



Case report

Kratom instrumentalization for severe pain self-treatment resulting in addiction – A case report of acute and chronic subjective effects



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ABSTRACT

Background: Kratom is a Southeast Asian plant, which is widely used in this region, and making an increasing appearance in Europe and the US.

Case report: We present the case of a 26-year-old man in Substitol-assisted treatment of excessive Kratom and Tilidin use expressing the wish for a drug-free management of a chronic pain condition. After an accidental calcaneus impression fracture, the patient was suffering from severe chronic pain and anxiety of further accidents. This was managed initially with Tilidin. Resulting from the wish to self-manage the pain condition in a way that permitted continuation of a job, the patient searched for a 'natural' treatment alternative obtained from an Internet vendor. He successfully instrumentalized Kratom for 3 years with daily consumption intermixed with occasional Tilidin for pain management. However, the dose of Kratom was increased considerably up to a level of effect reversal, when no analgesic and behaviorally activating effects occurred any more, but only intense drowsiness. The patient was treatment seeking and subsequently detoxified from Kratom and Tilidin. Pain management was shifted to retarded morphine.

Conclusion: Kratom instrumentalization for pain management might appear to be more problematic for addiction development than when its use is established for other consumption motives.

1. Introduction

Drug instrumentalization describes the use of a psychoactive drug by a non-addicted individual in order to better reach non-drug related goals in life (Müller and Schumann, 2011a, b; Ahmed et al., 2020). Many consummatory episodes of psychoactive drugs do not take place by addicted individuals or for the euphoric and immediate rewarding effects of the drug, but because psychoactive drugs can effectively improve other rewarded behaviors (Müller, 2020). Drug instrumentalization goals, otherwise known as consummatory motives, may include the improvement of social interaction, improved cognitive performance or better work performance (Müller and Schumann, 2011a, b). Here we present a case where also the self-management of a severe pain condition with the aim to continue a cognitively demanding job and active social life, serves as a primary instrumentalization goal that motivated drug consumption.

Kratom is a Southeast Asian plant of which the leaf products are widely used in this region with numerous instrumentalization goals reported (Hassan et al., 2013, 2017); including enhanced work performance and better socializing, but also to manage self-withdrawal from opiate use

(Singh et al., 2019a). It has only weak euphoric effects in the dose range humans voluntarily use (Singh et al., 2019b) and is not associated with neurological or psychiatric deficits and addiction development in the vast majority of regular users in Malaysia (Singh et al., 2015, 2018a; 2018b; Leong Bin Abdullah et al., 2019). However, in preclinical studies we showed that its main alkaloid mitragynine can at high doses have reinforcing effects and induce addiction-like behavior with adverse cognitive effects in rodents (Yusoff et al., 2016; Ismail et al., 2017; Hassan et al., 2019). These effects are partly mediated by an opiate-like mechanism (Stolt et al., 2014; Yusoff et al., 2017; Obeng et al., 2020), but may also involve other targets in the brain (Yusoff et al., 2018; Hiranita et al., 2019). Nonetheless, mitragynine can also attenuate morphine intake (Hemby et al., 2019) and reduce withdrawal effects in rats (Hassan et al., 2020).

Long-term effects of Kratom arising from chronic use may lead to withdrawal symptoms upon cessation. Those include hostility, aggression, excessive tearing, inability to work, aching of muscle and jerky limb movements (McWhirter and Morris, 2010; Singh et al., 2014; Suhaimi et al., 2016). Chronic consumption was also reported to lead to anorexia, weight loss, and insomnia. Cognitive performance can be impaired

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(Apryani et al., 2010), in particular episodic memory and new learning (Singh et al., 2019c). In rare cases, confusion and delusion, as psychiatric symptoms, were reported (Sheleg and Collins, 2011). However, many of these symptoms may arise from long-term co-consumption with other psychoactive drugs (McWhirter and Morris, 2010; Havemann-Reinecke, 2011).

2. Method

We investigated a treatment-seeking patient with a chronic and intense pain condition who reported excessive Kratom use and analyzed his instrumentalization goals in relation to his life history.

3. Results

The patient was a 26 year old male German (height: 1.67 m, weight: 61.4 kg) who was treatment-seeking with the goal to abandon his previous high intensity consumption of Kratom and Tilidin. He was single and still living in parental household with his father and sister after the divorce of the parents at the age of 12.

