

Serum uric acid level and its clinical outcome in patients with Acute ST elevation Myocardial Infarction

Asmita Vinubhai Rathod¹, Sureshkumar Madhubhai Nagocha², Ashok Gagia³, Ankur Sumantrai Patel⁴, Henil Kaushikbhai Shah⁵

¹Second Year Resident Doctor, SMIMER Medical College Surat, India.

²Fourth Year Resident, SMIMER, Surat, India.

³Professor, Department of Medicine, SMIMER, Surat, India

⁴Associate Professor, Department of Medicine, SMIMER, Surat, India.

⁵First Year Resident, SMIMER Medical College Surat, India.

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Abstract

Background: Cardiovascular disorders account for almost one-third of all fatalities globally. Ischemic heart disease (IHD) is the most common cardiovascular disease. It is debatable if uric acid has a predictive or risk factor function in cardiovascular disease. Numerous studies have suggested that uric acid may indicate a poor prognosis for patients with acute myocardial infarction, however some study has found no connection between serum uric acid levels and fatality rates. Several studies have revealed a potential relationship between high blood uric acid levels and prognosis in individuals with acute coronary syndromes. Current study was conducted to determine serum uric acid level and its clinical outcome in patients with acute ST elevation Myocardial Infarction. **Methodology:** The study was conducted at a tertiary care hospital for period of 18 months. The sample size taken for this study was 54 patients, who were diagnosed with acute ST elevation myocardial infarction, fulfilling the inclusion and exclusion criteria. Blood samples were obtained. Uric acid and other biochemical parameters were measured. **Result:** Patients age and BMI does not associate with s. uric acid level. There was no association between S. uric acid level and history of hypertension, Diabetes. Patients history of coronary artery disease is not significantly associated with s. uric acid level of patients. Conclusion- Blood uric acid levels have a predictive role in acute STEMI patients.

Keywords: IHD, uric acid, outcome, STEMI, cardiovascular.

Corresponding Author: Dr Ankur Sumantrai Patel, Associate Professor, Department of Medicine, SMIMER Medical College, Surat, India.

Address: 73, Saurabh society, Near Saurabh police Chowki, L. P. Savani Road, Pal, Surat, Gujarat. 395009, India.

Email: drankupatel@gmail.com

Introduction

IHD, also known as coronary artery disease (CAD) and atherosclerotic cardiovascular disease (ACD), causes myocardial infarction and ischemic cardiomyopathy. Atherosclerosis, an inflammatory disease of the arteries coupled with lipid accumulation and metabolic changes caused by many risk factors, is the fundamental pathological process that leads to IHD.¹ According to the Murray et al. Study, there were 9.1 million deaths from the same causes in developing countries versus 5.2 million deaths from cardiovascular illnesses in economically developed nations in 1990.² Some biomarkers in patients with acute myocardial infarction

indicate a poor prognosis. One of the markers that has been studied in Omidvar et al. study is uric acid. It is debatable if uric acid has a predictive or risk factor function in cardiovascular disease. The result of purine metabolism is uric acid, which is created by the enzyme xanthine oxidase. In this mechanism, xanthine oxidase creates oxidants that could play a part in cardiovascular disease. Uric acid can contribute to endothelial damage and an increase in vasoconstrictor effects by causing intracellular stress and inflammation. Numerous studies have suggested that uric acid may indicate a poor prognosis for patients with acute myocardial infarction, however some study has found no connection between serum uric acid levels and fatality rates. The relationship between uric acid levels, xanthine oxidoreductase, and cardiovascular disease is becoming more and more popular. According to earlier research, a high uric acid level is a reliable indicator of a poor prognosis for cardiovascular disease and moderate to severe heart failure.³ Heart failure may cause high uric acid levels, which offer valuable prognostic data. Acute MI-related heart failure can result in tissue hypo-perfusion and hypoxia, which activate xanthine oxidase and cause oxidative stress. A vicious cycle between xanthine oxidase and oxidative stress, as shown by uric acid levels, may encourage serious heart failure.⁴

