Clinical and laboratory aspects of predicting the development of chronic kidney disease in patients with contrast-induced nephropathy.

Mustafayeva Malika Rustamovna.
Bukhara State Medical Institute,Bukhara, Uzbekistan.

Contrast-induced nephropathy (CIN) represents an increasing healthcare burden and challenge as the frequency of diagnostic imaging and interventional procedures increases, particularly among patients at risk for developing CIN. Universally accepted strategies to reduce the risk for CIN include careful patient screening and selection, adequate patient hydration, limiting the volume of contrast medium administered, and choosing a safe, non-ionic, low-osmolar contrast agent. For both intra-arterial and intravenous use, all ionic and non-ionic iodinated contrast agents may further impair renal function in high-risk patients. Based on comparisons of contrast media in proximal renal tubular cell culture and in recent robust head-to-head prospective clinical trials in high-risk patients, however, iso-osmolar iodixanol and low-osmolar iopamidol are comparable and appear to be the contrast agents of choice to reduce renal risk for CIN.

Iodinated contrast is a mainstay for diagnostic and interventional procedures performed by cardiologists, radiologists and other specialists. With the emergence of computed tomographic techniques for the evaluation of cardiac disease, malignancies, trauma and a variety of other internal disorders, the use of iodinated contrast is expected to increase dramatically over the next few years. There has been considerable refinement over the past decades from ionic high-osmolar, to nonionic low-osmolar and finally to nonionic iso-osmolar contrast. Iodixanol is the only nonionic iso-osmolar contrast approved for intravascular use. This contrast agent has the lowest rates of systemic and renal adverse events. Clinical trials have demonstrated the lowest rates of contrast-induced nephropathy among all currently available forms of iodinated contrast. Specifically, iodixanol has been associated with a 71% relative risk reduction for contrast-induced nephropathy compared with low-osmolar agents in head-to-head randomized trials. This article reviews the structure, pharmacology and outcomes associated with iodixanol.

The present study is a multicenter, randomized, double-blind comparison of iopamidol and iodixanol in patients with chronic kidney disease (estimated glomerular filtration rate, 20 to 59 mL/min) who underwent cardiac angiography or percutaneous coronary interventions. Serum creatinine (SCr) levels and estimated glomerular filtration rate were assessed at baseline and 2 to 5 days after receiving medications. The primary

outcome was a postdose SCr increase > or = 0.5 mg/dL (44.2 micromol/L) over baseline. Secondary outcomes were a postdose SCr increase > or = 25%, a postdose estimated glomerular filtration rate decrease of > or = 25%, and the mean peak change in SCr. In 414 patients, contrast volume, presence of diabetes mellitus, use of N-acetylcysteine, mean baseline SCr, and estimated glomerular filtration rate were comparable in the 2 groups. SCr increases > or = 0.5 mg/dL occurred in 4.4% (9 of 204 patients) after iopamidol and 6.7% (14 of 210 patients) after iodixanol (P=0.39), whereas rates of SCr increases > or = 25% were 9.8% and 12.4%, respectively (P=0.44). In patients with diabetes, SCr increases > or = 0.5 mg/dL were 5.1% (4 of 78 patients) with iopamidol and 13.0% (12 of 92 patients) with iodixanol (P=0.11), whereas SCr increases > or = 25% were 10.3% and 15.2%, respectively (P=0.37). Mean post-SCr increases were significantly less with iopamidol (all patients: 0.07 versus 0.12 mg/dL, 6.2 versus 10.6 micromol/L, P=0.03; patients with diabetes: 0.07 versus 0.16 mg/dL, 6.2 versus 14.1 micromol/L, P=0.01).

Conclusions: The rate of contrast-induced nephropathy, defined by multiple end points, is not statistically different after the intraarterial administration of iopamidol or iodixanol to high-risk patients, with or without diabetes mellitus. Any true difference between the agents is small and not likely to be clinically significant.