

PUBLICATIONS

ASSESSMENT OF RENAL FUNCTION IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION AND CARDIORENOMETABOLIC SYNDROME

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To assess renal functional status in patients with cardiorenometabolic syndrome (CRMS) and acute myocardial infarction (AMI), and to determine the association between renal dysfunction, diabetes mellitus (DM), and hyperuricemia.

The study included 140 patients with AMI admitted to the Cardiac Intensive Care Unit of RSSPMCC, including 90 women and 50 men. Patients were divided into those with (n=58; 41%) and without type 2 diabetes (n=82; 59%). Renal function parameters, including urea, creatinine, uric acid, eGFR, MAU, and albumin-to-creatinine ratio, were assessed according to the 2023 ESC Guidelines. Laboratory analyses were performed using a RANDOX Daytona analyzer, and statistical analysis was conducted with SPSS 27.0.

Analysis of laboratory parameters characterizing renal function showed a mean creatinine level of 83.9 ± 27.3 and a mean blood urea level of 6.74 ± 2.59 . The mean eGFR among 130 patients in whom it was determined was 76.4 ± 21.1 mL/min/1.73 m². According to eGFR, 44 patients (33.8%) had an eGFR ≥ 90 mL/min/1.73 m², 60 patients (46.2%) had an eGFR of 60–89 mL/min/1.73 m², 12 patients (9.2%) had an eGFR of 45–59 mL/min/1.73 m², 12 patients (9.2%) had an eGFR of 30–44 mL/min/1.73 m², and 2 patients (1.5%) had an eGFR < 30 mL/min/1.73 m². Thus, 26 patients (20.0%) had an eGFR < 60 mL/min/1.73 m². A significant deterioration in renal function was observed in patients in Group 1. In Group 2, eGFR was 84.0 [65.5; 95.0] mL/min/1.73 m², whereas in Group 1 it was 75.0 [56.5; 90.0] mL/min/1.73 m² ($p=0.018$). Creatinine levels were significantly higher in Group 1 than in Group 2 (85.0 vs. 75.0 ; $p=0.033$). Similarly, blood urea levels were higher in Group 1 (6.95 vs. 5.60 ; $p<0.001$).

MAU was also more pronounced in patients in Group 1. The MAU level was 55.0 in Group 1 compared with 23.5 in Group 2 ($p<0.001$). The albumin-to-creatinine ratio was likewise higher in Group 1 based on the available data, at 5.80 versus 2.38 ($p=0.002$). The frequency of eGFR < 60 mL/min/1.73 m² was 29.1% (16/55) in Group 1 and 13.3% (10/75) in Group 2. This difference was statistically significant ($p=0.044$). The presence of hyperuricemia was also found to be associated with renal dysfunction. In patients without hyperuricemia, eGFR was 86.5 [71.5; 95.0] mL/min/1.73 m², whereas in patients with hyperuricemia it decreased to 64.0 [51.5; 85.0] mL/min/1.73 m² ($p<0.001$). Creatinine levels were 70.0 and 88.0 in patients without and with hyperuricemia, respectively ($p<0.001$). The median MAU was 26.0 and 55.5 , respectively, and was significantly higher in the hyperuricemic group ($p<0.001$). An eGFR < 60 mL/min/1.73 m² was detected in 36.2% of patients with hyperuricemia, compared with 8.1% of patients without hyperuricemia ($p<0.001$). Correlation analysis revealed a strong inverse correlation between eGFR and creatinine ($r=-0.752$; $p<0.001$). In addition, eGFR demonstrated inverse correlations with age ($r=-0.426$; $p<0.001$), MAU ($r=-0.377$; $p<0.001$), and uric acid levels ($r=-0.452$; $p<0.001$).

DM was associated with lower eGFR, higher creatinine, urea, and MAU levels. Hyperuricemia was also associated with reduced eGFR and increased creatinine and MAU. Significant inverse correlations of eGFR with creatinine, age, MAU, and uric acid emphasize the need for comprehensive renal assessment in patients with CRMS.