The significance of uric acid as a risk factor or risk marker for cardiovascular disease is still up for debate, several studies have revealed a potential relationship between high blood uric acid levels and prognosis in individuals with acute coronary syndromes. Cell culture and animal models have been used to investigate the issue. It appears that uric acid must enter both vascular smooth muscle cells and endothelial cells through a particular organic anion exchanger. Once within the cells, it triggers intracellular signaling molecules that in turn trigger inflammation and cell growth. Uric acid suppresses endothelial proliferation and lowers nitric oxide levels in endothelial cells, whereas it stimulates inflammatory and proliferative pathways in vascular smooth muscle cell.⁵

Therefore, the above study was conducted to determine serum uric acid level and its clinical outcome in patients with acute ST elevation Myocardial Infarction.

Methodology

Study place- The above study was conducted at a tertiary care hospital for period of 18 months.

Study design- Cross-sectional analytic study.

Inclusion criteria- Patients with Acute ST elevation myocardial infarction having symptoms of myocardial ischemia in association with significant ST segment elevation on ECG and elevated cardiac biomarker [Troponin T/I and /or CPK MB], age more than 18 years, belonging to both the genders and willing to give informed written consent for the study.

Exclusion criteria- Patients having chronic kidney disease, gout, Hematological malignancy myeloproliferative disorder, lympho proliferative disorder, Hypothyroidism, chronic alcoholism, those with intake like Diuretics, Ethambutol, Pyrazinamide, unwilling to give informed written consent.

Sample size- 54 patients were taken into consideration for the study.

Data analysis- The data was entered in MS-Excel once it was collected and then exported to IBM-SPSS Version 25.0 for analysis. p value of 0.05 was used to determine if there was a statistically significant relationship between the groups.

Ethical considerations-All the necessary permissions were taken from the Institutional Ethics committee before beginning the study.

The socio-demographic profile of the patient, his or her clinical presentation at the time of admission, and their medical history were all gathered .Blood samples were obtained immediately after admission. Uric acid and other biochemical parameters were

measured. Parsazmun photometric kits to measure uric acid. Serum creatinine and uric acid concentrations were expressed as milligrams per deciliter (mg/dl). Normal levels of uric acid were defined 2.5–5.6 mg/dl in women and 3.1– 7 mg/dl in men according to reference laboratory. Patients were divided into four groups according to their serum uric acid level and gender.

Group A1 (male patients with <7 mg/dl): Male patients with serum uric acid level of 7 mg/dl or less.

Group B1 (male patients with ≥ 7 mg/dl): Male patients with serum uric acid level more than 7 mg/dl.

Group A2 (female patients with <5.6 mg/dl): Female patients with serum uric acid level of 5.6 mg/dl or less.

Group B2 (female patients with ≥ 5.6 mg/dl): Female patients with serum uric acid level more than 5.6 mg/dl.

Data was entered in the Microsoft excel spreadsheet and analyzed for further results.

Results

Table 1: Age group and gender wise distribution of study participants

Age group		Gender		Total
		Female	Male	
<=30	n	2	2	4
	%	11.10%	5.60%	7.40%
31-40	n	4	7	11
	%	22.20%	19.40%	20.40%
41-50	n	4	10	14
	%	22.20%	27.80%	25.90%
51-60	n	2	11	13
	%	11.10%	30.60%	24.10%
≥ 61	n	6	6	12
	%	33.30%	16.70%	22.20%
Total	n	18	36	54
	%	100.00%	100.00%	100.00%

Among the fifty-four participants, eighteen participants were female, and thirty-six participants were male. Out of fifty-four participants, four patients were fall under less than thirty years and from that two participants (11.10%) were female, and two participants (5.60%) were male. Among eleven participants (20.40%) who were fall under 31-40 age years, four participants (22.20%) were female, and seven participants (19.40%) were male. Out of fourteen patients (25.90%) fall under 41-50 age years, four participants (22.20%) were female, and ten participants (27.80%) were male. Out of thirteen participants (24.10%) who fall under 51-60 age years, two participants (11.10%) were female, and eleven participants (30.60%) were male. Out of twelve participants (22.20%) who fall under greater than 61 age years, six participants (33.30%) were female, and six participants (16.70%) were male.

