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Risk Stratification for Contrast-induced Nephropathy in NSTEMI: Does the H_2FPEF Score Add Value?

Sinem Çakal

University of Health Science Türkiye, Department of Cardiology, Haseki Training and Research Hospital, İstanbul, Türkiye

Contrast-induced nephropathy (CIN) remains a significant complication following percutaneous coronary intervention (PCI), with the potential to worsen patient outcomes by increasing morbidity, mortality, and healthcare costs due to prolonged hospitalizations. Identifying reliable predictors of CIN is thus of great clinical importance. This study provides valuable insights into the prediction of CIN in patients with non-ST-segment elevation myocardial infarction undergoing emergency PCI. This prospective, single-center study included 600 patients. The authors investigated the predictive value of the heart failure with preserved ejection fraction score, a score initially designed to help distinguish H_2FPEF from other causes of dyspnea. By integrating clinical and echocardiographic parameters such as age, body mass index, hypertension, atrial fibrillation (AF), pulmonary artery systolic pressure, and E/e' ratio, the H_2FPEF score offers a practical tool, easily accessible at the bedside.

The authors found that patients who developed CIN had significantly higher H_2FPEF scores. Multivariate logistic regression identified age, diabetes mellitus, and the H_2FPEF score as independent predictors of CIN, with an area under the curve (AUC) of 0.575 for the score at a cutoff >1. The score demonstrated high sensitivity (85.39%) but modest specificity (50.49%) and a low positive predictive value (16.1%), while maintaining a relatively high negative predictive value (89.8%). These findings are consistent with and extend previous observations, suggesting that the H_2FPEF score is useful beyond its initial application. Previous studies have shown that components of the H_2FPEF score, such as age, body mass index, and AF, are individually associated with increased risk of CIN. By combining these into a single score, the study suggests a potentially simplified approach to risk assessment. However, the modest AUC and the low positive predictive value underline the limited discriminatory power of the H_2FPEF score as a standalone predictive tool. Although it may help identify low-risk patients (given its high negative predictive value), relying solely on this score for preprocedural risk stratification may lead to under- or overestimation of true risk in some patients.

Several limitations should be emphasized. The single-center design and relatively small sample of patients developing CIN (only 89 out of 600) may restrict external validity. The study lacks an external validation cohort, which would be crucial to confirm the reproducibility of these findings in diverse clinical settings. Additionally, the absence of standardized hydration or contrast volume protocols might have introduced variability in CIN occurrence. Another important point is the potential for integrating the H_2FPEF score with other established risk scores for CIN, such as the Mehran risk score. Combining clinical scores with novel biomarkers (eg., cystatin C, neutrophil gelatinase-associated lipocalin) or advanced imaging parameters may further enhance predictive accuracy. From a clinical perspective, while the results suggest that a higher H_2FPEF score is associated with increased CIN risk, the practical implications remain to be fully defined. The score might be used to identify patients who require more aggressive preventive strategies (eg., optimized hydration, minimization of contrast volume,

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Address for Correspondence: Asst. Prof. Sinem Çakal, University of Health Science Türkiye, Department of Cardiology, Haseki Training and Research Hospital, İstanbul, Türkiye
E-mail: sinemdnzcakal@gmail.com
ORCID ID: orcid.org/0000-0003-2714-4584

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or avoidance of nephrotoxic agents). However, it should not replace comprehensive clinical assessment and individual risk assessment unless it has strong predictive capacity. In conclusion, Sabry et al.[1] have contributed significantly to the ongoing efforts to improve the risk stratification for CIN in patients undergoing PCI. The study highlights the need for further large-scale, multicenter studies to confirm these preliminary findings and explore combined models incorporating the H_2FPEF score. Until then, the score should be viewed as an adjunct rather than a definitive decision-making tool.

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