Incidence of adverse drug reactions induced by N-acetylcysteine in patients with acetaminophen overdose

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Abstract
Background: Intravenous N-acetylcysteine (IV-NAC) is widely recognized as the antidote of choice for acetaminophen overdose. However, its use is not without adverse drug reactions (ADR) that might affect therapeutic outcome or lead to treatment delay. Objective: the aim of this study was to investigate the type and incidence of ADR induced by IV-NAC in patients treated for acetaminophen overdose. Methods: This is a retrospective study of patients admitted to the hospital for acute acetaminophen overdose over a period of 4 years (1 January 2005 to 31 December 2008). The primary outcome of interest in this study was the occurrence of ADR during NAC administration. Pearson chi-square test or Fisher’s exact test, student’s t test, and Mann-Whitney U test were used in univariate analysis. SPSS 15 was used for data analysis. Results: Two hundred and fifty five patients were studied. Different types of ADR were observed in 119 (46.7%) cases. Of those patients, 83 (69.7%) had been treated with IV-NAC versus 36 (30.3%) who had not (p < .001). The following ADR were significantly associated with IV-NAC administration: vomiting (p = .001), flushing (p < .001), rash (p < .001), pruritus (p < .001), chest pain (p = .001), bronchospasm (p = .03), coughing (p = .01), headache (p = .001), dizziness (p < .001), convulsion (p = .03), and hypotension (p = .001). ADR were mild in 54 (43.2%), moderate in 17 (13.6%), and severe in 12 (9.6%) patients. There were no ADR in 42 (33.6%) patients. Comparative results of the characteristics of patients who reacted to IV-NAC and non- reactors showed that patients with ADR had no significant difference in age, gender, ethnicity, amount ingested, latency time, and acetaminophen level than nonreactors. Conclusion: ADR to IV-NAC were common among patients with acetaminophen overdose, but mostly minor and all reported adverse reactions were easily managed.

Keywords
acetaminophen, adverse drug reaction, N-acetylcysteine, overdose

Introduction
Acetaminophen (paracetamol) is one of the most widely used drugs worldwide.¹ In therapeutic doses, acetaminophen has an excellent safety profile. However, in large doses, acetaminophen can cause liver impairment.¹⁻³ In fact, acetaminophen overdose is one of the leading causes of liver failure in the western world.²⁻⁴ Acetaminophen remains the most common means of pharmaceutical poisoning in the Eastern world including Malaysia.⁵⁻⁶ Management of patients with acetaminophen overdose includes the use of