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STUDY ON INSULIN RESISTANCE IN NORMAL WEIGHT SERUM URIC ACID PROFILE IN 100 CASES OF STEMI IN A TERITARY CARE HOSPITAL

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ABSTRACT :

Background: Patients with ischemic heart disease fall into two large groups: patients with chronic coronary artery disease (CAD) who most commonly present with stable angina and patients with acute coronary syndromes (ACSs)1,2. The latter group, in turn, is composed of patients with acute myocardial infarction (MI) with ST-segment elevation on their presenting electrocardiogram and those with unstable angina and non-ST-segment elevation MI (UA/NSTEMI)

Methods: Data was collected from patients attending the Department of General Medicine of Sree Mookambika Institute of Medical sciences, kanyakumari, tamil nadu, from march 2023 to september 2024. 100 patients of STEMI who got admitted serially in ICCU. Cases with STEMI who fulfilled the pre-requisites for thrombolysis and thrombolysed with streptokinase, Both failed and successful thromolysed cases were included. Exclusion criteria arePatients with STEMI,Not thrombolysed because of late presentation or patients having contra-indication for streptokinase use,With renal failure,On drugs like diuretics, pyrazinamide.

Results: our study, uni-variate analysis reveals statistically significant association of early complications of STEMI with Hyperuricemia and also with older age(Age>50years),Diabetes mellitus ,Dyslipidemia .

Conclusion: From the cross sectional study of "Serum uric acid in 100 patients with STEMI", conducted at Intensive Coronary Care Unit of mookambika college Hospital, it is concluded that:Mean Serum uric acid level is lower among females than males. Hyperuricemia is statistically significantly associated with older age(Age>50years),

Keywords: ST elevation Myocardial infarction, Non St segment elevation Myocardial infarction, Intensive cardiac care unit.

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INTRODUCTION:

Patients with ischemic heart disease fall into two large groups: patients with chronic coronary artery disease (CAD) who most commonly present with stable angina and patients with acute coronary syndromes (ACSs)1,2. The latter group, in turn, is composed of patients with acute myocardial infarction (MI) with ST-segment elevation on their presenting electrocardiogram and those with unstable angina and non-ST-segment elevation MI (UA/NSTEMI)3,4.

The early (30-day) mortality rate from AMI is ~30%, with more than half of these deaths occurring before the stricken individual reaches the hospital5. Although the mortality rate after admission for AMI has declined by ~30% over the past two decades, approximately 1 of every 25 patients who survives the initial hospitalization dies in the first year after AMI. Mortality is approximately fourfold higher in elderly patients (over age 75) compared with younger patients6,7.

Early Complications of STEMI include Ventricular dysfunction, Cardiogenic shock8,9, Infarction related arrhythmias, thromboembolism , Left ventricular aneurysm10, papillary muscle rupture, ventricular free wall rupture and ventricular septal rupture13,14.

In clinical practice, there are many scoring systems15 based on either clinical features or ECG changes are used for predicting the early complications following STEMI. KILLIP's classification18, TIMI scoring system16,17 and PREDICT scoring system are few among them. There are certain biochemical substances are also found to be elevated in complicated cases of STEMI like HsCRP, NT-BNP19 by various studies. Serum uric acid is one among them which is being under study in acute coronary syndromes as a prognostic predictor 20-25. My study is mainly intended to find whether there is an association between hyperuricemia and early complications of STEMI or not.

AIM AND OBJECTIVES OF THE STUDY:

- To know the prevalence of Hyperuricemia in STEMI patients.
- To know the significance of association of Hyperuricemia with other cardio vascular risk factors.
- To know the association of Hyperuricemia with infarction pattern.
- To know the significance of association of Hyperuricemia with early complications of STEMI.
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MATERIALS AND METHODS:

Data was collected from patients attending the Department of General Medicine of Sree Mookambika Institute of Medical sciences, kanyakumari, tamil nadu, from march 2023 to september 2024. 100 patients of STEMI who got admitted serially in ICCU. Cases with STEMI who fulfilled the pre-requisites for thrombolysis and thrombolysed with streptokinase, Both failed and successful thromolysed cases were included. Exclusion criteria arePatients with STEMI,Not thrombolysed because

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of late presentation or patients having contra-indication for streptokinase use,With renal failure,On drugs like diuretics, pyrazinamide.

This study was approved by the Ethical Committee of our institute. Patients were selected for study according to the inclusion and exclusion criteria, mentioned above . Detailed history regarding smoking,alcoholism, diabetes mellitus, hypertension, Drug intake was enquired. Vital signs, waist/Hip ratio, 15 lead-ECG findings were noted. Blood sugar values, Fasting lipid profile and Fasting Serum uric acid were noted. After thrombolysis patients were followed up till they leave the hospital. During the hospital stay they were closely monitored for development of complications like Heart failure, Cardiogenic shock, Arrhythmias, Thromboembolism and sudden cardiac death.

