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22nd WORLD CARDIOLOGY CONFERENCE

December 11-12, 2017 | Rome, Italy

The efficacy of oral trimetazidine in preventing contrast-induced nephropathy among patients undergoing elective coronary procedures: a meta-analysis of randomized controlled trials

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Background: Contrast-induced nephropathy (CIN) is a serious complication of coronary procedures. Trimetazidine (TMZ) has recently been explored for CIN prevention due to its anti-ischemic and antioxidant properties.

Research Question: Among adult patients undergoing elective percutaneous coronary procedures, how effective is oral TMZ in addition to standard therapy in preventing CIN?

Objectives: To assess the efficacy of oral TMZ in the prevention of contrast-induced nephropathy during elective coronary angiography and percutaneous coronary intervention (PCI).

Methods: We searched the Cochrane Central Register of Controlled Trials, PubMed/MEDLINE, EMBASE, clinicaltrials.gov until June 2016 for randomized controlled trials examining the effects of adding oral TMZ to standard therapy in preventing CIN. Outcome measures were an incidence of CIN, defined as a 0.5 mg/dl or \geq 25% increase in serum creatinine 48-72 hours post-procedure, and incidence of dialysis-requiring CIN. The validity of studies was assessed through the Cochrane Risk Assessment Tool. The treatment effect was estimated using the Mantel-Haenszel weighted risk ratio (RR) with a fixed-effects model available from RevMan 5.3.

Results: Four studies comprising 714 patients (TMZ= 352, Control= 362) were included in the final analysis. Results revealed a significantly lower incidence of CIN in the TMZ group compared to control (RR 0.33, 95% confidence interval [CI], 0.20, 0.53; P < .00001), with a relative risk reduction of 67%. No dialysis-requiring CIN was observed in the included studies.

Conclusion: Current evidence suggests that addition of TMZ confers benefit in preventing CIN after coronary procedures among patients with mild to moderate renal impairment. We recommend that TMZ is considered as an adjunct prevention strategy. Larger trials should be conducted to determine its effect on outcomes such as prevention of dialysis-requiring CIN and mortality.

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