardial infarction high concentration of UA concentration was found in hypertensive  $7.1 \pm 1.5$  mg/dl and those who were noted with multiple risk factors  $7.7 \pm 1.8$  mg/dl, following by Diabetes, obesity, dyslipidemia, smoking and Alcohol as:  $6.1 \pm 1.0$  mg/dl,  $6.9 \pm 1.2$  mg/dl,  $6.7 \pm 1.3$  mg/dl and  $7.0 \pm 1.6$  mg/dl respectively. While in the diabetes and family history cases uric acid was found with normal levels.

**Conclusion:** Elevated UA is highly associated with different risk factor of acute MI. From this inference uric acid level should be monitored in all risk factors especially in hypertension and multiple risk factors.

**Keywords:** Acute MI; Risk factors; Uric acid

### Introduction

AMI is the very important cardiovascular emergency comes in the hospitals. Its most important risk factors are such as, diabetes, hypertension, smoking, obesity, and the dyslipidemia [1]. Prevalence of the ischemic heart disease is on rise in Pakistan as well. Prevalence of IHD in Pakistan varies from 11.2% in rural areas to 26% in urban areas [2,3]. UA might be a vital contributing variable to the development of atherosclerosis and the complications of it like as hypertension, renal problems and CVD. UA role such as a danger element for MI was uncertain until the aftereffects of Rotterdam study demonstrated that high serum UA concentrations were connected with MI and stroke risks [4]. In another study UA was observed to be essentially high ( $P < 0.001$ ) in cases having hypertensive with ischemic coronary disease. The mean quantities were additionally observed to be high in normotensive patients with IHD however the distinction was not significant statistically [5]. Serum UA concentrations are expanded in patients with IHD. Levels likewise raised with age, overweight, consumption of alcohol in large quantity, joined hyperlipidemia, hypertension and DM. These group of variations from the average thus altogether expand the atherosclerotic vascular infections risk, like MI and the stroke [6,7]. Cases having arterial hypertension and no determinable cause are said to have essential hypertension, which is observed to be connected with expanded levels of serum UA. Concentration of UA more than or equivalent to 5.2 mg/dl was found

to freely grant a 3.5-fold increased danger for death due to cardiovascular events within the period of 5 years [8,9]. In most of the studies hypertension is highly associated with increased uric acid level in the myocardial infarction. Therefore purpose of present study was to evaluate the UA concentration according to different risk factors in cases having AMI.

### Methodology

This cross sectional study was containing on 120 patients with newly diagnosis of acute myocardial infarction were selected in the study. This study has been carried out in the cardiology department of Liaquat university of Hospital Hyderabad with the duration of time from 15th June 2015 to 14th October 2015.

All the cases after diagnosis of first acute myocardial infarction, and with age between 30 to 50 years either both gender were incorporated in the study. All the cases having stable or unstable angina, chronic liver disease, renal failure, BPH, age more than 50 years, pregnant women and any history of radiations or chemotherapy were excluded. After complete clinical and medical history and physical examination all the routine lab investigations were carried out. Serum uric acid was assessed through blood sample from research diagnosis laboratory of Liaquat University of medical and health science. UA concentrations were categorized according to different risk factors of myocardial infarction as diabetes, hypertension, family history, obesity, dyslipidemia, smoking, alcohol consumption and multiple risk factors. All the data was entered in the proforma.

## Results

Mean age of the cases was  $43.36 \pm 6.11$  years, male were found in the majority 66.67% as compare to female 33.33% (Table 1). Majority of the cases were found with hypertension 22(18.33%) and multiple risk factors 31 (25.83%), following by diabetes, Family history, obesity, dyslipidemia, smoking and alcohol, with percentage of 13(10.83%), 05(04.16%), 06(05.00%), 08(06.66%), 10(08.33%) and 05(04.16%) respectively (Table 2).

Gender	Frequency	Percent	Age
Male	80	66.67%	Mean $\pm$ SD
Female	40	33.33%	43.36 $\pm$ 6.11 years
Total	120	100.0%	

**Table 1:** Age and Gender Distribution of the Patients N= 120.

Infection	Frequency/ (%)
Diabetes	13(10.83%)
Hypertension	22(18.33%)
Family history	05(04.16%)
Obesity	06(05.00%)
Dyslipidemia Smoking	08(06.66%)
Alcohol	10(08.33%)
Multiple risk factors	05(04.16%)
	31(25.83%)

**Table 2:** Distribution of Risk Factors of MI N= 120.

Uric acid	Male	Female	P value
Mean $\pm$ SD	6.9 $\pm$ 1.8 mg/dl	5.8 $\pm$ 1.5 mg/dl	0.02

**Table 3:** Distribution of Uric Acid Level According To gender N= 120.

Risk factors of MI	Mean $\pm$ SD
Diabetes	4.9 $\pm$ 1.1 mg/dl
Hypertension	7.1 $\pm$ 1.5 mg/dl
Family history	5.0 $\pm$ 1.3 mg/dl
Obesity	6.1 $\pm$ 1.0 mg/dl
Dyslipidemia Smoking	6.9 $\pm$ 1.2 mg/dl
Alcohol	6.7 $\pm$ 1.3 mg/dl
Multiple risk factors	7.0 $\pm$ 1.6 mg/dl
	7.7 $\pm$ 1.8 mg/dl