3.1. History

The patient had 10 year of school education and thereafter successfully completed two job trainings as an electromechanical plant fitter and IT specialist. He worked as an IT systems administrator. With the age of 23, he incurred a complicated calcaneus impression fracture in a car accident, which did also after several surgical interventions and orthopedic and psychosomatic rehabilitation not completely recover, but resulted in a chronic severe pain condition. This condition, when untreated prevented him from work in his job and from social activities. Even after functional recovery, which left no visible impairments in walking, it rendered the heel vulnerable to further injury and induced anxiety for intensified pain together with a depressed mood condition.

3.2. Drug history

At the age of 14, he started smoking tobacco and marijuana until the age of 17. In this period, he also tried several other drugs like cocaine, benzodiazepine, methamphetamine, and amphetamine. Later on in his adolescence, he only consumed alcohol in a moderate way. After his car accident, he stopped drinking completely and started Tilidin and Kratom use.

3.3. Treatment

The heel injury was initially treated with Tilidin (100 mg per day) for 2 month. Then the patient stopped the analgesia treatment for 3 month before resuming it. This on-off pattern of Tilidin treatment was continued for approximately two years, before the patient started to search for a non-synthetic, 'natural' treatment alternative, which may not undergo analgesia tolerance development. Being familiar with Internet search and web-based supply, the patient discovered the Southeast Asian plant Kratom (*Mitragyna speciosa* Korth), which is easily available via Internet and a legal alternative for self-treatment in Germany.

3.4. Kratom instrumentalization

In order to reduce Tilidin consumption and achieve sufficient pain treatment to continue the job and social activities, the patient started Kratom consumption. He ordered up to six different specimen types of powdered Kratom plant products (e.g. Thai Pimps) from an Internet vendor where it was reliably available. The Kratom product was sold as Kratom herbal preparation that should not contain any synthetic additional compounds. However, several spontaneous saliva multi target screenings by LC-MS/MS by a physician during this period found besides mitragynine (1.7 ng/ml, cutoff: 1.0 ng/ml) also hydromorphone in trace

amounts (0.11–0.46 ng/ml, cutoff: 0.1 ng/ml). Thus, adulterations of commercially available Kratom cannot be excluded in this case, as it was also previously reported (Lydecker et al., 2016). The patient self-manufactured pills from the Kratom powder to have a storable reserve. This preparation also allowed convenient consumption outside the home when needed. The consumption pattern was initially four times per day Kratom powder orally ingested with daily dose of 4 g. This dose achieved very good analgesic effects that were comparable with those of Tilidin (2-3 x 100 mg per day) with initially little Kratom tolerance development. Kratom was successfully used in that the patient was able to self-medicate the pain problem and resolve emotional problems related to it. Despite chronic severe pain, he achieved a status where he could continue a fulfilling job and maintain social activities. As such, the individual instrumentalization goals of pain management and drive-enhancement can be identified for the Kratom use. Furthermore, the self-medication and repeated dosing allowed for fine adjustment of the Kratom effects according to daily variance in pain and mood status. This pattern of daily Kratom consumption continued for ca. three month, during which a tolerance development for analgesic effects was overcome by an increase in daily consumption of up to 30 g/day Kratom powder. Thereby, the patient changed the specimen of Kratom on a daily base with slight adjustments of dosage between sorts. The calibration of the day's total dose was done after perceiving the effects of the first dose of the day. At the late stage of consumption, Kratom acquisition required a financial effort of 300–400 €/month.

After approximately three month of Kratom and occasional Tilidin self-medication, the high dose of Kratom lost its beneficial instrumentalization effects as it now started to induce fatigue and drowsiness and rather prevented the patient from work and an active life style. When recognizing this, the patient abandoned the consumption for ca. 3 month, which he achieved without help, but resumed it thereafter. After about three years on-off Kratom consumption, he finally faced problems with controlled abstinence from Kratom and Tilidin. However, he recognized this as a critical situation and searched for professional medical help.

3.5. Kratom acute effects

The patient described the acute effects of a single dose of Kratom: about 30 min after oral ingestion, a warm feeling was perceived followed by a mild euphoria and analgesic effects. A subjective feeling of increased fitness and physical activity emerged with drowsiness disappearing. These effects reached their peak ca. 45–60 min after intake, before they slowly declined over the next 2 h. Then rushes of drowsiness were perceived. A single instrumentalization episode lasted about 3–4 h. Then, the next single dose of the same Kratom specimen was self-administered with an adjustment of the dose according to the match of desired analgesic effects after the first dose of the day. Dose adjustments were reported according to general mood status in the morning, physical status (e.g., catching a cold), and some environmental influences (e.g., bad weather), which usually required higher doses. Adverse physical effects of Kratom included a weakening of gut motility and digestion leading to temporal constipation. This was compensated by enhanced consumption of caffeine (café drinking).

