

Effectiveness of Theophylline in Preventing Contrast-Induced Nephropathy After Coronary Angiographic Procedures.

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Source

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Abstract

Background: Contrast-induced nephropathy (CIN) is the third most common cause of hospital acquired acute renal failure and is associated with increased morbidity and mortality. The use of theophylline for prevention of CIN has yielded conflicting results. This study aimed at examining the effectiveness of theophylline in prevention of CIN when added to IV hydration and N-acetylcysteine (NAC). Methods: Patients with stable serum creatinine and at least moderate risk for CIN according to Mehran's risk score were included in this parallel group, 1:1, single-blind, randomized controlled trial. All patients received IV hydration (1 mL/kg per hour for 24 hours) and NAC (600 mg bid for 2 days). Patients were randomized to placebo (group P) or theophylline (200 mg in 100 mL 0.9% saline, as IV infusion 30 minutes before contrast medium (CM) administration; group T). Patients underwent standard coronary angiography \pm angioplasty. Serum creatinine (SCr) was assessed just before and 72 hours after contrast administration and estimated glomerular filtration rate (eGFR) was calculated. Results: This study included 60 patients with mean SCr 1.44 ± 0.7 mg/dL and eGFR 60.2 ± 29.2 mL/min. Mean SCr among group T was 1.54 ± 0.7 mg/dL with eGFR 58.6 ± 28.6 mL/min, while group P showed mean SCr of 1.34 ± 0.7 mg/dL and eGFR of 61.8 ± 30.1 mL/min. Among group P, 6 (20%) patients developed CIN while none of the patients in group T developed CIN. In comparison to placebo, theophylline significantly decreased SCr ($P = 0.0001$) and increased eGFR ($P = 0.001$) at 72 hours. Multivariate regression analysis showed that receiving placebo instead of theophylline, anemia, congestive heart failure, chronic renal impairment, and high-contrast load are all independent predictors for deteriorating renal function after CM administration. Conclusion: Theophylline seems to be an effective prophylaxis against CIN for moderate- and high-risk patients undergoing coronary angiography or angioplasty. It offers additive protection when added to IV hydration and NAC. (J Interven Cardiol 2012;**:1-7).