

Drug Abuse of Modafinil by a Cannabis User



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Dear Editor,

Although Tetrahydrocannabinol (cannabis - THC) dependence is not as severe as that due to other illicit substances such as heroin or cocaine, it poses a problem in transition to the use of other illicit substances¹. THC has many adverse effects leading to progressive deterioration in memory, attention, motivation and interpersonal relationships. Nowadays, an effective drug therapy for cannabis dependence is not available and behavioral treatments are only moderately effective. Impairment in attention, memory, and executive functions, in addition to fatigue, and difficulties with motivation especially experienced during chronic use of THC create problems for users². To overcome this situation, users and physicians occasionally try to employ some therapeutic modalities. Modafinil, which can be used for this purpose, has been approved as a wakefulness promoting drug for the treatment of narcolepsy, shift work sleep disorder, and obstructive sleep apnea syndrome³. In addition, it has been used as an off-label drug for cocaine addicts⁴, and favorable effects have been noted⁴.

We decided to write this report after our observation of a 20-year-old male patient, who was directed to us by the Probation and Parole Office. The patient stated that he had been using THC for approximately 6 years, and he had become constrained and irritable when he didn't use it. The patient stated that he had been using THC regularly, and had not stopped using it for more than a month, and had not received any treatment for this purpose. The patient who started his military service 4 months ago,

expressed that he had been using THC despite constrained conditions, but decided to stop using it. The patient indicated that during this THC withdrawal period, he had experienced episodes of fatigue, weakness, nervousness, impaired attention, and concentration abilities, and consulted us because of these complaints. Psychiatric examination of the patient revealed an euthymic mood, and affect. Conditions related to his general health state were ruled out. There were some incision scars and tattoos on his body. He stated that he had been previously involved in criminal events, but he had not been jailed. The patient had antisocial personality traits. Diagnosis of early partial remission of THC-related substance abuse was made according to DSM IV TR criteria.

After he received psycho-educational counseling about the deleterious effects of THC, he was started on modafinil 100 mg/day orally for his complaints such as fatigue, weakness and decreased concentration ability. The patient was seen nearly a month later, and he stated that he had stopped using THC during this time interval, but his desire to smoke THC was enhanced after modafinil intake. In addition, he stated that the drug made him nervous, and he felt like using THC. The drug had also increased his fits of laughter, and all of these symptoms urged him to discontinue the drug. He also indicated that after discontinuation of modafinil, all of these symptoms were relieved, and he didn't want to use the drug anymore.

Although the mechanism of action of modafinil is not fully understood, it has been demonstrated that it increases glutamate, but decreases GABA

release⁵, and inhibits the activities of dopamine and norepinephrine transporters with resultant increases in the intracellular levels of both agents⁶. This rewarding effect of modafinil on dopamine releasing activity of the nucleus accumbens is comparable to that of THC⁷.

In a study, which was the first among those performed on non-addict occasional THC users, 12 participants received 15 mg THC and 400 mg modafinil, and at the end of the study the authors concluded that modafinil was a safe drug for THC users. In this study favorable effects of modafinil on some cognitive parameters were demonstrated⁸. Because of the small number of participants who were occasional THC users at low doses, adverse or unexpected effects of modafinil were not evaluated significantly.

Modafinil has become quite popular recently. Although it has been approved as a wakefulness promoting drug for the treatment of narcolepsy, shift work sleep disorder, and obstructive sleep apnea syndrome, it is frequently administered as an adjunctive therapy in psychiatric patients with progressive attention, and concentration deficits⁹. However owing to our above-mentioned reasons, thanks to its favorable effects on feelings of craving especially experienced by cocaine addicts, its use seems to be preferred for this indication. Although beneficial effects of drugs and substances in this field cannot be denied, their potentially pleasurable, stimulatory and sedating

effects, as well as arousal of feelings urging individuals to undergo weird, and atypical life experiences can lead to substance abuse. As far as we know, cases of drug abuse have not been encountered very often among modafinil users in our country. As psychiatrists, we of course care about the treatment of our patients, but sometimes we can especially lose the risk/benefit balance in writing a prescription for a controlled substance. Sometimes these prescribed drugs can replace the substance used by abusers. Despite their beneficial effects seen in occasional THC users⁸, unwanted effects of modafinil might occur in regular users, and dependents probably due to individual variations in neurochemical responsiveness and receptor sensitivities. Since we have only one case in question, unique individual characteristics of the patient, and a number of unrevealed neurochemical events prevent the formulation of an assertive approach. As mentioned above, due to modafinil's mechanism of action and that the rewarding/pleasure-inducing effects of the drug resembles to those of THC, larger scale studies should be conducted on this issue, especially among THC addicts.

Best Regards.

Keywords: depression, schizophrenia, drug therapy, treatment-resistant, ketamine, nitroprusside

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