

Impact of Oral Nicorandil Intake on Incidence of Acute Kidney Injury in Diabetic Patients with Renal dysfunction Undergoing Elective Percutaneous Coronary Intervention

A Thesis

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم العظيم

صدق الله العظيم

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List of abbreviations

| | |
|---------------|---|
| PCI | : Percutaneous coronary angiography |
| CI-AKI | : Contrast-induced acute kidney injury |
| CHF | : Congestive heart failure |
| CKD | : Chronic Kidney Disease |
| MDRD | : Modification of diet in renal disease |
| ROS | : Reactive oxygen species |
| CIN | : Contrast-induced nephropathy |
| ATP | : Adenosine triphosphate |
| NO | : Nitric oxide |
| DM | : Diabetes mellitus |
| IABP | : Intra-aortic balloon pump |
| eGFR | : estimated glomerular filtration rate |
| HOCM | : High-osmolar contrast media |
| LOCM | : Low-osmolar contrast media |
| IOCM | : Iso-osmolar contrast media |
| AKI | : acute kidney injury |
| ESC | : European society of cardiology |
| AHA | : American heart association |
| RCT | : randomized controlled trial |
| EBP | : extracorporeal blood purification |
| IDF | : International diabetes federation |
| ADA | : American diabetes association |
| WHO | : world health organization |
| GDM | : gestational diabetes mellitus |
| HIV | : Human immunodeficiency virus |
| AIDS | : Acquired immune deficiency syndrome |
| FPG | : fasting plasma glucose |
| ESRD | : End-stage renal disease |
| DKD | : Diabetic kidney disease |
| Cr | : Creatinine |

| | |
|-------------------|--|
| s. Cr | : Serum creatinine |
| ACE | : Angiotensin converting enzyme |
| IHD | : ischemic heart disease |
| GBD | : global burden of disease |
| VOC | : voltage sensitive calcium channel |
| ROC | : Receptor operated calcium channel |
| MLCP | : Myosin light chain phosphatase |
| BK Channel | : Big potassium channel |
| PKG | : cGMP dependent protein kinase |
| IP3 | : inositol triphosphate |
| mPTP | : mitochondrial permeability transition pore |
| ATP | : adenosine triphosphate |
| PKC | : protein kinase C |
| ROC | : Receptor operated calcium channel |

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Introduction



INTRODUCTION

Contrast-induced acute kidney injury (CI-AKI) is a serious and prevalent side effect of the administration of iodine contrast medium after Coronary angiography or Percutaneous Coronary Intervention procedures.

The European Society of Urogenital Radiology defines contrast-induced acute kidney injury as any of the following (**Kellum J. et al., 2012**):

- Increase in Serum creatinine by more than or equal 0.3 mg/dl within 48 hours.
- Increase in serum creatinine to more than or equal to 1.5 times baseline, which is known or presumed to have occurred within the prior 7 days
- Urine volume less than 0.5 ml/kg/h for 6 hours

CI-AKI incidence ranges from 2-5% in the general population to 50% in high-risk patients (**Cheungpasitporn et al., 2014**).

The risk factors for CI-AKI include diabetes mellitus (which is associated with increased risk even in patients with preserved renal function), congestive heart failure (CHF), age > 75, hypertension, hypotension, decreased renal perfusion, female gender, high-osmolar contrast, contrast volume, urgent versus planned PCI and most importantly, chronic kidney disease (CKD) (**Mehran R et al., 2004**).