

## Intravenous magnesium sulfate: new method in prevention of contrast-induced nephropathy in primary percutaneous coronary intervention

Ata Firouzi · Mohsen Maadani · Reza Kiani ·  
Farshad Shakerian · Hamid Reza Sanati ·  
Ali Zahedmehr · Seyedabbas Nabavi · Mona Heidarali

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### Abstract

**Background** Contrast-induced acute kidney injury (CI-AKI) is an adverse consequence of percutaneous coronary interventions which results in significant morbidity and mortality and adds to the costs of diagnostic and interventional cardiology procedures. Various pathophysiological mechanisms have been proposed for CI-AKI and various agents tested for its prevention. There is currently a general agreement that adequate pre-procedural hydration constitutes the cornerstone of prevention, yet there are reports of the use of some other agents with various efficacies. We prospectively tested IV magnesium sulfate (Mg) for CI-AKI prevention.

**Method and design** This study is a prospective, randomized, open-labeled, single-center clinical trial. We randomly assigned 122 consecutive patients to two groups. The first group was the control group with routine treatment ( $n = 64$ ), and second group was the study group with routine treatment plus IV magnesium sulfate 1 g just before the procedure ( $n = 62$ ). Serum creatinine was measured before the procedure and 2 days after the procedure. The primary end point was the occurrence of CI-AKI within 48 h. CI-AKI was defined as 0.5 mg/dl or more increase in serum creatinine or 25 % or more increase above baseline

serum creatinine. There was no difference in definition if both of these parameters were present.

**Results** The control and study groups were comparable in the overall predicted risk of CI-AKI. Also, the type and volume of the contrast were not significantly different between the two groups. Following angioplasty, CI-AKI occurred in 17 (26.6 %) patients in the control group and nine (14.5 %) patients in the study group; there was a significant reduction in CI-AKI in the study group ( $P = 0.01$ ). Additionally, there was no mortality or a need for hemodialysis in either group.

**Conclusion** In primary PCI patients, the prophylactic use of intravenous Mg can be recommended to be added to traditional hydration for CI-AKI prevention.

**Keywords** Contrast media · Angioplasty · Primary percutaneous coronary intervention · Contrast-induced acute kidney injury · Magnesium sulfate

### Introduction

Contrast-induced acute kidney injury (CI-AKI) is one of the complications of contrast media usage in diagnostic and therapeutic cardiology procedures. With the currently increasing number of procedures that need contrast media, there has been significant growth in the incidence of CI-AKI in the recent years. CI-AKI is now the third most common cause of hospital-acquired renal failure and accounts for approximately 11 % of all cases of acute renal failure [1]. Furthermore, CI-AKI increases not only morbidity and mortality but also length of hospitalization and accelerates the process toward end-stage renal disease in vulnerable patients; 1 % of CI-AKI patients require dialysis, and about half of them will end in end-stage renal failure [1].

A. Firouzi · M. Maadani · R. Kiani (✉) · F. Shakerian ·  
H. R. Sanati · A. Zahedmehr · S. Nabavi  
Department of Interventional Cardiology, Cardiovascular  
Intervention Research Center, Rajaie Cardiovascular Medical  
and Research Center, Iran University of Medical Sciences,  
Tehran, Iran  
e-mail: re.kiani@gmail.com

M. Heidarali  
Cardiac electrophysiology research center, Rajaie cardiovascular  
medical and research center, Iran university of medical sciences,  
Tehran, Iran