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Review Article

Health Problems among Khat Users

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Abstract

Khat can be characterized as a green plant that belongs to the family of Celesterece. Khat"s is commonly different in terms leaf color, size and the plant height. The main addictive substances in khat leaves are the cathinone and cathine (Schedule I and III drugs, respectively), which are prohibited by the United Nations' International Convention on Psychotropic Substances. Cathinone is the most active khat alkaloid that has many effects on the cardiovascular system such as increases blood pressure, has positive inotropic and chronotropic actions in isolated atria and elevates heart rate. Common khat usage in the long-term has been correlated with various health effects, involving oesophagitis, gastritis, duodenal ulcer, hepatic cirrhosis, autoimmune hepatitis, migraine, cerebral haemorrhage, pulmonary oedema and myocardial infarction. With respective to psychotropic effects, khat perhaps generates euphoria, elevated confidence, and enhanced alertness. In terms of adverse psycho-logical effects, khat can contribute to such conditions as depression, anxiety, mood instability, and mania. Amphetamine also shows vasoconstrictive action by stimulating the release of noradrenaline from sympathetic nerves and may participate in acute myocardial infarction. Catecholamines induce platelet aggregation and cause transient occlusion of the coronary vessels, which further becomes severe by an increase in myocardial oxygen demand induced by catecholamines. In addition to its role as a risk factor for acute myocardial infarction, amphetamine abuse may lead to chronic cardiomyopathy, pulmonary heart disease, necrotizing vasculitis, and intracranial hemorrhage. Cathinone also plays a role in the development of congenital heart disease.

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INTRODUCTION

Khat can be described as a green plant that belongs to the family of Celesterece [1]. Khat is an amphetamine-like plant which is widely chewed in East Africa, Yemen and southern Saudi Arabia. Twenty million people worldwide are believed to be using khat. Generally, the chemical composition of khat and the variety to be grown based on the geographical region, correlated climatic conditions and favorability of the environment. Khat is different in terms leaf color, size and the plant height. The main addictive substances in khat leaves are the cathinone and cathine (Schedule I and III drugs, respectively), which are prohibited by the United Nations' International Convention on Psychotropic Substances [2-5]. There are three main alkaloids present in khat leaves such as cathinone, cathine and norephedrine. Cathinone is believed to be the main active substance in khat leaves responsible for most of its physiological symptoms. Additional compounds known to impact health are attributed to number of compounds in khat ingredients including polyphenols, sterols, glycosides, amino acids, minerals and volatile oils. For simplicity, it is mainly the alkaloid constituent compounds which give khat its stimulating properties. khat is chewed for many hours in a social setting. Khat alkaloids are comprised of two groups. The first group is the cathamines, and the second is cathedulins. Cathamines are more abundant and broadly known than cathedulins because of (−) cathinone configuration. Cathine is also a potent alkaloid and is resulted in young fresh leafs; both cathinone and cathine are part of the cathamines alkaloids in the plant [6,7]. Cathinone, the most active khat alkaloid has many effects on the cardiovascular system; elevates blood pressure, has positive inotropic and chronotropic actions in isolated atria and elevates heart rate [8]. Direct vasoconstriction of isolated blood vessels does not appear to have been observed, but there is potentiation of the vasoconstriction due to electrical field stimulation; the peripheral responses are due to enhanced release of noradrenaline with an action and potency identical to those of amphetamine [9]. Cathinone and norpseudoephedrine elevate the heart rate and blood pressure with identical potency. At the peripheral norepinephrine storage site, where cathinone acts like amphetamine, the norepinephrine releasing effect of cathinone was abolished by the norepinephrine reuptake inhibitors, cocaine or desipramine. Therefore cathinone, like amphetamine, is an indirect acting sympathomimetic. The mechanism of elevated blood pressure is assumed to be vasoconstriction. Cathine also known as norpseudoephedrine elevates the heart rate and blood pressure similarly to cathinone, but to the best of our knowledge no other cardiovascular effects have been attributed to cathine [10, 11]. Khat leaves are often culturally and socially chewed

