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FREQUENCY OF HYPERURICEMIA IN THE PATIENTS WITH ACUTE MYOCARDIAL INFARCTION.

Samreen Zafar Memon[1], Shahid Hussain Memon[2], Shazia Kazi[3], Zain Islam Arain[4], Abdul Ghaffar Memon[5], Syed Fasih Ahmed Hashmi[6]

1. MBBS
Post Clinical Fellow
Department of Accident and Emergency
Liaquat University of Medical & Health Sciences
Hyderabad, Sindh, Pakistan.
2. MBBS, FCPS
Assistant Professor
Department of Cardiology
Liaquat University of Medical & Health Sciences
Hyderabad, Sindh, Pakistan.
3. MBBS, FCPS (Cardiology)
Assistant Professor
Department of Cardiology
Isra University Hospital Hyderabad.
4. MBBS, Dipcard
Postgraduate Student (MD Cardiology)
Department of Cardiology
Liaquat University of Medical & Health Sciences
Hyderabad, Sindh, Pakistan.
5. MBBS, FCPS (Cardiology)
Professor and Head
Department of Cardiology
Liaquat University of Medical & Health Sciences
Hyderabad, Sindh, Pakistan.
6. MBBS, FCPS (Cardiology)
Professor
Department of Cardiology
Liaquat University of Medical & Health Sciences
Hyderabad, Sindh, Pakistan.

Correspondence Address:
Dr. Zain Islam Arain
Department of Cardiology
Liaquat University of Health Sciences, Hyderabad.
dr.zainarain@hotmail.com

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ABSTRACT… Objectives: This study aims to scientifically fill the gap and provide the scientific data regarding frequency of hyperuricemia in the patients with acute myocardial Infarction admitted at Liaquat University of Medical & Health Sciences, Hyderabad. **Study Design:** Prospective descriptive case series. **Setting:** Department of Cardiology, Liaquat University of Medical & Health Sciences, Hyderabad. **Period:** From 7th Feb 2016 to 6th August 2018. **Material and Methods:** Was conducted on either gender having age ≥35 to ≤70 years presented with ST elevation myocardial infarction was included in the study. ECG and laboratory investigations were carried out. Relevant investigation like serum uric acid was sent to laboratory. Final outcome was assessed at the end of 5th day, hyperuricemia was labeled if serum uric acid levels above 6.5 mg/dl. All the information was noted in proforma and analyzed using SPSS version 21.0. **Results:** There were 95 male and 50 female patients. The mean age was 49.57 ± 8.53 years, with range 35 (35 - 70) years. The age of 49 (33.8%) patients was ≤45 years and age of 96 (66.2%) patients was >45 years. 17.9% patients were obese and 50.3% patients were hypertensive. The hyperuricemia was present in 27 (18.6%) patients. Among patients who were found with hyperuricemia, the mean age was 49.41 ± 8.34 years. The results showed that significant association of hyperuricemia was observed with obesity. No significant association of hyperuricemia was observed with gender, age, and hypertension. **Conclusion:** Based on the findings of our study, raised serum uric acid levels are associated with adverse cardiovascular outcome. The prevalence of hyperuricemia is high in a population of patients with acute myocardial infarction.

Key words: Acute Myocardial Infarction, Hyperuricemia, Pakistan.

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INTRODUCTION

When serum uric acid levels increased more than 6.5gm/dl is termed as hyperuricemia and well known published literatures have shown that increased uric acid levels are associated with acute and chronic gouty arthropathy, uric acid urolithiasis, and gouty nephropathy. Two most commonly urate level lowering agents Allopurinol and Febuxostat are widely used worldwide but from the last decade data is concerning regarding the relationship between increased serum uric acid levels and development of hypertension, cardiovascular, and renal diseases.[1,2]

During the century of 1900, increased uric acid levels were observed to be the risk factor for cardiovascular disease and these findings are also observed in recent prospective studies.[3] The proposed pathophysiological mechanisms underlying increasing risk of cardiovascular disease is related to the interaction between the antihypertensive urate lowering drugs also it is hypothesized that patients with cardiovascular disease are also having underlying increased serum uric acid levels which contribute in the development of cardiovascular disease. On the other hands, some data also supports the antioxidant property of uric acid plays protective role against the cardiovascular diseases.[4-7]

Great disparity in data from international literature has led us to conduct this study in a Pakistani population where the burden of cardiovascular disease is continuously is on rise besides other conventional risk factors.[8,9] That is why this study has been conducted to determine the significance of raised serum uric acid (SUA) levels in patients presented with acute ST Segment elevation myocardial infarction to tertiary care hospital at Hyderabad.

PATIENTS AND METHODS

All diagnosed patients including both genders and having age ≥35 to ≤70 years presented with ST segment elevation myocardial infarction. All the enrolled patients were informed in detail regarding the study and consent was also taken from them and hospital ethical committee. Patients below age of 35 years or above 70 years, history of bleeding disorders, Diabetic mellitus, Chronic kidney disease, History of gout, and Patients on drugs which increase serum uric acid e.g. salicylates (>2 gm/d), diuretics, ethambutol, pyrazinamide etc, and chronic alcoholics were excluded from this study. The study was conducted in the Department of Cardiology, Liaquat University of Medical & Health Sciences, Hyderabad for duration from 7th Feb 2016 to 6th August 2018.

