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Cannabinoid Concentrations in Blood and Urine after Smoking Cannabidiol Joints

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Highlights

- Blood/urine concentrations after use of CBD rich/THC low cannabis were investigated.
- Blood THC concentrations exceeded the Swiss Road Traffic Act threshold of 1.5ng/mL.
- THC-COOH accumulation in urine is suspected.

Abstract

In Switzerland, the sale of cannabis with tetrahydrocannabinol (THC) content less than 1% has recently been legalized. As a consequence, cannabis with low THC and high cannabidiol (CBD) values up to approximately 25% is legally available on the market. In this study, we investigated cannabinoid blood and urine concentrations of a naive user and of a modeled chronic user after smoking a single CBD joint. Chronic use was modeled as smoking 2 joints per day for 10 days. Joints contained 200 mg of cannabis with THC concentrations of 0.94% and 0.8% and CBD concentrations of 23.5% and 17% in the naive-smoker and chronic-smoker experiment, respectively. After smoking, blood and urine samples were collected for 4 and 20 hours after smoking start, respectively. THC blood concentrations reached 2.7 and 4.5 ng/mL in the naive and chronic user, respectively. In both cases, the blood THC concentration is significantly above the Swiss road traffic threshold of 1.5 ng/mL. Consequently, the user was legally unfit to drive directly after smoking. CBD blood concentrations of 45.7 and 82.6 ng/mL were reached for the naive and chronic user, respectively. During the 10-day smoking period, blood and urine samples were regularly collected. No accumulation of any cannabinoid was found in the blood during this time. Urinary 11-nor-9-carboxy-THC concentrations seemed to increase during the 10-day period, which is important in abstinence testing.

Introduction

Recently, there has been an increasing interest in cannabinoids for medical applications. Of the many phytocannabinoids, cannabidiol (CBD) has lately been the target of much research as it is non-intoxicating and has potential positive effects on various diseases such as cancer^{1,2}, epilepsy³⁻⁵ and neurological diseases such as Parkinson's or Alzheimer's disease⁶. CBD has been reported to possess mild sedative effects while reducing negative delta-9-tetrahydrocannabinol (THC) effects such as anxiety⁷. The alteration of the THC-

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