MONITORING ILLICIT SUBSTANCE EXPOSURES THROUGH AUTOMATED SURVEILLANCE SYSTEMS

POISONS INFORMATION SYSTEMS AND DELIVERY

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Objectives: Due to rising concerns from local health departments and law enforcement of a resurgence in synthetic cannabinoid (SC) and heroin use, we established toxicosurveillance methods to obtain timely data of cases within a single poison center through the National Poison Data System (NPDS). Furthermore, with reports of potentially contaminated heroin use, we attempted to identify unique cases by assessing atypical clinical effects associated with heroin use. The purpose of this effort was to identify the frequency, demographics, clinical effects and outcomes through the automated system.

Methods: We generated a case-based alert within NPDS for all human exposures indicating use of SC and heroin between 01 JAN 2015 through 31 JUL 2015. Cases were characterized in a de-identified line listing format that captured key epidemiological and clinical data including pre-defined expected and unexpected clinical effects, which could then be disseminated to public health and law enforcement officials.

Results: *Synthetic cannabinoids*: There were 67 cases (55 males, 82.1%) of SC exposures reported to our poison center over 7 months. Temporally, there were 9 cases in 2015 Quarter 1, 29 cases in 2015 Quarter 2, and 29 cases in July of 2015 Quarter 3. Patients were predominantly 18-25 years (n=33, 49.3%) or 26-35 years (n=13, 19.4%). While 20 cases (29.9%) reported non-specific synthetic cannabinoid use, others reported use of K2 (n=25; 37.3%) or Spice (n=23, 34.3%). The majority of cases (n=52, 77.6%) reported single substance exposures to synthetic cannabinoids, while other cases involved substances such as alcohol, bath salts, cocaine, or opiates. Nearly all cases (n=64, 94.1%) were managed at a healthcare facility, of which 28 (41.2%) were treated/evaluated/released, 14 (20.6%) were admitted to a critical care unit, 17 (25.0%) were admitted to a noncritical care unit, and 3 (4.4%) were admitted to a psychiatric facility. Among the 52 cases reporting single agent exposures, the most common expected clinical effects associated with SC use included agitation (n=26, 50.0%), tachycardia (n=22, 42.3%), confusion (n=10, 19.2%), hypertension (n=9, 17.3%), vomiting (n=9, 17.3%), and seizures (n=8, 15.4%). Most common unexpected clinical effects associated with SC use included drowsiness/lethargy (n=19, 36.5%), hypotension (n=7, 13.5%), bradycardia (n=5, 9.6%), and respiratory depression (n=5, 9.6%). *Heroin:* There were 35 cases (30 males, 85.7%) of heroin exposures, with 6 cases in 2015 Quarter 1, 26 cases in 2015 Quarter 2, and 3 cases in July of 2015 Quarter 3. Patients were predominantly 18-25 years (n=12, 34.3%) or 26-35 years (n=10, 28.6%). All cases were managed at a healthcare facility, of the majority were treated/evaluated/released (n=13, 37.1%) or admitted to a critical care unit (n=15, 42.9%). Of the 35 exposures, 22 were single agent exposures only while others reported a range of substances including (but not limited to) alcohol, opioids, and other illicit substances. Among heroin exposures only, the most common expected clinical effects included respiratory depression (n=12, 54.5%), drowsiness/lethargy (n=9, 40.9%), and coma (n=8, 36.4%). Cases rarely exhibited clinical effects that were inconsistent with heroin exposure.

Conclusions: By automating the system, we generated timely alerts of these substances within minutes of cases being uploaded by our nurses, avoided potential gaps in communication of case details, and bypassed manual querying of data. Monitoring for novel and expected clinical effects observed with synthetic cannabinoids allows us to better identify the similarities and deviations with traditional cannabinoids. Similarly, with the concern of potentially contaminated heroin within our coverage area, systematic review of unusual clinical effects may indicate anomalies by geography. Collaborating with our health departments and law enforcement partners by sharing de-identified data routinely enabled us to demonstrate the significant role of poison centres in identifying emerging public health threats.