

Synthetic Cannabinoids and Cathinones: Prevalence and Markets

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ABSTRACT: Over the past few years, the phenomenon of new designer drugs has attracted much attention. Synthetic cannabinoids and cathinones are the two main classes of these drugs. Both are potent drugs of abuse, and several cases of severe toxicity and deaths are reported. The present work is based on a systematic review of studies that have assessed the market and prevalence of synthetic cannabinoids and cathinones, and integrates pharmacological, sociological, and epidemiological aspects of these two groups of emerging synthetic drugs. The review reflects that the Internet has made synthetic cannabinoids and cathinones widely available. Furthermore, aggressive and widespread marketing, as well as the low price level of these drugs, their juridical status and their lack of detection on standard drug tests may serve as major motivations for drug use. The number of prevalence studies is small and derived from a limited number of countries. In spite of the many methodological shortcomings, some conclusions may be cautiously drawn. Taken together, the results point toward higher prevalence of use for synthetic cathinones than for synthetic cannabinoids. In the general population, the prevalence of use of synthetic cathinones is reported to be around 4% compared to figures lower than 1% for synthetic cannabinoids. Among students, the prevalence varies from 1–20% for synthetic cathinones and 2–10% for synthetic cannabinoids. Among groups with high rates of drug use, the prevalence varies between 4% to more than 60% for synthetic cathinones and around 10% for synthetic cannabinoids.

KEY WORDS: Consumption, drug market, drug prices, head shops, Internet, legal highs, mephedrone, motives, prevalence, Spice, subjective effects, synthetic cannabinoids, synthetic cathinones.

INTRODUCTION

Over the past few years, the phenomenon of new designer drugs has attracted much attention. Designer drugs' compounds and chemical compositions are created to mimic the intoxicating effects of other well-known illegal substances. To circumvent existing drug laws, producers often make use of noncontrolled ingredients, with the desired "highs" being obtained by applying analogs or derivatives of existing drugs, using modifications of the original chemical structures. These alternative products are neither controlled by international drug conventions nor licensed for legal use [73]. The term "legal highs" is frequently used by market participants when referring to this group of new synthetic drugs, although the term also comprises plants such as kratom (*Mitragyna speciosa*), "magic mushrooms", and salvia (*Salvia divinorum*), all having psychoactive components. More recently, the term "research chemicals" has been introduced to denominate these groups of drugs.

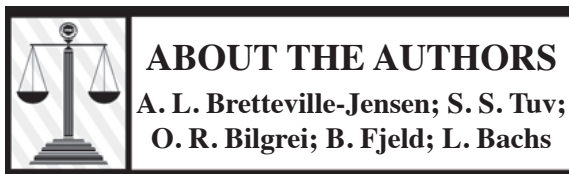
Lately, there has been an increase in the range, potency, profile, and availability of "legal highs". The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) Early Warning System has placed on its radar approximately 164 new psychoactive substances, within the EU, between 2005 and 2011 [20], with global estimations of more than 200 new drugs. Synthetic cannabinoids and cathinones are the two main classes of these drugs, representing two thirds of all new substances reported to the European Early Warning System [20].

Synthetic Cannabinoids

Synthetic cannabinoids constitute a large group of drugs with effects similar to those of cannabis, but which may in fact be considerably more potent. Some synthetic cannabinoids are analogs of Δ^9 -tetrahydrocannabinol (THC), the main psychoactive substance in cannabis; however, most are structurally different [53]. Synthetic cannabinoids exert their effects by acting on cannabinoid receptors in the body, which are part of a complex endocannabinoid system that is not yet fully understood. There are currently two known subtypes of the cannabinoid receptor: The cannabinoid CB₁ receptor, which is located in the brain mostly; and the CB₂ receptor, which is mainly expressed in the immune system. The CB₁ receptor is thought to be one of the most widely expressed G-protein-coupled receptors in the brain, and is believed to play a significant role in the modulation of GABA and glutamate neurotransmission [59]. While THC is a partial agonist on both the CB₁ and the CB₂ receptors, synthetic cannabinoids are typically full agonists on the CB₁ receptor, thus leading to maximum activation, even at significantly lower doses [61,81]. Some synthetic cannabinoids show an affinity for the CB₂ receptor. In addition to having a higher potency than cannabis, some of these drugs also have active metabolites and long half-lives [60].

Synthetic cannabinoids have constituted an area of research since the 1960s, primarily for medical reasons. Due to difficulties in separating anti-inflammatory and analgesic properties from unwanted psychotropic effects,

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