Original Research Article

Assessment of prognosis in acute myocardial infarction in correlation with Killip class on day 0, day 3, day 7

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Abstract

Background: Acute myocardial infarction (AMI) is one of the most common diagnoses in hospitalized patients in industrialized countries. World-wide, approximately 650,000 patients experience a new AMI and 450,000 experience a recurrent AMI each year. **Aims and Objectives:** A study of Assessment of prognosis in acute myocardial infarction in correlation with Killip class on day 0, day 3, day 7**. Methodology:** This Single center prospective study carried out in Karnataka institute of medical sciences Hubli. A total of 100 patients of AMI admitted to Medical wards and ICCU department of Department of Medicine were included in the study All patients of age Age >18 yrs. The statistical analysis was done by paired and unpaired t-test and co-relation calculated by SPSS 19 version software. **Result:** Out of 13 patients who belonged to killip class 4 on day 0, 6 patients expired during 7 day follow up. It is statistically significant i.e. Patients in killip class 4 have a poor prognosis after acute myocardial infarction. On day 3, 2 patients who were in killip class 3 expired during 7 day follow up .Four patients were in killip class 4 on day 3. All six patients expired between day 3 and day 7 of follow up. I.e. all patients who have expired belonged to higher killip class (3 or 4) with higher mean uric acid. This scatter plot shows that when the serum uric acid level on the day of admission was correlated with CK-MB values, a strong positive correlation was obtained, that is, as the value of one increases the other also increases as shown in this scatter plot. **Conclusion:** From our study, we conclude that SUA levels are correlated with Killip Class and patients with higher Killip Class have higher SUA levels in AMI. Hyperuricemia is an indicator of poor prognosis in acute myocardial Infarction. Serum uric acid can be used as a marker of short-term mortality in acute myocardial infarction.

Key words: Killip Class, Serum Uric Acid (SUA), Prognosis of MI

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INTRODUCTION

Acute myocardial infarction (AMI) is one of the most common diagnoses in hospitalized patients in industrialized countries. World-wide , approximately 650,000 patients experience a new AMI and 450,000 experience a recurrent AMI each year. The early (30-day) mortality rate from AMI is 30%, with more than half of these deaths occurring before the stricken individual reaches the hospital. 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) as compared with younger patients.[1] Clinical studies have proved that serum uric acid (SUA) is significantly associated with cardiovascular disease. [2-4] Uric acid is an independent predictor of major adverse cardiovascular events (MACE) in patients with coronary artery disease.4-5 High serum uric acid causes increasing platelet reactivity mediating inflammation and stimulation

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of smooth muscle cell proliferation which probably worsens acute thrombosis.[7,8] Following myocardial infarction (MI) some proteins and enzymes labeled as cardiac markers (CPK-MB / Troponin T) are released in large quantity from necrotic heart muscle into the circulation. Epidemiological studies have shown that uric acid may be a risk factor for cardiovascular diseases. So we have studied the prognosis in acute myocardial infarction in correlation with Killip class on day 0, day 3, day 7

METHODOLOGY

This Single center prospective study carried out in Karnataka institute of medical sciences Hubli. A total of 100 patients of AMI admitted to Medical wards and ICCU department of Department of Medicine were included in the study after considering inclusion and exclusion criteria. Information was collected through a pretested and structured proforma. Study was carried was carried in patients with clinical features suggestive of acute Myocardial Infarction A detailed history and physical examination of the patients with acute myocardial infarction with special reference to Killip classification of heart failure was carried out .serum uric acid levels were measured on day 0,day 3 , day 7 .serum uric acid and Killip class on day 0 day 3 day 7 were compared to assess the prognosis . All the patients gave informed consent and the study protocol was approved by the college ethics committee. All patients of age Age >18 yrs.

ST elevation Myocardial Infarction, Non ST elevation myocardial Infarction were included into study while Chronic kidney disease , Gout , Hematological malignancy , Patients on drugs such as Salicylates, Ethambutol, Pyrazinamide were excluded from the study. All routine testing with Serum Uric Acid and Killip class on day 0 day 3 day 7 were compared . The statistical analysis was done by paired and unpaired t-test and co-relation calculated by SPSS 19 version software.

