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DRUG-RELATED US EMERGENCY DEPARTMENT VISITS, 2013-2014

National patient safety initiatives have focused on reducing adverse drug events (ADEs) because they are the most common cause of iatrogenic harm in the healthcare system. However, preventing adverse drug events is challenging due to a variety of reasons (e.g., complex medication regimens, multiple prescribers, and fewer opportunities to monitor therapy compared to hospitalized patients). The purpose of this review was to highlight a recent study that determined the most common ADEs associated with the emergency department visits in 2013-2014. If you need further information, please contact the Center for Healthcare Innovation and Patient Outcomes Research (CHIPOR) at chipor@samford.edu.

Shehab N, Lovegrove MC, Geller AI, Rose KO, Weidle NJ, Budnitz DS. US Emergency department visits for outpatient adverse drug events, 2013-2014. *JAMA*. 2016; 316:2115-2125. doi:10.1001/jama.2016.16201

Introduction

- The Patient Protection and Affordable Care Act of 2010 highlighted adverse drug reaction events (ADE) and national patient safety efforts aimed at reducing ADEs.
- National rates of ADEs are collected and evaluated to provide an overall focus for these safety initiatives.

Methods

- The National Electronic Injury Surveillance System Cooperative Adverse Drug Event Surveillance (NEISS-CADES) project is a public health surveillance system based on a nationally representative sample of US hospitals.
- Hospitals included in the project had a minimum of 6 beds and a 24-hour emergency department.
- Since 2004, between 58-63 hospitals have participated in the project.
- Data abstractors at each hospital reviewed every emergency department (ED) visit to: identify visits associated with ADE; describe up to two medications that may be associated with the ADE; determine concomitant medications used; and evaluate patient's "chief complaint".
- Reports are then coded by the Centers for Disease Control and Prevention (CDC) to describe the events (e.g., diagnosis, symptoms, medication errors).
- Cases were included if their ED visit was associated with consumption of a prescription or over-the-counter medication, dietary supplement, homeopathic product or vaccine product.
- ADEs were classified as an allergic reaction, supratherapeutic effect/excess dose, secondary effects (e.g., choking or injection site reactions), unsupervised ingestion by a child or vaccination reactions.
- Beer's criteria were used to determine potentially inappropriate medications in older adults.
- Estimated proportions of ED visits and hospitalizations, along with corresponding 95% CI, were calculated using SRUVEYMEANS in SAS version 9.3.
- Selected population rates and proportions of ED visits for ADEs in 2013-2014 were compared with estimates from 2005-2006.

Results

- There were 42,585 cases and an estimated 4.0 (3.1-5.0) ED visits for ADEs per 1000 individuals annually in the United States in 2013-2014.
- Approximately 34.5% (95% CI, 30.3%-38.8%) of ED visits for adverse drug events occurred in older adults (aged ≥65 years) in 2013-2014 compared with an estimated 25.6% (95% CI, 21.1% - 30.0%) in 2005-2006.
- Table 1 provides selected ED visits and corresponding ADEs by drug class.

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Table 1: Selected US emergency department (ED) visits for adverse drug events (ADEs) by drug class, 2013-2014

	ED visits for ADEs		ED visits for ADEs resulting in hospitalization	
Drug Class	**No. of cases**	**National Estimate, % (95% CI)**	**No. of cases hospitalized**	**National Estimate, % hospitalized (95% CI)**
Hematologic agents				
Anticoagulants	7211	17.6 (14.1 - 21.0)	3691	48.8 (42 – 55.5)
Antiplatelets	2656	6.6 (4.7 - 8.5)	1312	44.4 (35.7 – 53.2)
Systemic Antimicrobial agents				
Antibiotics	6426	16.1 (14.4 – 17.8)	481	7.1 (5.3 – 9.0)
Hormone-Modifying Agents				
Diabetes agents	5995	13.3 (10.8 – 15.8)	2314	38.5 (31.4 – 45.7)
Central Nervous System Agents				
Analgesics	3412	8.4 (7.7 – 9.1)	878	23.6 (18.7 – 28.5)
Non-opioid-containing analgesics	655	1.4 (1.1 – 1.7)	145	20.0 (12.4 – 27.5)
Sedative or hypnotic agents	1218	3.0 (2.4 – 3.5)	373	28.2 (19.9 – 36.4)
Antipsychotics	1281	2.7 (2.1 – 3.2)	320	25.3 (20.1 – 30.4)
Antidepressants	1045	2.6 (2.2 – 3.1)	193	15.6 (10.9 – 20.4)
Anticonvulsants	1029	2.4 (2.1 – 2.7)	344	30.4 (24.7 – 36.1)
Cardiovascular agents				
Renin-angiotensin system inhibitors	1578	3.5 (2.6 – 4.4)	516	31.9 (23.2 – 40.6)
Oncological and Immunological Agents				
Antineoplastic agents	2007	3.0 (1.6 – 4.3)	1303	59.7 (51.4 – 68.1)
Musculoskeletal agents				
NSAIDs	1199	2.8 (2.4 – 3.2)	174	12.6 (8.7 – 16.5)
Respiratory Agents				
Single-ingredient antihistamines	603	1.3 (1.1 – 1.6)	94	11.9 (6.9 – 17.0)
Cough and cold remedies	533	1.3 (1.1 – 1.5)	58	10.9 (7.7 – 14.1)
Other Drug classes				
Vaccines	916	2.2 (1.7 – 2.6)	43	3.0 (1.7 – 4.3)
Dermatologic agents	458	1.1 (0.9 – 1.4)	23	3.6 (1.1 – 6.1)
Dietary Supplements and Related Products				
Herbals (systemic and topical) and homeopathic agents	488	1.2 (1.0 – 1.4)	60	10.0 (6.4 – 13.5)
Vitamins, minerals, trace elements, and combinations	500	1.1 (0.9-1.3)	69	12.9 (7.3 – 18.5)

- Patients ≥ 65 years experienced more ADEs requiring ED visits with the following agents: warfarin (n=4397), insulin (n=1950), clopidogrel (n=1373), and aspirin (n=1052).

Conclusion

- Approximately 4 per 1000 individuals in 2013 and 2014 visited the ED for adverse drug events in the US.
- The most common drug classes were anticoagulants, antibiotics, diabetes agents, and opioid analgesics.
- Additional educational interventions should be implemented to decrease ADE-associated ED visits.

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Drug-related US emergency department visits, 2013-2014. *CLIPs- Current Literature and Information for Pharmacists.* 2016 December 5;20(12):1-2.