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Low-osmolar versus Iso-osmolar Contrast Media on the Risk of Contrast-induced Acute Kidney Injury: A Propensity Score Matched Study

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Objectives: Among the various risk factors associated with contrast-induced acute kidney injury (CI-AKI), the importance of osmolality and viscosity is emerging among the characteristics of contrast media (CM) itself. High osmolality CM (HOCM) is deprecated and low osmotic pressure (LOCM) and iso-osmotic pressure (IOCM) are mainly used in clinical situations where the results of studies on their effect on the development of CI-AKI are contradictory. We evaluated the association between type of CM and risk of CI-AKI.

Methods: A retrospective observational cohort study to analyze the effect of type of CM on the development of CI-AKI. Using propensity score matching, 2,264 LOCM and IOCM group were paired for analysis from 5,276 patients and fulfilled the inclusion criteria among 12,742 patients who underwent CAG between January 1, 2007 and December 31, 2016. LOCM was iopromide and iopamidol was used, and IOCM was iodixanol. CI-AKI, which was the primary end point, was defined based on Kidney Disease Improving Global Outcomes criteria within 48 hours after exposure to the CM.

Results: LOCM users showed an increased incidence of CI-AKI (11.7% vs. 9.4%; P = 0.005), but it lost statistical significance after PS matching (11.0% vs. 10.5%, P = 0.070). In multivariable analyses, the adjusted odds ratio for CI-AKI in LOCM group were 1.059 [95% confidence interval (CI) = 0.875–1.282; P = 0.555] in unmatched cohort and 1.100 (95% CI = 0.897–1.348; P = 0.361) in matched cohort.

Conclusions: Although the role of CM types in the development of CI-AKI has been debated, our observation shows that the selection between LOCM and IOCM during CAG has no influence on the incidence of CI-AKI.