3.6. Kratom-drug interactions

The patient reported numerous interactions of Kratom effects with other psychoactive substances. Caffeine (café drinking) as well as Ibuprofen [(RS)-2-(4-(2-methylpropyl)phenyl)propanoic acid, a nonsteroidal anti-inflammatory drug] boosted the acute effects of Kratom. In turn, Kratom enhanced the desire to smoke nicotine.

3.7. Kratom long-term effects

The end of a Kratom consumption episode was usually followed by drowsiness, which appeared to be an acceptable side effect, especially

when emerging in the evening after the instrumentalization goal of the day was reached before. Long-term use of Kratom changed the emotional status of the patient, which he recognized himself. It led to a dulling of bodily perceptions and emotional reactions to environmental stimulation and social interactions, and finally social withdrawal. In particular, music perception and production no longer induced positive feelings and led to abandoning of this spare time activity.

3.8. Kratom effect reversal

Kratom instrumentalization ended with the perception of an effect reversal. At the high dose regimen of self-administration, a single dose Kratom had no more analgesic effect, but induced strong fatigue. This led to the wish of temporary abandoning of consumption. While this was still possible for the patient, the chronic dulling effects faded out and the acute analgesic effects were re-acquired. However, when the patient became unable to voluntarily abstain from Kratom consumption, no such reversal emerged.

3.9. Treatment and present condition

After admission for treatment, the patient underwent a qualified detoxification and withdrawal from Kratom and Tilidin in a clinical setting. Pain management was successfully switched to Ibuprofen and Metamizol-Natrium if required. At that stage, the patient did not report craving for Kratom or concern for relapse.

4. Discussion

Here we present a patient that reported a development of an addiction like pattern of Kratom consumption out of an initially successful instrumentalization of the drug with the goals of pain management and drive-enhancement in a chronic condition of severe physical pain. Thereby, the drug was not consumed for recreational purposes or euphoria and enjoyment, but with the clear intention to overcome an acquired aversive condition for which currently no other than pharmacological help was available. As such, this case suggests that the list of practical instrumentalization goals for psychoactive substances (Müller and Schumann, 2011a, 2011b; Müller, 2020) has to be expanded by the self-management of chronic painful conditions.

Numerous studies from Malaysia and Thailand suggested a low addiction risk and only few chronic adverse effects even after chronic consumption of Kratom (Singh et al., 2014, 2015; 2018a; Hassan et al., 2017). An initial analysis of instrumentalization goals yielded primarily an enhancement of work power and socializing behavior. This was, however, not associated with tolerance effects and an escalation of the Kratom dose or intake frequency. In field studies, typically only few users participate with chronic severe pain conditions. As such, this instrumentalization goal may also be prevalent in Southeast Asian traditional consumption, but emerges only to a small extent in field studies with rather strict inclusion criteria. In Southeast Asia, Kratom is usually chewed or ingested as a brewed preparation from fresh plants (Vicknasingam et al., 2010; Singh et al., 2015). In contrast, available preparations via the Internet usually come as dried herb or powder, and may contain the psychoactive alkaloids in very variable amounts. Differences in addiction potential may partially derive from a lack of social control in settings that are not historically accustomed to Kratom users (Hassan et al., 2013).

A limitation of this report is the individual nature of the consumption setting, in that Kratom is not consumed for the wide spread instrumentalization goals of recreation or work performance enhancement, but for pain self-medication. However, several case studies confirm a problematic use of Kratom as a pain self-medication in the context of opiate (Boyer et al., 2007; Singh et al., 2020) or alcohol self-withdrawal (Havemann-Reinecke, 2011). Some large-scale studies also suggest a rather successful, i.e. a little problematic use of Kratom for pain

self-treatment in the U.S. (Grundmann, 2017; Garcia-Romeu et al., 2020) or in a randomized, placebo-controlled study in Malaysia (Vicknasingam et al., 2020). They also support the observation of differentiated motives for Kratom consumption. The present report may add evidence for the view that this particular Kratom instrumentalization goal is more problematic than the other goals where little addiction development was reported (Singh et al., 2014, 2019b; Prozialeck et al., 2019).

Consent

Written informed consent was obtained from the patient for publication of this case report.

Declarations

Author contribution statement

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Competing interest statement

The authors declare no conflict of interest.

Additional information

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