Adverse Drug Events and Reactions Managed by Medical Toxicologists: an Analysis of the Toxicology Investigators Consortium (ToxIC) Registry, 2010–2016

Gillian Beauchamp1,2, Marna Rayl Greenberg1, Matthew Meyers3, Matthew Cook1,2, Robert Cannon1,2, Kenneth Katz1,2, Alexandra Amaducci1, Yaron Finkelstein4,5, On behalf of the Toxicology Investigators Consortium (ToxIC)6

1Lehigh Valley Health Network Department of Emergency and Hospital Medicine/USF Morsani College of Medicine, Allentown, PA, USA.
2Lehigh Valley Health Network Department of Emergency and Hospital Medicine, Section of Medical Toxicology, Allentown, PA, USA. 3Philadelphia College of Osteopathic Medicine, Philadelphia, PA, USA. 4Department of Paediatrics, University of Toronto, Canada. 5Department of Pharmacology and Toxicology, University of Toronto, Canada.
6American College of Medical Toxicology, Phoenix, AZ, USA.

Background: Adverse drug events/reactions (ADE/ADR) cost more than $75 billion annually and are among the leading causes of death in the USA. Little is known about patients treated at the bedside for ADE/ADR by medical toxicologists.

Hypothesis: The aim of this study is to review ADE/ADRs reported to the ToxIC registry.

Methods: We reviewed all cases cataloged in ToxIC registry between 1/2010–12/2016. Age was categorized as pediatric (0–18 years), adult (19–65 years) and older adult (> 65 years). Descriptive statistics were used to analyze study variables as appropriate. Chi-square tests and logistic regression were used to assess differences in distribution of study variables by participant age and sex. All analyses were performed with Stata SE v 14.2.

Results: A total of 50,899 patients were identified in the registry: 13,836 (27.2%) were pediatric, 34,133 (67.1%) were adults and 2930 (5.8%) were older adults. ADE/ADRs accounted for 1840 cases, 3.6% of all consults to medical toxicologists. Compared to the 19–65 age group, older adults were more likely to be managed for an ADE/ADR (OR = 4.2, 95% CI: 3.7–4.7). There was a trend for female predominance of ADE/ADR with prevalence in females and males 3.8 and 3.5%, respectively (NS). The most common class of drug associated with ADE/ADRs in the pediatric population was antipsychotics (18.1%); for adults, opioids/analgesics (12.4%); and for older adults, cardiovascular medications (32.1%). Bradycardia was the most reported vital sign abnormality, occurring in 13.2% of the sample, and was more common (OR = 4.9, 95% CI: 3.1–7.7) in older adults compared to younger adults. For ADE/ADRs, the most common medical interventions were Bnone/observation^ (73.2%), pharmaceutical (21.9%) and intubation (5.0%), with no differences by patient se
Discussion: Age-based differences were observed in agents involved in ADE/ADRs: antipsychotics among children, opioids/analgesics among adults up to age 65 and cardiovascular medications among older adults. These differences have potential implications for age-specific prevention and management strategies of ADE/ADRs.

Conclusion: Age-based differences were observed among patients man-aged at the bedside by medical toxicologists for ADE/ADRs, with a strong predominance among older adults.