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Furosemide- based prophylactic strategies for the prevention of contrast-induced nephropathy: A meta- analysis

Regalado Joseph Justin, Santos-Gonzales and Lourdes Ella
Cardinal Santos Medical Centre, Philippines

Research question: In adult patients undergoing contrast procedures, will furosemide-based prophylaxis, compared with saline, reduce the risk of Contrast-Induced Nephropathy (CIN)?

Background: CIN is the third leading cause of hospital-acquired kidney injury. While hydration is the most accepted prevention, several studies investigated using pharmacological adjuncts. An earlier meta-analysis done for Furosemide did not show significant benefit, but newer studies showed otherwise.

Objectives: This meta-analysis assesses the potential of Furosemide in preventing CIN.

Inclusion criteria: Studies published in English with available full texts were included, irrespective of blinding, based on: Populations older than 18 years, undergoing contrast procedures, and studies that defined CIN as creatinine increase more than 25%, or more than 0.5mg/dL.

Search strategy: Pubmed, Cochrane, and Clinical Key were used to identify all randomized controlled trials (RCT), with human subjects, using furosemide in a contrast procedure. Search terms were “Furosemide”, “Contrast-Induced Nephropathy” and “Acute Kidney Injury”.

Study manoeuvres: Author, procedure, design, furosemide regimen, and CIN incidence were extracted. Subcategories were created for further analysis. A minimum Jadad score of 3 was needed for acceptance.

Statistical analysis: The incidence of CIN was treated as dichotomous variables, expressed as relative risks, with a 95% confidence interval (CI). Calculations were done using the Mantel-Haenszel random-effects model, using Cochrane’s RevMan 5.2.

Results: 6 out of 16 papers were included based on the criteria mentioned (pooled n=1432). Meta-analysis of these trials showed that while the data trended towards a saline regimen, there is no significant difference (95% CI) in incidence reduction, with considerable heterogeneity (81%). Subcategory analysis was done to reduce heterogeneity. While each subplot did not show statistical significance, these showed patterns that suggest future strategies to explore.

Conclusions: A regimen with the best chance of reducing CIN incidence used normal saline, per-kilogram weight hydration, and matched hydration. Pursuing RCT’s similar to the MYTHOS trial, PRINCE trial, and Guo’s study is recommended. With more studies with similar protocols, more conclusive results can be achieved. The limitations of this study include methodology heterogeneity, lack of peer article review, and available research.

Biography

Joseph Justin H Regalado has completed his MD at the age of 23 years from the University of the Philippines, Philippine General Hospital. He is currently in his 2nd year of residency training in Internal Medicine at the Cardinal Santos Medical Centre, Philippines.

justin.regalado@gmail.com