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Letter

Could modafinil be a drug of dependence?

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Modafinil is a novel, nonamphetamine-based wake promoting medication approved for narcolepsy and obstructive sleep apnoea. Owing to its activating and cognitive enhancing effects, there is an expanding list of off-label use, including the treatment of methamphetamine and cocaine withdrawal. Although modafinil was previously thought to be nonaddictive (Jasinski, 2000),we present a possible case of modafinil dependence.

Mr A is a 23-year old man prescribed modafinil 200 mg for 6 weeks as an adjunctive treatment for daytime hypersomnolence and fatigue following methamphetamine withdrawal. The patient was admitted 6 months later with a methamphetamine-induced psychosis. It was discovered Mr A had also been abusing modafinil at a self-increased dose of 400 mg daily. His psychosis resolved and modafinil was to be ceased owing to lack of evidence in the long-term treatment of methamphetamine withdrawal. Mr A became extremely agitated regarding the planned cessation. He stated that since commencing modafinil, his chronic methamphetamine use had decreased significantly from daily to episodic use. He spoke positively about modafinil helping him concentrate, feeling energised and becoming more productive. Mr A's accounts were contrary to the history provided by his parents, who attributed his daily modafinil use as the cause for his recent difficulties in social and occupational functioning. Following protracted discussions, Mr A reluctantly agreed to cease modafinil and did not experience any withdrawal symptoms.

In our opinion, Mr A satisfied the DSM 5 criteria for substance abuse disorder as highlighted by his psychological craving, unwillingness to cease use, social and occupational impairment, risky use, self-initiated increase in dose and continued attempts to source modafinil. Our literature search identified only one report of modafinil dependence in a patient with schizophrenia taking supratherapeutic doses of 2000 mg daily for 12 months (Kate et al., 2012). At a neurobiological level Volkow et al. (2009) demonstrated that modafinil exhibited a dose-dependent inhibition of dopamine transporters. This action reduces reuptake of dopamine and increases synaptic dopamine concentrations, particularly within the nucleus accumbens, an essential component in the biological pathway of addiction.

This case highlights the potential of modafinil to be a drug of dependence. On this basis, clinicians should adopt a cautious approach when prescribing modafinil, especially in patients with a known history of substance abuse problems. Further clinical and basic science research is warranted focusing on its potential for abuse and dependence.

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