Statistical analysis was done using the statistical package for social sciences (SPSS).Different statistical methods were used as appropriate. Mean ± SD was determined for quantitative data and frequency for categorical variables. The independent t- test was performed on all continuous variables. The normal distribution data was checked before any t-test. The Chi-Square test was used to analyze group difference for categorical variables. In logistic regression models, age was adjusted for estimation of each or all the independent effects of hypertension, ischemic heart disease and diabetes mellitus . A p- value < 0.05 was considered significant.

RESULTS:

Age > 50 years, Diabetes Mellitus &Central Obesity are the commonest risk factors. Hyperuricemia is present in 30% of study population.

Prevalence of Risk Factors

Sl. No	Risk Factors	No. of Cases	Percentage
1	Age > 50 years	54	54%
2	Smoking	29	29%
3	Alcoholism	21	21%
4	Diabetes Mellitus	51	51%
5	Hyper tension	36	36%
6	Central Obesity	46	46%
7	Dyslipidemia	41	41%
8	Hyperuricemia	30	30%

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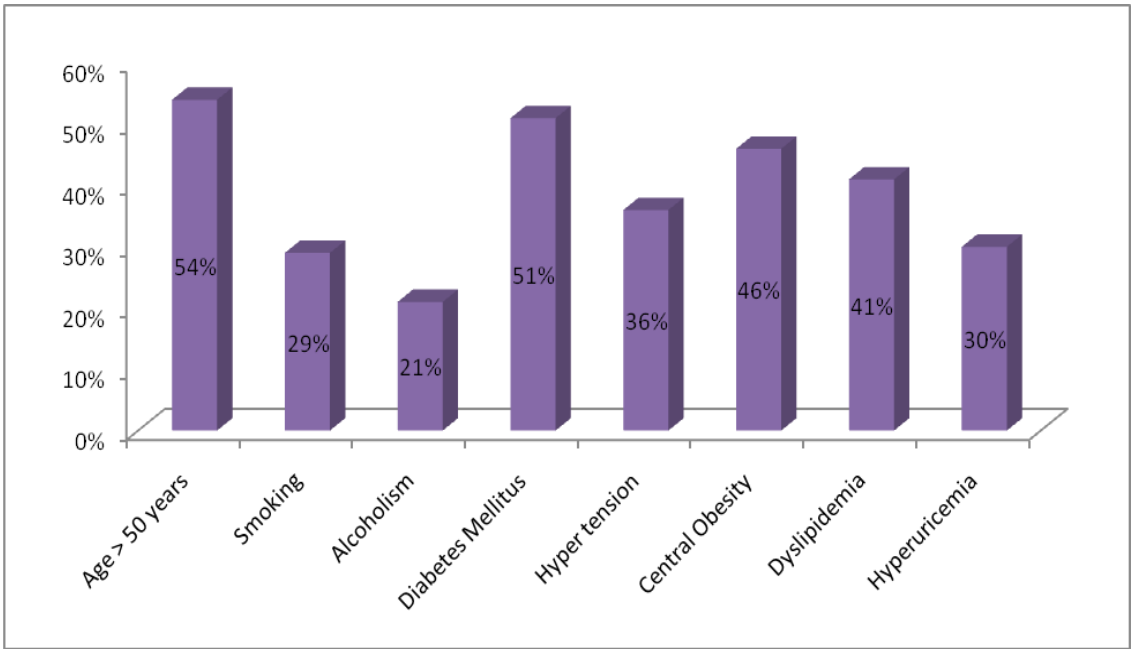

Distribution of Uric acid Values

	Lower Value	Higher Value	Mean	Standard Deviation
Male	2.8	8.1	6.141	1.287
Female	3.0	7.3	4.3	1.4836
Overall	2.8	8.1	5.368	1.6430

Mean Serum uric acid level in females is lower than males.

Association of Individual Risk Factor with Hyperuricemia

Sl. No	Risk Factor	Hyper Uricemia		Risk Ratio	95% Confidence Interval	Chi - Square value	p - Value
		Yes	No				
1	Age > 50yrs	21	33	2.616	1.052 – 6.506	4.417	**0.029***
2	Smoking	10	19	1.342	0.533 – 3.381	0.391	0.346
3	Alcoholism	9	12	2.071	0.764 – 5.620	2.092	0.120
4	Diabetes Mellitus	21	30	3.111	1.248 – 7.753	6.191	**0.011***

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5	Hyper Tension	16	20	2.857	1.179 – 6.923	5.589	**0.017***
6	Central Obesity	15	31	1.258	0.534 – 2.964	0.276	0.379
7	Dyslipidemia	12	29	1.156	0.394 – 2.253	0.018	0.537

Age > 50yrs, Diabetes Mellitus and Hypertension are the statistically significant risk factors associated with Hyperuricemia.

