H137 Acetaminophen Toxicity Deaths in New Mexico: 1990–2016

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Learning Overview: After attending this presentation, attendees will understand the nature and scope of acetaminophen toxicity in the United States, interventions to reduce it, and specifics about trends of acetaminophen toxicity deaths in New Mexico.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by: (1) providing information on the significance of acetaminophen overdoses in the United States, (2) explaining efforts to reduce acetaminophen toxicity, and (3) discussing trends in acetaminophen toxicity deaths in one statewide medical examiner's office.

Background: Acetaminophen is the most commonly used pain reliever in the United States and is found in more than 600 medications.[1,2] At high doses, acetaminophen is metabolized to N-Acetyl-P-benzoquinoneimine (NAPQI), a hepatotoxin.[1] According to the Acute Liver Failure Study Group, most of the approximately 2,000 yearly cases of acute liver failure are caused by acetaminophen toxicity.[3] At least as early as 1977, the United States Food and Drug Administration (FDA) recognized the potential danger of acetaminophen and recommended that warning labels be added to acetaminophen-containing products.[4] Beginning in 1998 and as recently as 2011, the FDA issued rules and recommendations for labeling and dosing of prescription and over-the-counter drugs with warnings about the dangers of acetaminophen hepatotoxicity.[5-7] However, fatalities involving acetaminophen continue and may have increased between 2000 and 2009.[8]

Purpose: The goal of this project is to study deaths occurring as the result of acetaminophen toxicity in New Mexico to look for overall trends and to determine whether warning label interventions from the FDA affected the numbers of people dying from acetaminophen toxicity.

Methods: This study queried the New Mexico Office of the Medical Investigator's (NMOMI) electronic database for all deaths having acetaminophen in the Cause of Death section from 1990 through 2016. Cases were reviewed for relevance and cleaned in Excel®. Analysis was performed using Statistical Analysis Software (SAS) version 9.4. Categorical variables were compared using either a chi-square test or a Fisher exact test if an expected cell count was less than 5. Continuous variables were compared using a Wilcoxon rank-sum test, or a Kruskal-Wallis for multiple comparisons. P-values of 0.05 or less were considered statistically significant.

Results: Between 1990 and 2016, there were 158 acetaminophen-related NMOMI deaths, with a peak number of cases (18) in 2000. In most cases (98, 62%), acetaminophen was ingested with other substances. Hepatic toxicity was significantly more likely if acetaminophen was ingested alone and if alcohol use contributed to death ($p<0.0001$ for both). Declines in acetaminophen toxicity deaths were not observed in the years following labeling changes for acetaminophen-containing products. American Indians died from acetaminophen toxicity at significantly younger ages than those in other racial/ethnic groups ($p<0.0001$).

Conclusions: There appears to be no connection between labeling changes for acetaminophen-containing products and the number of acetaminophen toxicity deaths.

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