

A Manic-like Psychosis Due to Khat (Catha edulis Forsk.)

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ABSTRACT

A case is presented of a 23-year-old male who displayed symptoms of manic psychosis and increased sympathetic activity following ingestion of khat (Catha edulis Forsk.). The causal role of khat was verified by visual inspection of the plant and chemical identification of phenylpropanolamine in the urine. The active constituents and possible abuse potential of khat are discussed.

INTRODUCTION

The bush-like plant Catha edulis Forsk., or "khat," has been grown for centuries in parts of eastern Africa and southern Arabia, including Ethiopia, Tanzania, Kenya, and North Yemen. Its somewhat fleshy pinnate leaves are chewed by millions of inhabitants of these countries for its ability to produce euphoria, combat fatigue, and reinforce group interactions in social gatherings [1, 2]. Khat induces amphetamine-

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like sympathomimetic and central stimulant effects in users, such as elevated blood pressure, mydriasis, hyperthermia, anorexia, insomnia, increased arousal, elevated mood, and hypertalkativeness [1, 2]. Socio-medical problems attributed to khat usage include decreased economic productivity, family instability, reactive depression (upon cessation of use), malnutrition, gastritis, cerebral hemorrhage, myocardial insufficiency, spermatorrhea, and impotence [3-5].

Reports of toxic psychosis secondary to khat usage are extremely rare [1]. In this report the authors describe a case of manic-like psychosis caused by khat ingestion which is, to our knowledge, the first such case reported in the United States.

CASE REPORT

A 23-year-old male North African college student was brought to a hospital clinic by his female companion. His companion stated that for the past 3 h he showed increasingly disturbed behaviors consisting of hyperactivity, pacing, shouting, rapid speech, and demands for sexual activity from her. The patient admitted to these behaviors, and also complained of dizziness and thirst. Both the patient and his companion denied any recent usage of illicit or prescribed drugs. (Specific questions about stimulant drugs, such as amphetamine and cocaine and over-the-counter diet and cold medications, were denied.) There was no history of prior psychiatric illness.

Physical examination showed bilateral mydriasis, fine tremor of the upper limbs, brisk deep tendon reflexes, and a twitch over the left eye. Temperature was 99.2°F, pulse 125, and blood pressure 150/100.

Mental status examination revealed the following. The patient presented as an appropriately dressed young man of average build who displayed rapid, pressured speech, and hostile, potentially violent behaviors. He threatened to assault the nurses and sue an orderly. He assumed stiff fighting postures during the physical examination. His affect was labile, varying between euphoria and anger. When asked how he felt he said, "Just super!" Stream of mental activity showed flight of ideas and tangential thought processes. Grandiose delusions were present: he described a plan to create an army of women to retake Arab land from Israel and elaborated on his special knowledge of Israeli weaknesses. He was oriented to time, place, and person. Testing of abstract thinking revealed bizarre responses related to his grandiose thinking. For example, when asked similarities between an "apple, pear, and orange," he spoke of Israeli soldiers stealing Haifa oranges, an act he would avenge. He refused to perform mathematical calculations. Routine laboratory tests—CBC with differential, SMA-18, urinalysis—were normal. A drug screen of the urine was ordered but not immediately available.

The patient and his companion were questioned carefully a second time regarding possible drug use and the woman finally admitted that

she observed him chew "about 2 dozen leaves" of a house plant within 1 h prior to the onset of his disturbed behavior. She revealed that this was the patient's first usage of the plant, which he had grown in his home for several months. She was asked to obtain the plant for identification. This was done and it was positively identified as khat by Drs Rashid Abdu and Ziad Blaik, both of Mideastern background and experienced in botany.

The patient's symptoms abated within 5 h after initial examination. He was observed in an emergency room setting for 12 h, remained symptom-free, and then discharged. Follow up visits at 1 and 3 weeks following discharge revealed no recurrence of symptoms or residual effects.

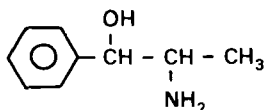
The original urine drug screen was positive for phenylpropanolamine (gas chromatography method) and negative for all other drugs tested.

DISCUSSION

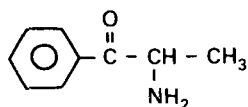
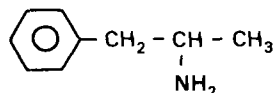
The symptoms in this patient are characteristic of those seen in manic psychosis, and a similar presentation, i.e., elevated mood, hypertalkativeness, and grandiose thinking, has been reported following khat usage in the world literature [2-4]. The occurrence of this psychotic reaction is interesting in view of the extremely infrequent reports of khat-induced psychosis in Mideastern countries [1]. The reasons for this are probably at least twofold. First, the customary patterns of usage in these countries tend to limit the amount of drug used daily [2]. For example, in North Yemen a fixed amount and duration of usage takes place in social settings or "khat sessions" [2]. Second, khat chewing is an accepted practice in Mideastern countries and thus it is done in a social context which gives positive reinforcement and meaning to the experience [2]. In contrast, the patient presented here took a moderately large amount of khat in a short period of time and in a setting clearly lacking social sanction and support.

A toxic, manic-like psychosis and increased sympathetic state can be caused by amphetamines and other sympathomimetic agents: cocaine, phenylpropanolamine, phenmetrazine, methylphenidate, and diethylpropion [6]. Phenylpropanolamine is widely available in over-the-counter cold and appetite suppressant preparations and prescription drugs, and is a relatively more common causative agent of amphetamine-like sympathetic [7] and psychotic [8] reactions. Thus intoxication with these agents should be considered in the differential diagnosis of a patient presenting with a symptom picture as in the present case.

The fresh leaves of the khat plant contain three major compounds isolated from the phenylalkylamine fraction: cathine [(+)-norpseudoephedrine or phenylpropanolamine], cathinone [(-)- α -aminopropio-



cathine [(+) - norpseudoephedrine]

cathinone [(-)- α -aminopropiophenone]

amphetamine

FIG. 1. Structural formulas of cathine, cathinone, and amphetamine.

phenone], and (-)-norephedrine [9, 10]. The close resemblance between cathine, cathinone, and amphetamine in chemical structure is illustrated in Fig. 1. Cathine, which was identified in 1930 [11], was for a long time considered to be the only active stimulant in khat [10]. In 1975, cathinone was isolated [12]. It is a ketone congener of cathine and many investigators now believe that it is the main active principle responsible for the stimulant properties of khat. Supportive of this are studies showing that cathinone strongly resembles amphetamine (compared to cathine) in producing anorexia [13], hypermotility [14, 15], stereotyped behaviors [15, 16], ipsilateral circling behavior in unilateral substantia nigra-lesioned animals [17], suppression of operant behavior [16], and release of striatal dopamine [17, 18].

The presence of phenylpropanolamine in the urine of the patient presented here is consistent with khat intoxication since our methods were not sufficiently sensitive to detect cathinone or distinguish it from phenylpropanolamine.

The pleasant euphoriant effects of khat and the fact that it is easily grown in a household environment suggest that khat usage may spread and become a problem in the Western world. The clinician should be alert to the possibility of khat intoxication in any patient presenting with manic-like behaviors and abnormally increased sympathetic activity.

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