Multivariate analysis of risk factors associated with Hyperuricemia

Variable	Co efficient	Std error	F – test	p – value
Age > 50 years	0.163	0.090	3.312	0.072
Male Sex	0.071	0.115	0.381	0.538
Smoking	-0.014	0.122	0.013	0.908
Alcoholism	0.201	0.120	2.7962	0.097
Diabetes Mellitus	0.260	0.089	8.5396	**0.004***
Hypertension	0.239	0.093	6.655	**0.011***
Central Obesity	0.141	0.098	2.0439	**0.036***
Dyslipidemia	0.031	0.099	0.098	0.753

ANALYSIS OF ASSOCIATION OF MULTIPLE RISK FACTORS& HYPERURICEMIA

No. of Risk Factors	Hyperuricemia		
	Yes	No	Total
5	3	1	4
4	14	9	23
3	12	16	28
2	2	31	33
1	0	11	11

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Total	30	70	100

Multiple Risk Factors & Hyperuricemia

	Hyperuricemia		Risk Ratio	95% Confidence Interval	Chi-square Value	p – Value
	Yes	No				
Diabetes Mellitus	21	30	3.111	1.248 – 7.753	6.191	0.011*
Hyper Tension	16	20	2.857	1.179 – 6.923	5.589	0.017*
Age > 50yrs	21	33	2.616	1.052 – 6.506	4.417	0.029*
All the above factors together	8	5	**4.727**	1.399 –15.97	7.078	0.012*

While multiple risk factors are present in a single patient ,the probability of Hyperuricemia significantly rises .

Association of Hyperuricemia & Infarction Pattern

Type of Infarction	Hyperuricemia		Total
	Yes	No	
Anterior	25	32	57
Inferior	5	38	43
Total	30	70	100

Anterior = Anterolateral, ASMI & Extensive Anterior Wall

Inferior = IWMI, IWMI + PWMI, IWMI + PWMI + RVMI & IWMI + RVMI

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Risk Ratio	95% Confidence Interval	Chisquare Value	p – Value
5.938	2.038 – 17.295	12.125	**0.001***

DISCUSSION:

In our study, male cases constitute 58% and female cases constitute 42%. Older age(age>50 years), Diabetes mellitus and central obesity are common risk factors associated with STEMI. Most of the patients with hyperuricemia are having more than one cardiovascular risk factors. Several studies[21-25] demonstrated possible association of hyperuricemia with other cardiovascular risk factors and also with higher morbidity and mortality from Coronary artery diseases. Few studies[23] fail to reveal significant association between hyperuricemia and cardiovascular diseases. However, our study shows statistically significant association of hyperuricemia with older age (Age>50years), Diabetes mellitus and hypertension through uni-variate analysis of cardiovascular risk factors. Multi-variate analysis reveals statistically significant association of hyperuricemia with Diabetes mellitus ,hypertension and central obesity.

In an Asian study[26] conducted by J. Woo, R. Swaminathan, C. Cockram, E. Lau' and A. Chan2,the association between serum uric acid concentration and some cardiovascular risk factors was examined in a working Hong Kong Chinese population (mean age 38 years), consisting of 910 men and 603 women. Positive associations were found between serum uric acid concentration and body mass index, waist hip ratio,systolic and diastolic blood pressure, urea, creatinine, protein, glucose (fasting and 2 hours after 75 g oralglucose load), 2 hour insulin, triglycerides, and apolipoprotein B in men. In both sexes, serum uric acid was negatively associated with high-density lipoprotein cholesterol.

Moreover in our study, uni-variate analysis reveals statistically significant association of early complications of STEMI with Hyperuricemia and also with older age(Age>50years),Diabetes mellitus ,Dyslipidemia .

A large cross-sectional population-based study of epidemiological follow-up data from the First National Health and Nutrition Examination Survey[27] (NHANES I) from 1971-1975 and data from NHANES I Epidemiologic Follow-up Study (NHEFS) suggested that increased serum uric acid levels are independently and significantly associated with risk of cardiovascular mortality.

Another Asian study, the Japanese Acute Coronary Syndrome Study(JACSS)[28] conducted at Kumamato university also concluded that serum UA level after AMI is a good predictor of mortality in patients who have AMI.

CONCLUSION:

From the cross sectional study of "Serum uric acid in 100 patients with STEMI",

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conducted at Intensive Coronary Care Unit of mookambika college Hospital, it is concluded that:Mean Serum uric acid level is lower among females than males. Hyperuricemia is statistically significantly associated with older age(Age>50years), Diabetes mellitus and hypertension.Hyperuricemia becomesmore prevalent while multiple cardiovascular risk factors are operating.Hyperuricemia is statistically significantly associated with Anterior wall STEMI.Hyperuricemia is statistically significantly associated with early complications of STEMI.

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