

281. Predictors of severe outcome following opioid overdose in children: a case-control study of a prospective toxicology surveillance registry

Neta Cohen^a, Mathew Mathew^b, Adrienne Davis^a, Jeffrey Brent^c, Paul Wax^d, Suzanne Schuh^a, Stephen B. Freedman^e, Blake A. Froberg^f, Evan Schwarz^g, Joshua Canning^h, Laura Tortora^h, Christopher Hoyteⁱ, Andrew Koons^j, Michele M. Burns^k, Joshua McFalls^l, Timothy J. Wiegand^m, Robert G. Hendricksonⁿ, Bryan Judge^o, Lawrence S. Quang^p, Michael Hodgman^q, James A. Chenoweth^r, Douglas A. Algren^s, Jennifer Carey^t, E. Martin Caravati^u, Peter Akpunonu^v, Ann-Jeannette Geib^w, Steven A. Seifert^x, Ziad Kazzi^y, Rittirak Othong^z, Spencer C. Greene^{aa}, Christopher Holstege^{ab}, Marit S. Tweet^{ac}, David Vearrier^{ad}, Anthony Pizon^{ae}, Kim Aldy^l, Sharan L. Camplemana^{af}, Shao Li^{af} and Yaron Finkelstein^a, On behalf of the ToxIC North American Snakebite Study Group

^a The Hospital for Sick Children; ^b University of Toronto; ^c Department of Internal Medicine, University of Colorado; ^d University of Texas, Southwestern School of Medicine; ^e Alberta Children's Hospital; ^f Indiana University School of Medicine; ^g Washington University; ^h Banner - University Medical Center; ⁱ Rocky Mountain Poison and Drug Center; ^j Lehigh Valley Health Network; ^k Boston Children's Hospital; ^l University of Texas Southwestern Medical Center; ^m University of Rochester Medical Center; ⁿ Oregon Health & Science University; ^o Spectrum Health - Michigan State University; ^p Arkansas Children's Hospital; ^q Upstate Medical University; ^r University of California at Davis; ^s University of Missouri- Kansas City School of Medicine; ^t University of Massachusetts Medical School; ^u University of Utah School of Medicine; ^v University of Kentucky; ^w Atrium Health Carolinas Medical Center; ^x University of New Mexico; ^y Emory University School of Medicine; ^z Vajira Hospital, Navamindradhiraj University; ^{aa} University of Houston College of Medicine; ^{ab} University of Virginia; ^{ac} Toxikon Consortium; ^{ad} University of Mississippi Medical Center; ^{ae} University of Pittsburgh School of Medicine; ^{af} American College of Medical Toxicology

Objective: To explore predictors of severe outcomes (i.e., intensive care admission [ICU] or death) in children who present to hospital with an opioid overdose.

Methods: In this multi-center prospective cohort study of all pediatric patients (0–18 years) presenting to one of 38 sites affiliated with the American College of Medical Toxicology's Toxicology Investigators Consortium (ToxIC), and who received a bedside consultation by the respective medical toxicology service, between August 2017 and June 2020. We collected relevant demographic, exposure, clinical course, disposition, management, and outcome data. Employing a multivariable logistic regression analysis, we conducted a case-control study to explore predictors of severe outcomes. Cases were children who had severe outcome; controls were those without a severe outcome.

Results: Of 165 (87 females, 52.7%) eligible children, 89 (53.9%; "cases") were admitted to ICU or died during hospitalization from hypoxic-ischemic brain injury secondary to respiratory depression (i.e., severe outcomes); 77 (46.1%; "controls") did not experience a severe outcome. Seventy-five children (45.5%) were intoxicated by opioids prescribed to family members. Exposure to fentanyl (adjusted OR = 3.7, 95% CI 1.1 to 11.9; P = 0.02) and age \geq 10 years (adjusted OR 2.0, 95% CI 1.0 to 3.7, P = 0.03) were independent predictors of severe outcomes. Infants up to 12 months of age were more likely than older children to present to the emergency department with severe respiratory depression- bradypnea (86.4% vs. 46.2%, P < 0.01), documented hypoxia (59.1% vs. 23.1%, P < 0.01), and tended to present with lower Glasgow Coma Scale (GCS) score (GCS \leq 8; 51.4% vs. 32.8%, P = 0.057); Infants were more likely to receive naloxone (72.7% vs. 49.7%, P = 0.03).

Conclusions: In children who present to hospital with an opioid overdose, exposure to fentanyl compared with other opioids is associated with an almost four-fold increased risk of ICU admission or death, and age ≥ 10 years with more than double the risk compared with younger children. Intoxicated infants present sicker and are more likely to receive antidotal therapy. Prevention efforts should target those risk factors to mitigate poor outcomes of opioid overdose in children.