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PREDICTORS OF CONTRAST INDUCED NEPHROPATHY DEVELOPMENT IN PATIENTS FOLLOWING CORONARY ANGIOGRAPHY FOR AN ACUTE MYOCARDIAL INFARCTION

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Relevance. Contrast induced nephropathy (CIN) in patients with acute myocardial infarction accelerates the development of end stage chronic kidney disease (CKD), putting an emphasis studying the parameters that influence CIN development

Aim: this study investigates the influence of different parameters on the development of CIN in patients that underwent coronary angiography for acute myocardial infarction in type 2 diabetic patients

Materials and methods. We conducted a retrospective observational cohort study. Analysis of 50 patients from existing medical records that underwent coronary angiography and had a coexisting diagnosis of DM T2. Parameters that include: Age, sex, body mass index (BMI), Glycated haemoglobin (HbA1c), baseline creatinine, sodium, potassium, fibrinogen, hematocrit, 48 hour creatinine, % change in creatinine, baseline estimated glomerular filtration rate (eGFR), 48 hour eGFR, contrast type, contrast volume (CV), extent of myocardial infarction, left ventricular ejection fraction (LVEF), blood pressure, heart rate (HR) were collected to conduct a retrospective observational study

Results and their discussion. A total of 50 patients undergoing coronary angiography were analysed, of whom 6 (12.0%) developed CIN, 14 (28.0%) exhibited subclinical creatinine elevation, and 25 (50.0%) showed no increase in creatinine. In the overall cohort, the CV to eGFR ratio (CV/eGFR) demonstrated the strongest association with CIN (6.60 vs 3.43), outperforming absolute CV (288.33 vs 222.95 mL). Patients with CIN had higher baseline creatinine (111.5 vs 93.9 μmol/L), lower eGFR (60.79 vs 69.80 mL/min/1.73 m²), higher post-PCI HR (83.4 vs 68.8 bpm), lower LVEF (45.0% vs 51.75%), and higher fibrinogen levels (4.00 vs 3.39 g/L,), while serum glucose showed a weak association (10.84 vs 9.73 mmol/L) in CIN and non-CIN groups respectively while difference in electrolytes, hematocrit, and proteinuria were not established. Within the CIN group, the severity of renal impairment (+53.99% creatinine increase) correlated with age (r=0.50), HbA1c (r=0.52), potassium (r=0.54), and CV (r=0.40), whereas LVEF and fibrinogen showed minimal internal correlation. In patients with subclinical creatinine elevation (15.95% on average) were primarily driven by baseline creatinine (r=0.74), baseline eGFR (r=-0.63), and CV/eGFR ratio (r=0.52), with moderate contributions from fibrinogen (r=0.50) and potassium (r=0.42) In contrast, patients without creatinine increase demonstrated improved renal parameters (-10.66%), with weak association between CV and renal changes, and only weak relationships with baseline renal function and metabolic variables. Overall, these findings indicate that renal outcomes after contrast exposure are primarily determined by the interaction between CV and baseline kidney function, with CV/eGFR ratio enhancing the precision of risk assessment

Conclusions. CIN after coronary angiography is primarily determined by the interaction between contrast load and baseline renal function, with the CV/eGFR ratio emerging as the most reliable predictor. While absolute CV alone showed limited predictive value, additional factors such as reduced LVEF, elevated fibrinogen, and higher metabolic burden were associated with increased risk or severity of renal dysfunction. In contrast, electrolytes, hematocrit, and proteinuria showed weak correlation in this dataset. These findings support the importance of individualized risk assessment using integrated clinical and biochemical parameters, rather than relying on CV alone