Detail history was taken regarding age, chest pain, and duration of chest pain. ECG and all required laboratory investigations were carried out. Relevant investigation like serum uric acid was sent to laboratory at admission.

DATA COLLECTION AND ANALYSIS

Structured questionnaire was used for data collection & analysis by using SPSS version 21.0 Statistical Package for the Social Science (SPSS) software, Version 21. Continuous variables like age were analyzed as Mean and Standard Deviation. Quantitative variables like gender and risk factors were presented as frequency and percentages. Effect modifier like gender, age, obesity and hypertension were controlled through stratification. Post stratification chi- squire test was applied by taking p-value ≤0.05 as a significant.

RESULTS

Total 145 patients were included in the study in which frequency of males was higher than females, 95 male and 50 females, respectively. The mean age was 49.57 ± 8.53 years, with range 35 (35–70) years. Study participants were divided into two major age groups (Age ≤45 years and >45 years). Most of the patients in our study were having age more than 45 years (N = 96, 66.2%).

The Comorbids were observed individually among total study subjects. The results showed that 17.9% patients were obese and 50.3% patients were hypertensive. The final outcome i.e. hyperuricemia was evaluated and was found that hyperuricemia was present in 27 (18.6%) patients.

The mean age according to hyperuricemia was also calculated. Among patients who were found with hyperuricemia, the mean age was 49.41±8.34 with range 32(35–67). The mean age was 49.60 ± 8.61 with range 35 (35–70) among those patients who were not found with hyperuricemia.

Stratification with respect to gender, age, obesity, and hypertension was done to observe effect of these modifiers. Post stratification Chi-square test was applied and p-value ≤0.05 was considered as significant. No significant association of hyperuricemia was observed with age, gender, and hypertension (p >0.05). While significant association of hyperuricemia was observed with obesity (p - 0.021). The detailed results are presented in Table-I,II,III & IV.

DISCUSSION

Besides other conventional modifiable and non-modifiable risk factors for cardiovascular disease, raised serum uric acid levels are also a major contributor in the development of coronary artery disease through endothelial dysfunction and platelet aggregation. Some of the studies also observed adverse outcome in patients with raised serum uric acid level.[10,11]

		Hyperuricemia		Total	P-Value
		Yes (n=27)	No (n=118)		
Gender	Male (n=95)	19	76	95	0.556**
	Female (n=50)	8	42	50	
Total		27	118	145	

Table-I. Frequency and association of hyperuricemia according to gender (n=145)

		Hyperuricemia		Total	P-Value
		Yes (n=27)	No (n=118)		
Age Groups	≤ 45 years (n=49)	9	40	49	0.955**
	> 45 years (n=96)	18	78	96	
Total		27	118	145	

Table-II. Frequency and association of hyperuricemia according to age group (n=145)

		Hyperuricemia		Total	P-Value
		Yes (n=27)	No (n=118)		
Obesity	Yes (n=26)	9	17	26	0.021*
	No (n=119)	18	101	119	
Total		27	118	145	

Table-III. Frequency and association of hyperuricemia according to obesity (n = 145)

		Hyperuricemia		Total	P-Value
		Yes (n=27)	No (n=118)		
Hypertension	Yes (n=73)	13	60	73	0.800**
	No (n=72)	14	58	72	
Total		27	118	145	

Table-IV. Frequency and association of hyperuricemia according to hypertension (n = 145)

In our study, more than 18% of patients had hyperuricemia and more than 70% were males. While there are certain studies which shows relatively higher prevalence of hyperuricemia (42.9%) as compared to our study.[12,13] These variations could be due to lower number of patients enrolled in their study or dietary habits differ from us. On the other hands, two different studies have shown higher serum uric acid levels in patients with acute myocardial infarction which was independently associated irrespective of age or gender.

A multicentre study has been conducted at China[14,15] which has shown that those patients who had increased uric acid levels are more likely to have major adverse cardiovascular effects such as heart failure, cardiogenic shock, acute renal failure, and deaths as compared to those who has normal uric acid levels ($p<0.05$). Another study conducted on Japanese patients who were admitted with acute myocardial infarction had poor short term (48 hours) outcome.

Besides international data, a study which has conducted on Indian[13] population also showed similar results. But, Framingham Heart Study did not showed any significance when comparing the data with raised serum uric acid levels and coronary artery disease even after adjustments with gender.

Larger scaled cohort was enrolled in which increased uric acid levels were compared with cardiovascular events. The results of this study were shown that raised uric acid levels had direct and independent relation with coronary artery disease in women.

CONCLUSION

Considering the growing incidence of coronary artery disease, obesity and hypertension can be

associated with hyperuricemia and cardiovascular diseases. Hyperuricemia is common and easily detected and bears association with cardiovascular diseases. Based on the findings of our study, we have observed that uric acid levels when elevated it causes adverse cardiovascular outcome. This study showed that the prevalence of hyperuricemia is high in a population of patients with acute myocardial infarction. However, clinical practice still needs further clinical trials.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Samreen Zafar Memon	All authors have contributed equally	
2	Shahid Hussain Memon		
3	Shazia Kazi		
4	Zain Islam Arain		
5	Abdul Ghaffar Memon		
6	Syed Fasih Ahmed Hashmi		