Table 2: Distribution of Group A1 (male patients with normal serum uric acid level <7 mg/dl) and Group B1 (male patients with higher serum uric acid 7 mg/dl) study participants according to their hypertension status

HTN		Group		Total
		A1	B1	
Present	N	20	10	30
	%	83.3%	83.3%	83.3%
Absent	N	4	2	6
	%	16.7%	16.7%	16.7%
Total	N	24	12	36
	%	100.0%	100.0%	100.0%
Chi Square value 0.009		p value: 1		

Out of thirty-six participants, thirty participants were suffering from hypertension and only six participants were not suffering from hypertension. Out of thirty participants who were suffering from hypertension, twenty participants (83.3%) were from A1 (male patients with <7 mg/dl) group and ten participants (83.3%) were from B1 (male patients with \geq 7 mg/dl) group. Out of Six participants (16.7%) who were not suffering from hypertension, four participants (16.7%) were from A1 (male patients with <7 mg/dl) group and two participants (16.7%) were from B1 (male patients with \geq 7 mg/dl). Here p value > 0.05 so there was not an association between groups and hypertension.

Table 3: Distribution of Group A1 (male patients with normal serum uric acid level <7 mg/dl) and B1 (male patients with higher serum uric acid level \geq mg/dl) study participants according to their Diabetes status

DM		Group		Total
		A1	B1	
Present	N	20	11	31
	%	83.3%	91.7%	86.1%
Absent	N	4	1	5
	%	16.7%	8.3%	13.9%
Total	N	24	12	36
	%	100.0%	100.0%	100.0%
Chi Square value 0.465		p value: 0.496		

Out of thirty-one participants (86.1%) who were suffering from diabetes, majority twenty participants (83.3%) were from A1 (male patients with <7 mg/dl). Out of five participants (13.9%) who were not suffering from diabetes, majority four participants (16.7%) who were from A1 (male patients with <7 mg/dl) group. Here p value > 0.05 so there was not an association between groups and Diabetes.

Table 4: Distribution of Group A1 (male patients with normal serum uric acid level <7 mg/dl) and B1 (male patients with higher serum uric acid level 7 mg/dl) study participants according to history of coronary artery disease

CAD		Group		Total
		A1	B1	
Present	N	14	7	21
	%	58.3%	58.3%	58.3%
Absent	N	10	5	15
	%	41.7%	41.7%	41.7%

Total	N	24	12	36
	%	100.0%	100.0%	100.0%
Chi Square value 0.000		p value: 1		

Out of twenty-one participants (58.3%) who have coronary artery disease, majority fourteen participants (58.3%) were from group A1 (male patients with <7 mg/dl). Out of fifteen participants (41.7%) who have not coronary artery disease, Majority ten participants (41.7%) were from group A1 (male patients with <7 mg/dl). Here p value > 0.05 so there was not an association between groups and coronary artery disease.

Table 5: Distribution of Group A1 (male patients with normal serum uric acid level<7 mg/dl) and B1 (male patients with higher serum uric acid level \geq 7 mg/dl) study participants according to history of CABG

DM		Group		Total
		A1	B1	
Present	N	3	1	4
	%	12.5%	8.3%	11.1%
Absent	N	21	11	32
	%	87.5%	91.7%	88.9%
Total	N	24	12	36
	%	100.0%	100.0%	100.0%
Chi Square value 0.141		p value: 0.708		

Out of four participants (12.5%) who have CABG, majority three participants (12.5%) were from group A1 (male patients with <7 mg/dl). Out of thirty-two participants (88.9%) who have not CABG, Majority twenty-one participants (87.5%) were from group A1 (male patients with <7 mg/dl). Here p value > 0.05 so there was not an association between groups and CABG.

