



K67 Manners of Death in Drug-Related Fatalities in Florida

Dayong Lee, PhD*, University of Florida, 4800 SW 35th Drive, Gainesville, FL 32608; Chris Delcher, PhD, University of Florida College of Medicine, 1329 SW 16th Street, Gainesville, FL 32608; Mildred M. Maldonado-Molina, PhD, University of Florida College of Medicine, 1329 SW 16th Street, Gainesville, FL 32608; Jon R. Thogmartin, MD, District Six ME, 10900 Ulmerton Road, Largo, FL 33778; and Bruce A. Goldberger, PhD, University of Florida College of Medicine, Dept of Pathology, 4800 SW 35th Drive, Gainesville, FL 32608

The goal of this presentation is to inform attendees about drug distribution and demographic characteristics associated with manner of death in drug-related fatalities in Florida so as to identify potential risk factors by drug or drug class, age, sex, and race with regard to manner of death.

This presentation will impact the forensic science community by helping to understand drug trends in potentially preventable deaths, identifying populations at greater risk of drug-related deaths, and hence, possibly leading to a more informed development of preventive measures of such deaths.

All drug-related deaths reported to the Florida Medical Examiners Commission through toxicology reports from 2001 to 2012 (n=92,596) were included. A death was considered “drug-related” if at least one drug was identified in the decedent, whether the drug contributed to the death or was merely present. For the purpose of this study, no distinction was made for drug-caused and drug-present deaths. Deaths related to the following drugs or drug groups were reported: amphetamines, benzodiazepines, cannabis, carisoprodol, cocaine, ethanol, γ -hydroxybutyric acid, heroin, inhalants, opioids, phencyclidine, and zolpidem. Manner of death was categorized into five groups: accidental, homicide, natural, suicide, and undetermined. Age cohorts included <18 years old, 18-34 years old, 35-54 years old, and ≥ 55 years old. Race was examined by African American, Hispanic, and White; other races were not included owing to <1% occurrence frequency. Relative risk refers to the category-specific probability of a particular manner of death compared to overall drug-related deaths, using Fisher’s Exact Test for significance testing.

Of all drug-related fatalities from 2001-2012, the most prevalent manner of death was accidental, comprising more than half (52.3%), followed by suicide (19.3%), natural (18.5%), and homicide (7.9%); 2.0% were undetermined. Expectedly, accidents contributed most frequently to drug-related deaths in all age groups (36.7% for ≥ 55 years old to 63.5% for 18-34 years old). Homicide was the second most common manner of death among the decedents under 35 years of age ($\geq 15.0\%$), whereas it was the least frequent for those ≥ 35 years of age ($\leq 6.0\%$). The reverse was true in natural deaths: 9.4%, 4.7%, 19.5%, and 32.6% of deaths of <18 years old, 18-34 years old, 35-54 years old, and ≥ 55 years old, respectively. Similar age disproportion was observed in suicides albeit to a lesser extent: 8.0%, 15.0%, 18.8%, and 26.0% deaths of <18 years old, 18-34 years old, 35-54 years old, and ≥ 55 years old, respectively. Males were significantly overrepresented in drug-related deaths on the whole; however, the proportion of mortality occurrence by manner of death was similar between females and males, except for homicide (5.5% of female deaths vs. 8.8% of male deaths). While accidental death was the most common drug-related death in African Americans (41.9%), Whites (53.5%), and Hispanics (62.3%), the race distribution of other deaths differed; the second most frequent manner of death was homicide for African Americans and Hispanics, but it was suicide for Whites. Proportions of natural deaths were more evenly distributed. Relative risk compared to overall drug-related deaths was >1.2 ($P<0.001$) in accidental deaths for 18-34 years of age; in homicides for <18-34 years of age, African Americans and Hispanics; and in natural deaths and suicides for ≥ 55 -years of age. Yearly proportional changes in the manners of death were generally marginal from 2001 to 2012 in the age, sex, and race groups, except a noticeable decrease in accidental deaths of <18-year-olds from 71.0% in 2001 to 44.7% in 2012. Drug distribution within the overall drug-related deaths showed frequent presence of ethanol, benzodiazepines, cannabis, cocaine, and opioids. Over 1.2 relative risk ($P<0.001$) was observed with alprazolam, carisoprodol, cocaine, heroin, methadone, and oxycodone for accidental death; amphetamines, cannabis, and cocaine for homicide; and diazepam and zolpidem for suicide. While the proportion of opioids in accidental deaths declined in 2011-2012, the opioids still remained as the most prevalent drug group and their proportions in other manners of death were not decreased during the study period.

A high relative risk was associated with age under 35 years for accidental death; age under 35 years, male, and African American/Hispanic for homicide; age ≥ 55 years for natural death; and age ≥ 55 years and White for suicide. Cannabis was significantly associated with homicide. Central Nervous System (CNS) stimulants including amphetamines and cocaine showed high relative risks for accidental death and homicide, whereas CNS depressants including benzodiazepines, carisoprodol, opioids, and zolpidem were more strongly associated with accidental death and/or suicide.

Drug-Related Deaths, Manner of Death, Toxicology

Copyright 2015 by the AAFS. Unless stated otherwise, noncommercial *photocopying* of editorial published in this periodical is permitted by AAFS. Permission to reprint, publish, or otherwise reproduce such material in any form other than photocopying must be obtained by AAFS.