**Table 4:** Distribution of Uric Acid Level According Torisk Factors of MI N= 120.

UA concentrations were significantly higher in the male as compare to female P=value 0.02. this difference may because of women were very not found with alcohol consumption and few were smoker, while male were more involve in the smoking and alcohol consumption (Table 3). According to the risk factors of the myocardial infarction high concentration of UA concentration was found in hypertensive  $7.1 \pm 1.5$  mg/dl and those who were noted with multiple risk factors  $7.7 \pm 1.8$  mg/dl, following by Diabetes, obesity, dyslipidemia, smoking and Alcohol as:  $6.1 \pm 1.0$  mg/dl,  $6.9 \pm 1.2$  mg/dl,  $6.7 \pm 1.3$  mg/dl and  $7.0 \pm 1.6$  mg/dl respectively. While in the diabetes and family history cases uric acid was found with normal levels (Table 4).

## Discussion

Raised UA concentration are regularly connected with risks of CVD specially hypertension [10]. Many studies have demonstrated that UA concentration is a vital danger variable for cardiovascular disease [11]. A few studies demonstrated an autonomous relationship between UA and CAD [12,13]. Yet in others, the affiliations misplaced after alteration for confounders. GRACE trial demonstrated that AMI patients in developing nations with age ranges from 55 to 65 years, that's lower than developed world (65-68 years). This distinction might be a result of various ecological, psychosocial elements and hereditary phenomena of various groups of world [14]. Male are the more affected by myocardial infarction, as well as we found mean age of the cases was  $43.36 \pm 6.11$  years, males were found in the majority 66.67% as compare to female 33.33%. Similarly, Burki et al. [15] reported that mean age of the patients was  $51.8 \pm 10.1$  years and 70% were male, and 30% were female in MI group. Alderman et al. [16] demonstrated that men were (61%) and women were (39%). Male gender is the vital danger variable for IHD particularly at a younger age. The lifetime danger of CAD is one in three for female, and a risk of throughout life of developing CAD at 40 years old is 50% to male and 33% for female [16]. CAD is fundamentally low in premenopausal female due to oestrogen [17-20]. Family history is the very important risk for premature CAD development. In this study majority of the cases were found with hypertension 22(18.33%) and multiple risk factors 31(25.83%), followed by diabetes, Family history, obesity, dyslipidemia, smoking and alcohol, with percentage of 13(10.83%), 05(04.16%), 06(05.00%), 08(06.66%), 10(08.33%) and 05(04.16%) respectively. Faisal et al. [20] demonstrated that 32% of cases were with family history of CAD, other hand Akhtar et al. [18] indicated 57% cases were noted with positive family history. Over portion of young Pakistani men with IHD are smokers.18 The investigations of Akhtar et al. [18] and Pais et al. [19] led in Pakistan and India separately have indicated high rate of their patients to be smokers 42.8% and 55% individually. Faisal et al. [20] stated 22% hypertensive case in his study. Though the study directed by Akhtar et al. [18] in cases of IHD 47.6% of their patients to be hypertensive. Faisal et al. [20] observed 28% diabetic cases. Gandapur et al. [21] mentioned that 14% diabetic cases in the study. Dyslipidemia is very important and modifiable IHD elements. Akhtar et al. [18] found in 63.2% of cases dyslipidemia. The comparable results were accounted for by Gandapur et al. [21]. The purpose behind expanded commonness of dyslipidemia is not known, however hereditary and dietary propensities appear to be imperative. Weight reduction is connected with ideal alteration in lipid profile and BP and consequently decreases the danger of IHD. Faisal et al. [20] reported 17% of patients were obese. In this study UA concentration was significantly higher in the male as compared to female P=value 0.02. Fan et al. [22] mentioned that UA in male and female hypertensive was  $5.85 \pm 1.34$  mg/dl and  $4.46 \pm 1.20$  mg/dl respectively.

This difference may be because a very negligible number of women were found to be alcoholic and few were smokers, while males were more involved in the smoking and alcohol consumption. Comparable results were found by Ioachimescu et al. [23] indicated critical relationship between UA concentration and mortality hazard in both genders. In this study according to the risk factors of the myocardial infarction high concentration of UA found in hypertensive  $7.1 \pm 1.5$  mg/dl and those who were noted with multiple risk factors  $7.7 \pm 1.8$  mg/dl, followed by Diabetes, obesity, dyslipidemia, smoking and Alcohol as:  $6.1 \pm 1.0$  mg/dl,  $6.9 \pm 1.2$  mg/dl,  $6.7 \pm 1.3$  mg/dl and  $7.0 \pm 1.6$  mg/dl respectively. While in the diabetes and family history cases uric acid was found with normal levels. Our results are comparable with the study by Alderman et al. [16] which was done on an expansive multiracial populace with crucial hypertension, and observed that UA level and consequent CVD are related, besides showed that likewise CVD risk was preferred anticipated by in-treatment over by pretreatment of UA. Additionally Burki et al. [15] stated that UA concentration is higher in hypertensive cases having MI than in hypertensive cases without MI and raised UA concentration was a danger component of MI.

## Conclusion

It was concluded that raised UA concentration is highly associated with different risk factor of acute MI. From this inference uric acid level should be monitored in all risk factors especially in hypertension and multiple risk factors. Very short data in this country regarding uric acid level and risk factors of MI, therefore more studies are required to be to find out, because due to control serum uric acid levels we can reduce the risk of MI.

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