Table 6: Distribution of Group A1 (male patients with normal serum uric acid level<7 mg/dl) and B1 (male patients with higher serum uric acid level \geq 7 mg/dl) study participants according to site of myocardial infarction

MI site		Group		Total
		A1	B1	
Anterior	N	13	7	20
	%	54.2%	58.3%	55.6%
Inferior	N	11	5	16
	%	45.8%	41.7%	44.4%
Total	N	24	12	36
	%	100.0%	100.0%	100.0%
Chi Square value 0.059		p value: 0.813		

Out of twenty participants (55.6%) who have anterior myocardial infarction, majority thirteen participants (54.2%) were from group A1 (male patients with <7 mg/dl). Out of sixteen participants (44.4%) who have inferior myocardial infarction, Majority eleven participants (45.8%) were from group A1 (male patients with <7 mg/dl). Here p value > 0.05 so there was not an association between groups and site of myocardial infarction.

Table 7: Distribution of Group A1 (male patients with normal serum uric acid level <7 mg/dl) and B1 (male patients with higher serum uric acid level \geq 7 mg/dl) study participants according to their outcome

Outcome		Group		Total
		A1	B1	
Survived	N	23	7	30
	%	95.8%	58.3%	83.3%
Died	N	1	5	6
	%	4.2%	41.7%	16.7%
Total	N	24	12	36
	%	100.0%	100.0%	100.0%
Chi Square value 8.1		p value: 0.004*		

Out of thirty-six participants, outcome of thirty participants (83.3%) was survived and six participants (16.7%) was died. Out of thirty participants (83.3%) whose outcome was survived, twenty-three participants (95.8%) were from group A1 (male patients with <7 mg/dl). Out of six participants (16.7%) whose outcome was died, five participants (41.7%) were from group B1 (male patients with \geq 7 mg/dl). Here p value < 0.05 so there was an association between groups and outcome.

Table 8: comparison of mean variables between Group A1 (male patients with normal serum uric acid level <7 mg/dl) and Group B1 (male patients with higher serum uric acid \geq 7 mg/dl)

Group		Mean	Std. Deviation	t value	p value
Age	A1	47.00	12.11	-1.90	0.07
	B1	54.75	10.29		
BMI	A1	27.50	0.52	-10.88	0.00*
	B1	29.50	0.52		
S. creatinine	A1	1.07	0.23	-1.23	0.23
	B1	1.17	0.23		
S. Uric acid	A1	5.07	1.24	-7.49	0.00*
	B1	8.47	1.37		
LVEF	A1	42.65	8.73	0.62	0.54
	B1	40.65	9.73		
Duration of hospital stay	A1	7.21	4.10	-0.27	0.79
	B1	7.57	2.66		

Mean age of group B1 (male patients with \geq 7 mg/dl) was more than group A1 (male patients with <7 mg/dl). The p value > 0.05 so there was not an association between age of group A1 (male patients with <7 mg/dl) and group B1 (male patients with \geq 7 mg/dl). The mean BMI of group B1 (male patients with \geq 7 mg/dl) was more than group A1 (male patients with <7 mg/dl). Here the p value < 0.05 so there was association between BMI of group A1 (male patients with <7 mg/dl) and group B1 (male patients with \geq 7 mg/dl). The mean S. creatinine of group B1 (male patients with \geq 7 mg/dl) was more than group A1 (male patients with <7 mg/dl). Here the p value > 0.05 so there was no association between S. creatinine of group A1 (male patients with <7 mg/dl) and group B1 (male patients with \geq 7 mg/dl). The mean S. uric acid of group B1 (male patients with \geq 7 mg/dl) was more than group A1 (male patients

