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An Outbreak of Exposure to a Novel Synthetic Cannabinoid

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To the Editor

Although early reports of exposure to synthetic cannabinoids described a benign course,[1] with little need for emergency care, on August 24, 2013, patients began to present to Denver emergency departments with severe symptoms after exposure to a novel synthetic cannabinoid known locally as “black mamba.” The Colorado Department of Public Health and Environment (CDPHE) was notified on September 3. Medical toxicologists and CDPHE epidemiologists developed a case definition and began prospective monitoring with assistance from the Centers for Disease Control and Prevention. Records from poison control centers, care providers in nonhospital settings, and law enforcement were reviewed. A total of 263 cases of possible exposure to the synthetic cannabinoid that met the CDPHE definition were identified statewide for the period August 21 to September 19. Among these cases, only 15 had been identified by the state poison control call-in centers.

Among the 263 cases identified, there were 76 patients who presented to the emergency departments at two teaching hospitals in Denver and Aurora. Exposure was confirmed by means of patient history, bedside consultation, or laboratory analyses of products recovered from patients. The majority of cases involved single-agent ingestions; most patients were young men, and symptoms included altered mental status, tachycardia followed by

bradycardia, and seizures (for additional details see the Supplementary Appendix, available with the full text of this letter at NEJM.org). The care of most patients was managed in the emergency department, but 7 patients required admission to intensive care units. The outbreak then ended abruptly; only 10 cases were reported at these two hospitals from September 13 to October 25.

Multiple product brands (Fig. 1) were recovered from patients through a joint effort by hospital staff and law enforcement officials, and a consistent molecule was identified by the Denver Police Crime Laboratory with the use of mass spectrophotometry. The molecule, known as ADB-PINACA (N-[1-amino-3,3-dimethy-1-oxobutan-2-yl]-1-pentyl-1H-indazole-3-carboxamide), was a novel synthetic cannabinoid. We are not aware of any laboratory that can detect ADB-PINACA in blood or urine.

During this outbreak, exposure to ADB-PINACA was associated with neurotoxicity and cardiotoxicity. Although the effects of exposures to first-generation synthetic cannabinoids are largely benign,[1] newer products have been associated with seizures,[2] ischemic stroke,[3] and cardiac toxicity,[4] possibly due to increased potency.[5] Keys to this investigation included the recognition by providers of a novel drug of abuse, coordination with the CDPHE to develop a case questionnaire, and rapid analysis of recovered products. Educational efforts included case management guidelines disseminated by the poison center, public health outreach through local news broadcasts, and informational fliers placed on buses and in the bathrooms of local clubs and bars. Medical toxicologists, public health officials, and law enforcement officials worked together to determine the cause of symptoms, develop the most effective treatment, and limit the distribution of this novel and potentially dangerous synthetic cannabinoid.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1. Representative Sample of Synthetic Cannabinoid Recovered from an Intoxicated Patient