for various purposes such as accelerating social interaction, staying alert, lowering appetite, inducing euphoria, ameliorating mental performance prior to exams and elevating the self-esteem [12]. Khat is a mild psycho-stimulant that increases alert-ness, increases mood, and decreases the need to sleep [13]. Khat is chewed for its euphoric and stimulating effects, but it has multiple negative effects on different body systems [14]. Khat chewing had been correlated with gastrointestinal problems, such as mouth ulcers, inflammation of the esophagus and stomach, gum disease, jaw problems, and constipation [15]. Khat chewing is also correlated with hypertension, coronary vasoconstriction, and myocardial infarction. Moreover, khat chewing is correlated with elevated susceptibility for stroke and early death. Khat stimulates locomotor and stereotypic behavioral activity, and can in-duce seizures [16]. Khat chewing can impair driving ability, and therefore enhances road traffic accident rates. Chewing the leaves of the plant Catha edulis most frequently known as khat, likely dates to times of antiquity and may predate the use of coffee. The central stimulant effects of khat are identical to those of amphetamine. The reason is that the main active ingredient in khat is psychoactive alkaloids called cathinone, an amphetamine-like substance. Chewing of khat has been practiced in many countries for social, psychological and religious reasons. In addition, khat is broadly consumed for the purpose of elevating mood, happiness level, confidence, alertness, and thinking ability [17-19]. Frequent khat use in the long-term has been correlated with various health effects, involving oesophagitis, gastritis, duodenal ulcer, hepatic cirrhosis, autoimmune hepatitis, migraine, cerebral haemorrhage, pulmonary oedema and myocardial infarction. With respective to psychotropic effects, khat may generate euphoria, enhanced confidence, and elevated alertness. In terms of adverse psycho-logical effects, khat can contribute to such conditions as depression, anxiety, mood instability, and mania. There have also been some cases reports of drug-induced psychosis and, in individuals with established psychotic disorders, khat use may lead to an increased risk of relapse. Additionally, the use of khat by individuals with a prior history of exposure to trauma has been correlated with an increased risk of developing psychotic symptoms [20,21]. Khat chewing is known to cause serious health issues. The psychoactive compounds cathinone and cathine are phenylalkylamines present in khat, which are structurally related to amphetamine, and are responsible for most of the effects of khat. Other constituents identified involve cathidine, eduline, and ephedrine, which are less important in terms of action [22]. Cathinone causes severe coronary vasoconstriction and a severe negative inotropic effect on the cardiac muscle, proposing coronary spasm contributes to the development of acute myocardial infarction [23]. Amphetamine also reveals vasoconstrictive action by stimulating the release of noradrenaline from sympathetic nerves and may participate in acute myocardial infarction. Catecholamines induce platelet aggregation and cause transient occlusion of the coronary vessels, which further becomes severe by an increase in myocardial oxygen demand induced by catecholamines. In addition to its role as a risk factor for acute myocardial infarction, amphetamine abuse may lead to chronic cardiomyopathy, pulmonary heart disease, necrotizing vasculitis, and intracranial hemorrhage. Cathinone also plays a role in the development of congenital heart disease [24,25]. There is a positive correlation between the occurrence of anxiety and depression in Khat users. There have been sporadic reports of a possible correlation between Khat use and the occurrence of hypomania, aggressive behavior or psychoses among users. Subjective experiences of Khat use are positive when small amounts are consumed [26]. There is a feeling of well-being, a sense of euphoria, excitement, elevated energy levels, enhanced alertness, elevated ability to concentrate, ameliorated self-esteem and enhanced libido. Furthermore, there is an elevated imaginative ability and capacity to correlate as, improvement in the ability to communicate and a subjective improvement in work performance. When chewing ceases, unpleasant after-effects such as insomnia, numbness, lack of concentration and low mood tend to dominate the experience [27-29].

CONCLUSION

Khat is characterized as an amphetamine-like plant which is widely chewed in East Africa, Yemen and southern Saudi Arabia. Cathinone is believed to be the main active substance in khat leaves responsible for most of its physiological symptoms. Additional compounds known to impact health are attributed to number of compounds in khat ingredients including polyphenols, sterols, glycosides, amino acids, minerals and volatile oils. Cathinone and norpseudoephedrine elevate the heart rate and blood pressure with identical potency. At the peripheral norepinephrine storage site, where cathinone acts like amphetamine, the norepinephrine releasing effect of cathinone was abolished by the norepinephrine reuptake inhibitors, cocaine or desipramine. Therefore cathinone, like amphetamine, is an indirect acting sympathomimetic. The mechanism of increased blood pressure is assumed to be vasoconstriction. Cathinone causes severe coronary vasoconstriction and a severe negative inotropic effect on the cardiac muscle, proposing coronary spasm contributes to the development of acute myocardial infarction. Amphetamine also reveals vasoconstrictive action by stimulating the release of noradrenaline from sympathetic nerves and may participate in acute myocardial infarction. Catecholamines induce platelet aggregation and cause transient occlusion of the coronary vessels, which further becomes severe by an increase in myocardial oxygen demand induced by catecholamines.

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DATA SOURCES

Sources searched include Google Scholar, Research Gate, PubMed, NCBI, NDSS, PMID, PMCID, Scopus database, Scielo and Cochrane database. Search terms included: health problems occurred among khat consumers

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