with <7 mg/dl). Here the p value < 0.05 so there was association between S. Uric acid of group A1 (male patients with <7 mg/dl) and group B1 (male patients with ≥ 7 mg/dl). The mean LVEF of group A1 (male patients with <7 mg/dl) was more than group B1 (male patients with ≥ 7 mg/dl). Here the p value > 0.05 so there was no association between LVEF of group A1 (male patients with <7 mg/dl) and group B1 (male patients with ≥ 7 mg/dl). The mean duration of hospital stay of group B1 (male patients with ≥ 7 mg/dl) was more than group A1 (male patients with <7 mg/dl). Here the p value > 0.05 so there was no association between duration of hospital stay of group A1 (male patients with <7 mg/dl) and group B1 (male patients with ≥ 7 mg/dl).

Table 9: Distribution of Group A2 (female patients with normal serum uric acid level <5.6 mg/dl) and B2 (female patients with higher serum uric acid level ≥ 5.6 mg/dl) study participants according to their hypertension status

HTN		Group		Total
		A2	B2	
Present	N	5	4	9
	%	50.0%	50.0%	50.0%
Absent	N	5	4	9
	%	50.0%	50.0%	50.0%
Total	N	10	8	18
	%	100.0%	100.0%	100.0%
Chi Square value 0.009		p value: 1		

Out of eighteen participants, nine participants (50.0%) were suffering from hypertension and nine participants (50.0%) were not suffering from hypertension. Out of nine participants who were suffering from hypertension, five participants (50.0%) were from group A2. Among nine participants who were not suffering from hypertension, five participants (50.0%) were from group A2. Here p value > 0.05 so there was not an association between groups and site of hypertension.

Table 10: Distribution of Group A2 (female patients with normal serum uric acid level <5.6 mg/dl) and B2 (female patients with higher serum uric acid level ≥ 5.6 mg/dl) study participants according to their Diabetes status

DM		Group		Total
		A2	B2	
Present	N	7	6	13
	%	70.0%	75.0%	72.2%
Absent	N	3	2	5
	%	30.0%	25.0%	27.8%
Total	N	10	8	18
	%	100.0%	100.0%	100.0%
Chi Square value 0.055		p value: 0.814		

Out of eighteen participants, thirteen participants (72.2%) were suffering from diabetes and five participants (27.8%) were not suffering from diabetes. Out of thirteen participants who were suffering from diabetes, seven participants (70.0%) were from group A2. Among five participants who were not suffering from diabetes, three participants (30.0%) were from group A2. Here p value > 0.05 so there was not an association between groups and Diabetes.

Table 11: Distribution of Group A2 (female patients with normal serum uric acid level <5.6 mg/dl) and B2 (female patients with higher serum uric acid level \geq 5.6 mg/dl) study participants according to history of coronary artery disease

CAD		Group		Total
		A2	B2	
Present	N	3	3	6
	%	30.0%	37.5%	33.3%
Absent	N	7	5	12
	%	70.0%	62.5%	66.7%
Total	N	10	8	18
	%	100.0%	100.0%	100.0%
Chi Square value 0.113		p value: 0.737		

Among of eighteen participants who were suffering from coronary artery disease, three participants (30.0%) were from group A2 (female patients with <5.6 mg/dl) and three participants (37.5%) were from group B2. Twelve participants (66.7%) who were not suffering from coronary artery disease, seven participants (70.0%) were from group A2 (female patients with <5.6 mg/dl) and five participants (62.5%) were from group B2. Here p value > 0.05 so there was not an association between groups and coronary artery disease.

