Clinical Applications of N-acetylcysteine in Non-toxicologic Conditions

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N-acetylcysteine (NAC) is a thiol containing compound. It is deacetylated to cysteine – one of the three amino acids required for glutathione production. NAC has several mechanisms, such as free radical scavenging, increasing of oxygen delivery and mitochondrial adenosine triphosphate (ATP) production, antioxidant effects and alteration of microvascular tone. Hence, NAC alleviates hepatotoxicity from xenobiotics, such as paracetamol, amatoxin containing mushrooms, carbon tetrachloride, chloroform, pennyroyal oil, clove oil, and chronic valproic acid toxicity. Oral and intravenous NAC were approved by the United States Federal Drug Administration (FDA) in 1985 and 2004, respectively.

FDA approved indications for NAC, including paracetamol overdose, administration for anesthesia procedure, atelectasis due to mucous obstruction, acute bronchopulmonary disease, respiratory complication of surgical procedure, adjunctive therapy for pulmonary complications of cystic fibrosis, diagnostic procedure on lower respiratory tract, chronic disease of respiratory system, and tracheostomy care.

There has been an increasing use of NAC for various non-FDA approved indications. This session will demonstrate dose regimens and effectiveness of data concerning NAC administration for acute hepatic injury other than paracetamol overdose and prophylaxis of radiographic contrast agent nephropathy. Controversy regarding use in dermatologic conditions will be discussed.

NAC is considered a safe drug. Common adverse reactions from oral NAC include nausea, vomiting, gastrointestinal discomfort, and diarrhea. Intravenous NAC may cause anaphylactoid reactions, with rate and concentration dependent. It is classified as pregnancy category B.

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