RESULT

Table 1: Association between Killip classes at day 3 with status of mortality

KILLIP day 0	Alive	Death	Total
Class 1	57	0	57
Class 2	16	0	16
Class 3	14	0	14
Class 4	7	6	13
Total	**94**	**6**	**100**

Chi-square= 42.7173 p=0.00001*

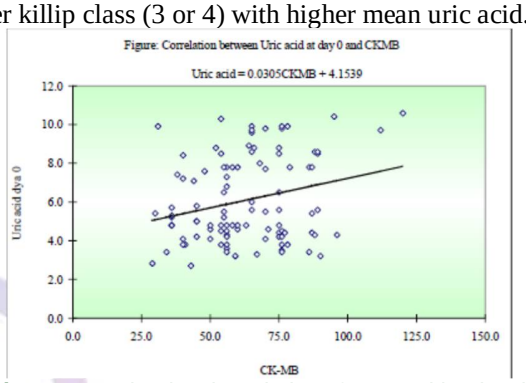
Out of 13 patients who belonged to killip class 4 on day 0, 6 patients expired during 7 day follow up. It is statistically significant i.e. Patients in killip class 4 have a poor prognosis after acute myocardial infarction.

Table 2: Association between Killip classes at day 3 with status of mortality

KILLIP day 3	Alive	Death	Total
Class 1	65	0	65
Class 2	22	0	22
Class 3	4	2	6
Class 4	3	4	7
Total	**94**	**6**	**100**

Chi-square= 45.9643 p=0.00001*

On day 3, 2 patients who were in killip class 3 expired during 7 day follow up .Four patients were in killip class 4 on day 3. All six patients expired between day 3 and day 7 of follow up. I.e. all patients who have expired belonged to higher killip class (3 or 4) with higher mean uric acid.



Graph 1: Scatter plot showing relation of CKMB with uric acid at day 0

This scatter plot shows that when the serum uric acid level on the day of admission was correlated with CK-MB values, a strong positive correlation was obtained, that is, as the value of one increases the other also increases as shown in this scatter plot.

DISCUSSION

THE KILLIP'S CLASSIFICATION: [9]

The classification proposed by Thomas Killip III and John T. Kimball in 1967 involved bedside stratification. This stratification was based on the physical examination of patients with possible acute myocardial infarction (AMI), and it was used to identify those at the highest risk of death and the potential benefits of specialized care in coronary care units (CCUs). This study described 250 cases with suspected AMI admitted to the CCU of a university hospital in the United States. There were no objective clinical outcomes nor systematic collection of data or adjustments for confounding factors; moreover, there were no validations in an independent series of patients. The cases were stratified into the following classes [10]

- Killip class 1 : patients with no clinical signs of heart failure
- Killip class 2 : patients with rales in the lungs ,third heart sound (s3) and

elevated jugular venous pressure

 Killip class 3 : patients with features of frank pulmonary edema

 Killip class 4 : with cardiogenic shock or arterial hypotension (measured as
systolic blood pressure < 90 mmHg), and evidence of peripheral
vasoconstriction (oliguria, cyanosis, and diaphoresis

MORTALITY AND KILLIP CLASS

Class	Mortality
Killip class 1	6%
Killip class 2	17%
Killip class 3	38%
Killip class 4	81%

KILLIP CLASS AND URIC ACID CORRELATION VARIOUS STUDIES :

In M Y Nadkar *et al* [12] it was found that there was statistical significant (p=<0.05) increase in serum uric acid levels with increase in killip class on day 0 day 3 day 7 .higher killip class had higher uric acid level.

Shetty *et al* [11] found there was a significant correlation between higher killip class and serum uric acid in all patient's assessed on day 0 ,day 7 (p<0.001).

S Agarwal *et al* [15] found that there was statistically significant (p<0.05) higher uric acid levels on all days with higher killip class.

Gandaiah *et al* [13] found that there was statistically significant (p<0.05) higher uric acid levels on all days with higher killip class.

In our study we found that on all days with increasing killip class there is increasing mean uric acid level. We found statistical significant difference (P<0.00001) on day 0, day 3, day7.

Mortality and killip class comparison with various studies

STUDY	No of patients studied	No of patient's died between day 0 and day 3	No of patient's died between day 3and day 7	Patient's killip class
M Y Nadkar *et al* [12]	100	1(1%)	5 (5%)	IV
Gandaiah *et al* [13]	100	0	6(6%)	IV
Shetty *et al* [11]	80	3 (4%)	3(4%)	IV
S Agarwal *et al* [15]	100	3 (3%)	20(20%)	III/IV
Present study	**100**	**0**	**6 (6%)**	**III/ IV**

CONCLUSION

From our study, we conclude that SUA levels are correlated with Killip Class and patients with higher Killip Class have higher SUA levels in AMI. Hyperuricemia is an indicator of poor prognosis in acute myocardial Infarction. Serum uric acid can be used as a marker of short-term mortality in acute myocardial infarction.

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