Table 12: Distribution of Group A2 (female patients with normal serum uric acid level <5.6 mg/dl) and B2 (female patients with higher serum uric acid level \geq 5.6 mg/dl) study participants according to history of CABG

CABG		Group		Total
		A2	B2	
Present	N	1	2	3
	%	10.0%	25.0%	16.7%
Absent	N	9	6	15
	%	90.0%	75.0%	83.3%
Total	N	10	8	18
	%	100.0%	100.0%	100.0%
Chi Square value 0.720		p value: 0.396		

Out of three participants, who were suffering from CABG, two participants (25.0%) were from group B2 (female patients with \geq 5.6 mg/dl) and fifteen participants (83.3%) who were not suffering from CABG, nine participants (90.0%) were from group A2. Here p value > 0.05 so there was not an association between groups and CABG.

Table 13: Distribution of Group A2 (female patients with normal serum uric acid level <5.6 mg/dl) and B2 (female patients with higher serum uric acid level \geq 5.6 mg/dl) study participants according to history of percutaneous coronary intervention

Percutaneous coronary intervention		Group		Total
		A2	B2	
Present	N	1	3	4
	%	10.0%	37.5%	22.2%
Absent	N	9	5	14
	%	90.0%	62.5%	77.8%
Total	N	10	8	18

	%	100.0%	100.0%	100.0%
Chi Square value 1.94		p value: 0.163		

From the above table it can be interpreted that Out of four participants, who were suffering from percutaneous coronary intervention, three participants (37.5%) were from group B2 (female patients with ≥ 5.6 mg/dl) and fourteen participants (77.8%) who were not suffering from percutaneous coronary intervention, nine participants (90.0%) were from group A2. Here p value > 0.05 so there was not an association between groups and percutaneous coronary intervention.

Table 14: Distribution of Group A2 (female patients with normal serum uric acid level < 5.6 mg/dl) and B2 (female patients with higher serum uric acid level ≥ 5.6 mg/dl) study participants according to site of myocardial infarction

MI site		Group		Total
		A2	B2	
Anterior	N	6	5	11
	%	60.0%	62.5%	61.1%
Inferior	N	4	3	7
	%	40.0%	37.5%	38.9%
Total	N	10	8	18
	%	100.0%	100.0%	100.0%
Chi Square value 0.012		p value: 0.914		

Out of eleven participants, who were suffering from anterior myocardial infarction, six participants (60.0%) were from group A2 (female patients with < 5.6 mg/dl) and seven participants (38.9%) who were suffering inferior myocardial infarction, four participants (40.0%) were from group A2. Here p value > 0.05 so there was not an association between groups and site of myocardial infarction.

Table 15: Distribution of Group A2 (female patients with normal serum uric acid level < 5.6 mg/dl) and B2 (female patients with higher serum uric acid level ≥ 5.6 mg/dl) study participants according to their outcome

Outcome		Group		Total
		A2	B2	
Survived	N	10	6	16
	%	100.0%	75.0%	88.9%
Died	N	0	2	2
	%	0.0%	25.0%	11.1%
Total	N	10	8	18
	%	100.0%	100.0%	100.0%
Chi Square value 2.81		p value: 0.09		

From the above table it can be interpreted that Out of sixteen participants whose outcome was survived, ten participants (100.0%) were from group A2. Out of two participants (11.1%) whose outcome was died, two participants (25.0%) were from group B2. Here p value > 0.05 so there was not an association between groups and outcome.

Discussion

In our study it can be interpreted that among the fifty-four participants, eighteen participants were female and thirty-six participants were male. Out of fifty-four participants, four patients were fall under less than thirty years and from that two participants (11.10%) were female and two participants (5.60%) were male. Among eleven participants (20.40%) who were fall under 31-40 age years, four participants (22.20%) were female and seven participants (19.40%) were male. Out of fourteen patients (25.90%) fall under 41-50 age years, four participants (22.20%) were female and ten participants (27.80%) were male. Out of thirteen participants (24.10%) who fall under 51-60 age years, two participants (11.10%) were female and eleven participants (30.60%) were male. Out of twelve participants (22.20%) who fall under greater than 61 age years, six participants (33.30%) were female and six participants (16.70%) were male. As per Li Chen, Xian-lun Li et al study mean age was patients with hyperuricemia 61.51 and SD 14.01 while patients with non-hyperuricemia mean age was 61.19 and SD 14.06 comparison of both group shows p value 0.83 which was statically not significant.⁶

