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ACUTE KIDNEY INJURY

Atorvastatin may reduce risk of contrast-induced AKI

The addition of atorvastatin to hydration therapy and *N*-acetylcysteine (NAC) reduces the incidence of acute kidney injury (AKI) in patients receiving iodinated contrast media, according to new research. "The present study confirms the effectiveness of the combined approach with hydration and high-dose NAC in preventing contrast-induced AKI. The addition of high-dose atorvastatin potentiates this prophylactic effect," explains researcher Carlo Briguori.

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Iodinated contrast media is important for many diagnostic and interventional procedures but can lead to renal dysfunction. Contrast-induced AKI accounts for about 10% of hospital-acquired renal failure and has a poor prognosis. Previous studies demonstrating that oxidative stress and apoptosis have key roles in the pathogenesis of contrast-induced AKI led Briguori and colleagues to investigate whether atorvastatin—which has antioxidant properties—might modify intracellular signalling pathways and outcomes for patients exposed to contrast media.

The researchers analysed a subgroup of patients with chronic kidney disease (CKD) who were enrolled in the NAPLES II trial. Patients scheduled for elective coronary angiography or percutaneous coronary intervention were randomly allocated to receive 80 mg atorvastatin within 24 h before exposure to contrast media ($n = 202$) or to no atorvastatin ($n = 208$). All patients received NAC and sodium bicarbonate solution. Fewer patients in the atorvastatin arm than in the control arm developed the primary outcome of contrast-induced AKI, defined as a 10% increase in serum cystatin C level 24 h after exposure to contrast media (4.5% versus 18.4%, respectively; $P = 0.005$); this effect was independent of diabetes status. However, atorvastatin had no beneficial effect on the risk of contrast-induced AKI in patients with severe CKD (defined as an estimated glomerular filtration rate of ≤30 ml/min/1.73 m^2).

To investigate the mechanism by which atorvastatin protects against contrast-induced AKI, the researchers added atorvastatin to MDCK and HK2 cells before exposing them to contrast media. Atorvastatin administration activated survival pathways and reduced cell apoptosis. Pretreatment with NAC led to further improvements in cell survival.

The researchers are now planning further studies to investigate the potential role of antioxidants in combination with hydration therapy in the prophylaxis of contrast-induced AKI.

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Original article Quintavalle, C. *et al*. Impact of a high loading dose of atorvastatin on contrast-induced acute kidney injury. *Circulation* doi:10.1161/CIRCULATIONAHA.112.103317