Intravenous Kratom Use in a Patient with Opioid Dependence

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Abstract

Kratom, derived from Mitragyna speciosa Korth, has gained popularity as a natural product that can ameliorate opioid withdrawal symptoms. Compulsive Kratom ingestion is well-documented; however, there are no reports in the medical literature of parenteral Kratom use. We report the case of a 29-year-old man who transitioned from oral use to injecting various forms of Kratom. He presented to the emergency department with acute thrombophlebitis at an injection site.

Keywords: Kratom; Mitragynine; 7-hydroxymitragynine; Opioid withdrawal; Injection drug use; Abuse liability

Introduction

Kratom, a natural product with activity at opioid receptors, is available via the Internet without a prescription. Derived from Mitragyna speciosa Korth, a Southeast Asian tree, Kratom has been used for centuries for its dual stimulant and opioid-like properties. For various reasons, its use was banned in parts of Southeast Asia in the mid-20th century; however, because it is indigenous to many areas and culturally engrained, its use has not declined [1]. Increasingly, Kratom leaves and extract are used in the United States for the self-treatment of opioid withdrawal. Little is known about the abuse potential of these forms of Kratom. We report the first case of a patient whose addiction to Kratom escalated to intravenous use.

Case Report

A 29-year-old man with a history of substance use disorder presented to the emergency department complaining of pain in his arms. He reported that he had been purchasing Kratom extract via the Internet and injecting it intravenously several times daily. His last reported use was six hours prior to presentation. He denied using tobacco, ethanol, or illicit drugs. On arrival, he was afebrile with a pulse of 95 beats per minute, blood pressure of 138/82 mm Hg, respiratory rate of 18 breaths per minute, and pulse oximetry of 99% on room air. On physical exam, his cubital fossae were notable for erythema and induration, consistent with superficial thrombophlebitis. There were no “track marks.” He was alert and oriented with a normal mental status without evidence of acute intoxication. His laboratory evaluation was significant for a white blood cell count of 12.1 cells/microliter. He was treated with one minute, blood pressure of 138/82 mm Hg, respiratory rate of 18 breaths per minute, and pulse oximetry of 99% on room air. On physical exam, his cubital fossae were notable for erythema and induration, consistent with superficial thrombophlebitis. There were no “track marks.” He was alert and oriented with a normal mental status without evidence of acute intoxication. His laboratory evaluation was significant for a white blood cell count of 12.1 cells/microliter. He was treated with meprobamate, tramadol, and diphenhydramine to ameliorate his withdrawal symptoms.

Discussion

Kratom products are available as raw leaves, powder, chewing gum, extracts, and capsules. The leaves are oval, dark green, and approximately 1-2 cm in size. The central vein of the leaves may be either greenish-white or red, with reports of increased potency in the red-veined leaves [2]. The leaves are typically smoked or brewed into tea. Effects and duration are dose-dependent, with stimulant effects predominating at lower doses (few grams of dried leaves) while higher doses (10-25 grams dried leaves) result in sedation, dysphoria, and euphoria. Symptoms begin 5 to 10 minutes after consumption, and last one to six hours following exposure [2,8].

Of note, while Kratom use in Southeast Asia has traditionally been limited to tea or chewing leaves, more recent reports include...
use of “4 × 100” a Kratom cocktail popular with young adults [9]. The cocktails consist of Kratom leaves, a caffeinated soft drink, and codeine or diphenhydramine containing cough syrup. This parallels the development of similar codeine containing cocktails in the United States, although current reports are limited to Southeast Asia.

Among the dozens of alkaloids identified in Kratom, mitragynine and 7-hydroxymitragynine are considered to be most responsible for Kratom’s opioid-like effects [10]. Additionally, mitragynine acts at supraspinal mu- and delta-opioid receptors, stimulates post-synaptic alpha-2 adrenergic receptors, and blocks stimulation of 5-HT_{1A} receptors [11]. Adverse events associated with the ingestion of Kratom include seizures and hepatic injury [12-14]. Deaths associated with Kratom have been associated with contaminated products or coingestants [9,15-18].

We did not detect mitragynine in the patient’s urine, despite his reported last use of intravenous Kratom six hours prior to his emergency department visit. At that time, mitragynine and 7-hydroxymitragynine were not included in the library of substances able to be detected by our institution’s comprehensive urine drug screen by GC/MS. Likewise, a mitragynine-specific assay such as High Performance Liquid Chromatography (HPLC) was unavailable to us at the time of the patient’s original presentation, as was LC-MS/MS, the analytical technique previously described for identifying mitragynine and congeners [14].

Addiction to Kratom has been well described. The withdrawal syndrome among chronic Kratom users parallels opioid withdrawal, with irritability, yawning, rhinorrhea, and diarrhea [8]. A more contemporary case report described a patient with “anxiety, restlessness, tremor, sweating and cravings for the substance” after discontinuing Kratom use [19]. Cross-tolerance between opioids and Kratom has been described.

Our patient spontaneously self-reported features of tolerance, dose escalation, functional decline, and withdrawal in the setting of chronic Kratom use. Additionally, his usage pattern changed from oral Kratom use to intravenous Kratom use with a prepared extract to direct injection of extract. His emergency department presentation with superficial thrombophlebitis directly stemmed from complications of his Kratom addiction. It is unclear if risk of Kratom addiction is increased in patients with prior substance use disorders, however this case is an important reminder of the chronic nature of opioid addiction, which has a high rate of relapse. As Kratom becomes more popular in patients seeking abstinence from opiates, including heroin, such intravenous use may also increase.

**Conflicts of Interest**

Authors AL, MZ, JH, BB, and JC declare that they have no conflict of interest. Authors EB and KB provide medicolegal consultation and receive royalties from UpToDate. Author EB also participates in NIH-funded research on drugs of abuse.

**Reference**
