

Recreational Drugs of Abuse

Timothy E. Albertson

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Abstract The use of recreational drugs of abuse continues to expand without limitations to national boundaries, social status, race, or education. Beyond the prevalence of illicit drug use and dependence, their contribution to the global burden of disease and death are large and troubling. All medical providers should be aware of the evolving drugs of abuse and their medical and social consequences. In addition to heroin and stimulants such as cocaine and methamphetamine, new designer stimulants called “bath salts” and cannabinoids called “spice,” along with the abuse of prescription drugs and volatile substances, are now widely recognized problems in many societies. The wide variety and continually expanding clinical manifestations of toxicity of recreational drugs of abuse is not widely appreciated by clinicians. This edition attempts to summarize six major classes of drugs of abuse and their clinical effects with special emphasis on their immunological and respiratory effects.

Keywords Drugs of abuse · Stimulants · Opioids · Marijuana · Cannabinoids · Tobacco · Volatile substance misuse · Alternative tobacco delivery systems · Alternative drugs of abuse

It has been over 16 years since the last issue of this journal was dedicated to a review of recreational drugs of abuse [1]. Significant changes in our knowledge of the clinical manifestations of recreational drugs of abuse have occurred and many

new compounds have been introduced since then. The magnitude of this problem has not decreased but in many parts of the world has increased. Illicit chemists are synthesizing and compounding new designer drugs such as variations of amphetamine and methylenedioxymethamphetamine (Ecstasy) sold as “bath salts” and cannabinoid derivatives sold as “spice” faster than society can make them illegal [2]. Standard clinical laboratory urine and blood drug screenings do not routinely detect most of these drugs so law enforcement and clinicians are often handicapped in evaluating the patient who presents with a new drug of abuse psychiatric, neurologic, cardiovascular, or pulmonary complication. The scale of designer drug (DD) abuse and the risk to public health has been difficult to estimate. A recent report from Poland surveyed adolescents attending high schools, secondary schools, and universities and found that 4.74 % of males and 2.77 % of females had used DDs [3]. Most of the DDs came from shops (57.68 %), friends (31.46 %), and dealers (10.1 %). The users of DDs experienced happy/euphoric mood (57.7 %), talkativeness (42.5 %), and hallucinations (22.8 %); however, 74 % experienced adverse reactions with 4.9 % requiring hospitalizations [3]. The Internet has contributed to the spread and speed with which new recreational drugs are distributed and in many cases before they have been identified or made illegal by authorities [4]. Diversion of amphetamines from the treatment of attention disorders is a major source of stimulants in high schools and colleges. The misuse of prescription drugs such as the newer opioids is recognized as a major medical and social problem.

The extent of illicit drug use and how they contribute to the global burden of disease has recently been estimated [5, 6]. Although the data have limitations and are incomplete, global estimates of cannabis users range from 2.8 to 4.5 % of the world population between the ages of 15 and 64 years [6]. In the same age group, the global estimates of users of opioids are 0.3–0.5 %, of amphetamines is 0.3–1.3 %, and of cocaine is 0.3–1.3 %. The global estimate of 15–64-year olds who

T. E. Albertson (✉)
Division of Pulmonary, Critical Care, and Sleep Medicine,
Department of Internal Medicine, School of Medicine, University
of California at Davis, 4150 V Street, Suite 3100,
Sacramento, CA 95817, USA
e-mail: tealbertson@ucdavis.edu

T. E. Albertson
VA Northern California Health Care System, Mather, USA

inject drugs is 0.37 % but the extrapolated global estimate of people with HIV who inject drugs is 18.9 %. The overlap of HIV and intravenous drug abuse is one of the large contributors along with drug disorders, poisonings, suicide/self-inflicted injuries, and trauma to the disability-adjusted life years (DALYs) attributable to illicit drug use [6]. Illicit drugs contribute an estimated 0.9 %, alcohol contributes an estimated 4.5 %, and tobacco contributes an estimated 3.7 % of all total global DALYs. Together, drugs of abuse and recreation represent a large health care and disability cost.

When estimating the prevalence of methamphetamine/amphetamine, cannabis, cocaine, and opioid use on a national and global level, many different types of databases and survey techniques are used [5]. An interesting new concept in understanding the extent of drug abuse focuses on the analysis of untreated wastewater for drug presence [7]. Using a back calculation formula from 1 to 42 wastewater treatment plants in each country that calculates gram/day per 1,000 inhabitants, the mean cocaine use has been estimated to be 0.43 in Belgium, 1.44 in Ireland, between 1.4 and 1.8 in Spain, 0.62 in Switzerland, 0.53 in Italy, and between 0.3 and 1.2 in UK [7]. These numbers appear to be reasonably consistent with reported yearly illicit drug prevalence data and offer a potential way to monitor for illicit, recreational, and new recreational drug use.

Prevention of illicit and recreational drug use will be multi-factorial and include education, social approaches, and medical and legal interventions. Although pharmacological interventions may help withdrawal and even prevent intravenous drug abuse (like mixing naloxone with oral opioids to prevent intravenous injection), to date little progress has been made. Immunotherapies to thwart drug abuse such as passive and active vaccines against the drugs have been explored in both preclinical and clinical trials. Vaccines targeting cocaine, nicotine, phencyclidine, morphine, and methamphetamine have shown potential [8]. Although these

vaccines have potential, when widely available, they will most likely still be used in combination with a long-term medical and psychological programs to insure the abuser relearns constructive behaviors and control impulse and cravings. In the meantime, the clinician will have to stay alert for new recreational drugs of abuse and recognize their clinical manifestations. This issue of *Clinical Reviews of Allergy and Immunology* offers six papers that provide comprehensive clinical summaries of the effects of the recreational use of stimulants, opioids, volatile substances, alternative recreational drugs, marijuana, and unique delivery systems for tobacco and nicotine.

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