According to Ranjith et al study in female patients with normal serum uric acid was 685 (37%). while female patients with hyperuricemia was 258(37%), while male patients with normal serum uric acid was 1308 (66%). While male patients with hyperuricemia was 432(63%).⁷ As per Li Chen, Xian-lun Li et al study male patients contributed were 82 (68.9%) with hyperuricemia while patients with non-hyperuricemia male patients were contribute 335 (87.9%) comparison of both group shows p value < 0.001 which was statically significant. Furthermore, in male patients with normal serum uric acid out of 1308 PCI was seen in 141(23%) of female patients. While male patients with hyperuricemia out of 432 PCI was seen in 53 (26%) of female patients. Comparison of female and male group shows p value 0.432 which was non-significant.⁶ As per Ranjith et al study the subjects average age ranged from 57.1 to 11.5 years, with 79% having ST elevation myocardial infarction (STEMI) and 21% having non-STEMI (NSTEMI).⁷

In our study, out of thirty-six participants, thirty participants were suffering from hypertension and only six participants were not suffering from hypertension. Out of thirty participants who were suffering from hypertension, twenty participants (83.3%) were from A1 (male patients with <7 mg/dl) group and ten participants (83.3%) were from B1 (male patients with \geq 7 mg/dl) group. Out of Six participants (16.7%) who were not suffering from hypertension, four participants (16.7%) were from A1 (male patients with <7 mg/dl) group and two participants (16.7%) were from B1 (male patients with \geq 7 mg/dl). Here p value > 0.05, so there was no association between groups and hypertension. According to Li Chen, Xian-lun Li et al study hypertension was seen in 60(50.4%) with hyperuricemia while patients with non-hyperuricemia hypertension was seen in 197(51.4%) comparison of both group shows p value 0.846 which was statically not significant.⁶

In our study, out of thirty-one participants (86.1%) were suffering from diabetes, majority twenty participants (83.3%) were from A1 (male patients with <7 mg/dl). Out of five participants (13.9%) who were not suffering from diabetes, majority wise four participants (16.7%) who were from A1 (male patients with <7 mg/dl) group. Here p value > 0.05 so there was no association between groups and Diabetes. As per Ranjith et al study overall, 59% of people had a history of diabetic mellitus.⁷

In our study, out of twenty-one participants (58.3%) who have coronary artery disease, majority fourteen participants (58.3%) were from group A1 (male patients with <7 mg/dl). Out of fifteen participants (41.7%) who have not coronary artery disease, majority ten participants (41.7%) were from group A1 (male patients with <7 mg/dl). Here p value > 0.05

so there was not an association between groups and coronary artery disease. As per Ranjith et al study 58% had a family history of early CAD.⁷

In our study it indicates that out of four participants (12.5%) who have CABG, majority three participants (12.5%) were from group A1 (male patients with <7 mg/dl). Out of thirty-two participants (88.9%) who have not CABG, majority twenty-one participants (87.5%) were from group A1 (male patients with <7 mg/dl). Here p value > 0.05 so there was no association between groups and CABG. As per Li Chen, Xian-lun Li et al. study 431 STEMI patients had coronary angiography. Patients with various diseased arteries did not significantly differ in their SUA levels (P>0.05). Patients with one vessel block serum uric acid level mean was 321.94 SD 91.02 while patients with two vessels mean SD was 329.72, 106.71 block, furthermore patients with three vessels block mean SD 330.67, 106.47.

⁶ As per Ranjith et al study in female patients with normal serum uric acid out of 685 CABG was seen in 89(47%) of female patients. while female patients with hyperuricemia out of 258 CABG was seen in 37(65%) of female patients.⁷ Furthermore, in male patients with normal serum uric acid out of 1308 CABG was seen in 312(51%) of female patients. while male patients with hyperuricemia out of 432 CABG was seen in 100 (49%) of female patients. Comparison of female and male group shows p value 0.544 which was non-significant.

