



PIC QUESTION OF THE WEEK: 11/22/2004

Q: Why is a patient undergoing a cardiac catheterization presenting with a prescription for acetylcysteine?

A: Radiographic contrast media (RCM) are incorporated into diagnostic tests such as CT scans, angiography, myelography, etc. There is a direct correlation between the use of these agents and the occurrence of renal dysfunction. RCM are considered the third most common cause of acute renal failure in hospitalized patients. Although the mechanism is not fully understood, two theories currently exist. These agents generate free oxygen radicals that may produce direct tubular injury. An alternative mechanism is renal vasoconstriction mediated by release of endothelin and adenosine. High risk factors include patients with pre-existing renal disease, diabetes, hypotension, heart failure, multiple myeloma, and concurrent drugs that may adversely affect renal function such as NSAIDs. Acetylcysteine is an aerosolized mucolytic agent also used in the treatment of acetaminophen intoxication. The drug's metabolites possess antioxidant properties and serve as free-radical scavengers. This is the apparent basis for acetylcysteine's efficacy in preventing RCM nephropathy.

The recommended acetylcysteine dosage for this indication is 600 twice daily for two days beginning the day prior to the procedure. The 600 mg dose may be administered as 3 ml of the 20% or 6 ml of the 10% solution. Many patients complain of acetylcysteine's strong odor and unpleasant taste. To improve palatability, the dose should be placed in 10 ml of cola or soft drink. There is some suggestion that drinking the solution through a straw will also improve tolerance. Acetylcysteine dilutions should be made fresh and used within one hour of preparation.

References:

- Raven QL, Walton T, Howe AM, et al. Role of acetylcysteine in the prevention of contrast-media-induced nephrotoxicity. *Am J Health-Syst Pharm* 2003;60:2232-5.
- Ferrone M. Pharmacotherapeutic options to prevent radiocontrast-induced acute renal failure. *Formulary* 2004;39:163-85.

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