

ASSESSING ACUTE KIDNEY INJURY RISK FROM CONTRAST: MEHRAN SCORE VS AMERICAN COLLEGE OF RADIOLOGY GUIDELINES

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Introduction. Acute kidney injury (AKI) is a sudden decline in kidney function, leading to impaired waste and electrolyte elimination. What was once called "contrast-induced nephropathy" is now referred to as "contrast-associated Acute kidney injury." A 1983 Harvard study suggested contrast was a leading cause of hospital-acquired AKI, but recent evidence increasingly challenges this view. Today, several tools are used to assess AKI risk—this paper compares two of them: the Mehran Score and the American College of Radiology (ACR) Guidelines.

Objective of the study. The objective of this study is to determine if there is a variation in risk stratification using Mehran Score and ACR guidelines.

Materials and methods. Ten virtual patients with a range of illnesses and comorbidities were generated, including sepsis, anemia, diabetes mellitus, hypertension, chronic kidney disease (CKD), urinary tract infections (UTI), congestive heart failure (CHF), and postoperative. Mehran Score and ACR recommendations were used to evaluate the risk of contract-associated AKI.

Research results. Ten virtual patient cases were evaluated with both ACR Guidelines and Mehran Risk Score to calculate AKI risk following contrast exposure. In five of them (Patients 1, 2, 4, 8, and 10), the two correlated well. A young healthy patient (Patient 2), for example, was appropriately assigned low risk by both, as was a patient with congestive heart failure, diabetes, and estimated glomerular filtration rate (eGFR) <30 (Patient 4), who was always assigned high risk. There were discrepancies, however, in acute cases. Patients 3 and 5, with infection or sepsis and borderline renal function, were classified as high risk by ACR based on acute illness, but moderate only by Mehran, who does not incorporate hypotension or sepsis into her model unless extremely severe. Conversely, Patient 6 with moderate CKD and no comorbidities was classified as moderate risk by ACR (on the basis of eGFR <45), whereas Mehran risk scored this patient as low risk. Conversely, Patient 7—aged with anemia and mild congestive heart failure—was graded moderate by Mehran but low to moderate by ACR, demonstrating the score's responsiveness to comorbidity despite normal kidney function.

Conclusion. ACR appeared more sensitive to clinical context, while the Mehran Score gave standardized but less flexible risk estimates, especially outside cardiology practice. Contrast-induced AKI remains a complex and clinically significant problem. Current evidence suggests that iodinated contrast is not typically the sole cause of AKI but rather is one component of a multifactorial risk that is conditional on pre-existing renal function, comorbidities, and acute clinical conditions. Contrast use must always

involve a careful consideration of both the potential diagnostic benefit and the accompanying renal risk. As studies continue, more research is needed to refine risk stratification tools and to ensure that the use of contrast is guided by accurate, context-specific information rather than out-of-date assumptions.