BMC2 Best Practice Protocol

Best Practice Protocol for the Blue Cross Blue Shield of Michigan Cardiovascular Consortium

A Protocol for Prevention of Contrast Induced Acute Kidney Injury

Prevention of contrast induced acute kidney injury (CI-AKI) requires attention to two goals: 1) adequate pre-procedural hydration and 2) renal function based contrast dosing. Pre- Hydration is of most value in patients with abnormal renal function and can probably be omitted in patients with GFR > 60 ml/min/1.73 m^2. Hydration can be considered in two steps, 1) pre-procedure hydration and 2) procedural hydration to be continued post procedure.

The following steps are recommended for prevention of AKI:

1. **Pre-Procedure**
    a. Stop NSAIDs for 24 hours prior to the procedure
    b. Modified NPO orders for cardiac catheterization procedures with conscious sedation (not applicable to patients with delayed gastric emptying)
        i. No fatty food for 8 hours
        ii. No other solid food or milk for 6 hours
        iii. Nothing by mouth for 2 hours
2. **Oral Hydration**
    a. Clear liquids to be encouraged for up to 2 hours before the procedure (at least 500 ml in 6 hours)

b. Drink one glass of water every hour starting 4-6 hours before the procedure and continue till 2 hours before the procedure

c. No oral hydration for patients with decompensated heart failure, severe valve disease or delayed gastric emptying

3. IV hydration

Pre-Procedure Hydration	
• Normal saline 3ml/kg over 1-3 hours • IV pre-hydration may not be necessary if adequate oral hydration • No intravenous pre-hydration for severe valve disease, decompensated CHF	
During/Post-Procedure Hydration	
• Hydrate based on LVEDP as per the POSEIDON protocol • Assume maximum body weight 100 kg • The post procedure hydration should be confirmed in the Post-Procedure Debrief	
LVEDP < 13 mm Hg	5 mL/kg/hr x 4 hours
LVEDP 13 mm Hg to 18 mm Hg	3 mL/kg/hr for 4 hours
LVEDP > 18 mm Hg	1.5 mL/kg/hr for 4 hours

4. Additional Considerations

a. Use clinical judgement to determine post hydration when LVEDP is not obtained. (e.g., moderate/ severe aortic stenosis, mechanical valve)

b. Shorter duration of post procedural hydration (1-2 hours) may suffice in patients who are administered low volumes of contrast (e.g., diagnostic catheterization only) or those with GFR > 60 ml/min/1.73 m2

c. **Renal Function Based Contrast Dosing** There is a non-linear relation between renal function-based contrast dose and the risk of AKI and an approach of as low as safely possible should be applied to contrast volume

   i. Contrast confirm GFR and GFR based contrast volume thresholds (2 X and 3 X GFR) in the procedure time out; aim for contrast volume < 2-3 X GFR

   ii. In high-risk patients, (GFR < 30, or predicted risk of AKI > 7%), consider ultra-low- contrast volume procedure if feasible (contrast volume < 1 X GFR); use IVUS guidance instead of contrast guidance

5. Follow up

a. Serum creatinine should be checked the day following the procedure or at 48 hours in patients at high risk of AKI

b. Patients who develop AKI should be followed till the renal function recovers; appropriate adjustment to pharmacotherapy needs to be considered based on the degree of renal dysfunction that develops

c. While many practitioners hold RAAS inhibitors or SGLT inhibitors in patients undergoing cardiac catheterization; there are no high quality data to support or refute this practice

Footnote: GFR= Glomerular Filtration Rate, LVEDP = Left ventricular End diastolic pressure

Disclaimer

BMC2 Best Practice Protocols are based on consortium-wide consensus at the time of publication. Protocols will be updated regularly, and should not be considered formal guidance, and do not replace the professional opinion of the treating physician.

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