In our study out of six participants (16.7%) who have percutaneous coronary intervention, majority five participants (20.8%) were from group A1 (male patients with <7 mg/dl). Out of thirty participants (83.3%) who have not percutaneous coronary intervention, Majority nineteen participants (79.2%) were from group A1 (male patients with <7 mg/dl). Here p value > 0.05 so there was not an association between groups and percutaneous coronary intervention. Furthermore, in male patients with normal serum uric acid out of 1308 PCI was seen in 141(23%) of female patients. while male patients with hyperuricemia out of 432 PCI was seen in 53 (26%) of female patients. Comparison of female and male group shows p value 0.432 which was non-significant.⁸ It can be interpreted that out of twenty participants (55.6%) who have anterior myocardial infarction, majority thirteen participants (54.2%) were from group A1 (male patients with <7 mg/dl). Out of sixteen participants (44.4%) who have inferior myocardial infarction, Majority eleven participants (45.8%) were from group A1 (male patients with <7 mg/dl). Here p value > 0.05 so there was not an association between groups and site of myocardial infarction. According to Kojima et al., the number of fatalities following acute myocardial infarction and uric acid levels were related to Killip categorization. of patients with greater uric acid concentration was around 3.7 times higher than those with lower one.⁹

In our study, out of thirty-six participants, outcome of thirty participants (83.3%) was survived and six participants (16.7%) died. Out of thirty participants (83.3%) whose outcome was survived, twenty-three participants (95.8%) were from group A1 (male patients with <7 mg/dl). Out of six participants (16.7%) whose outcome was died, five participants (41.7%) were from group B1 (male patients with \geq 7 mg/dl). Here p value < 0.05 so there was an association between groups and Outcome. As a result, people with cardiovascular illnesses may be at risk for cardiovascular events and death if they have high uric acid levels. recent times studies have demonstrated that there is a link between uric acid and cardiovascular disease. Patients with high levels of uric acid who had angiographically verified coronary artery disease were five times more likely to pass away than those with lower levels. levels of UA, and each extra mg/dl of uric acid was linked to an additional 26% mortality.

As per Li Chen, Xian-lun Li et al study overall mortality was seen in 15(12.6%) with hyperuricemia while patients with non-hyperuricemia overall mortality was seen in 23(6%)

comparison of both group shows p value 0.017 which was statically significant.

The mean duration of hospital stay in our study group B1 (male patients with ≥ 7 mg/dl) was more than group A1 (male patients with < 7 mg/dl). Here the p value > 0.05 so there was no association between duration of hospital stay of group A1 (male patients with < 7 mg/dl) and group B1 (male patients with ≥ 7 mg/dl). As per Li Chen, Xian-lun Li et al study in both groups, the typical length of stay in the hospital was similar (12.06 ± 5.70 days). Patients with hyperuricemia experienced increased MACE, such as heart failure, cardiogenic shock, stroke, acute renal failure, and death, while in the hospital ($P < 0.05$).⁶

The mean LVEF of group A1 (male patients with < 7 mg/dl) was more than group B1 (male patients with ≥ 7 mg/dl). Here the p value > 0.05 , so there was no association between LVEF of group A1 (male patients with < 7 mg/dl) and group B1 (male patients with ≥ 7 mg/dl). As per Li Chen, Xian-lun Li et al study LVEF in patients with hyperuricemia mean and SD was 54.44 and 12.74 while in patients with non-hyperuricemia serum uric acid level mean and SD was 58.73 and 9.69 comparison of both group shows p value 0.002 which was statically significant.⁶

Conclusion

The findings of our research imply that blood uric acid levels have a predictive role in acute STEMI patients of both sexes dying in hospitals. This may be a helpful indicator for estimating a patient's short-term mortality.

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