

# From divination to madness: features of acute intoxication with *Salvia* use

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**ABSTRACT** *Salvia divinorum* is a psychoactive botanical plant that is increasingly used for the 'legal' highs that it can produce. It is readily available for purchase on the Internet, and most abusers are unaware of the toxicity and abuse potential associated with its use. As the use of novel compounds among abusers is not uncommon, physicians need to increase their awareness and recognition of these new substances. Herein, we report a case of an acute presentation of *Salvia* intoxication.

Keywords: psychiatric symptoms, *Salvia divinorum*

## INTRODUCTION

*Salvia divinorum*, also known as Diviner's Sage or Seer's Sage, is a psychoactive botanical plant used in the religious rituals of some South American countries for its dissociative, hallucinatory, and vision-producing effects. The visions produced have been reported to be mild, short-lasting and mainly religious in nature, in keeping with the situations in which they are predominantly used.<sup>(1)</sup>

Recently, however, substance abusers have been using this plant to achieve 'legal' highs, as it is readily available for purchase on the Internet and is largely unregulated. Abusers generally consider the plant as having low toxicity and a low addictive potential. The plant made its first documented appearance in Singapore in 2003, when some dried plant material analysed in the Narcotics Laboratory at the Centre for Forensic Science, Health Sciences Authority, Singapore, was found to contain the active component salvinorin A.<sup>(2)</sup> Online searches today reveal many posts about *Salvia*, including information about its use. Unfortunately, there is scarce information about its psychoactive effects in the medical literature. A PubMed literature search yielded four reports on the psychiatric sequelae of *Salvia* use, with none of the four reports describing acute phase experiences. We thus report the acute phase experiences of a patient after smoking *Salvia*. Although the patient's experiences were brief in duration, the experiences were terrifying and unusual compared to those previously reported.

## CASE REPORT

Our patient, a man in his thirties, purchased *Salvia* through a website on the Internet, where it was sold as 'plant food' and in packets labelled according to four 'strengths' – 0, 5, 10 and 20. He smoked a small amount of the '10' strength herb in a joint, and experienced vivid visual and auditory hallucinations that lasted for 12–14 mins. The hallucinations

included extracampine hallucinations of a female presence in the room, elementary- and second-person type auditory hallucinations, and pareidolic experiences, with inanimate objects such as furniture coming alive, talking to him and walking about the room. He also had visual hallucinations of ghostly figures talking to him and experienced extreme fear. His consciousness was intact throughout the experience. Despite this experience, the patient decided to try the '0' strength herb half an hour later, hoping for a 'high' without the vivid hallucinatory effects. However, he re-experienced similar symptoms that were not of lesser intensity or shorter duration. The patient discarded all the packets after both experiences. There were no reported after-effects, and in the longer term, the patient did not experience any perceptual disturbances after his exposure. Although the patient had a history of drug abuse, he had not experienced similar psychopathological symptoms with other drugs.

## DISCUSSION

To the best of our knowledge, the present report is the first report to describe the vivid hallucinatory experiences associated with the use of *Salvia*. Psychological experiences in acute intoxication with *Salvia* have not been previously reported, possibly because these experiences are brief. Furthermore, clinicians may be less familiar with the newer products that abusers are purchasing and using, such as this psychoactive plant that has hallucinogenic potential. Patients may not voluntarily mention the use of these substances, or the effects experienced, if not specifically questioned.

One report of *Salvia* use described the development of acute psychosis and paranoia that necessitated antipsychotic treatment.<sup>(3)</sup> However, the hallucinatory experiences of the patient in that case were not reported. Furthermore, the subsequent evolution of the patient's illness indicated the patient was already at risk for schizophrenia.<sup>(3)</sup> Another reported

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case involved an adolescent who had symptoms of paranoia, déjà vu experiences, and a blunted affect with thought blocking and slow speech that lasted for three days.<sup>(4)</sup> In another reported case, bizarre feelings of depersonalisation were observed in the patient.<sup>(5)</sup> Antidepressant effects have also been reported.<sup>(6)</sup> It appears that the medium-term effects of *Salvia* use are not associated with hallucinatory experiences, which are more likely a feature in acute intoxication.

The psychoactive component of *Salvia* is salvinorin A. Although salvinorin A is a potent and selective kappa-opioid and dopamine (D2) receptor agonist, its psychotomimetic effects are reported to be similar to serotonergic agonists and N-methyl-D-aspartate glutamate receptor antagonists such as mescaline and lysergic acid diethylamide.<sup>(7)</sup> Behavioural studies involving *Salvia* users have found that their experiences with *Salvia* use are similar to those with marijuana use.<sup>(8)</sup> Laboratory studies with rats have revealed depressive-like effects with salvinorin A,<sup>(9)</sup> and animal studies have shown a rapid onset of action, as well as short distribution and elimination half-lives.<sup>(10)</sup>

In the indigenous use of *Salvia*, leaf juices are extracted from the fresh leaves of the *Salvia* plant and mixed with water to create an infusion that is taken orally. The *Salvia* that was sold as 'plant food' to our patient could have been adulterated or affected by processing, contributing to the psychological effects experienced by the patient. In fact, based on our patient's experiences with the *Salvia* purchased, the *Salvia* that had differently labelled strengths could have actually been the same product labelled differently for pricing reasons. It is important to note that the actual substance smoked by the patient was not analysed in the present case. However, the acute onset and ultra-short duration of symptoms is in keeping with the pharmacokinetic profile of salvinorin A.<sup>(11)</sup> The low

costs of using a botanical plant increases the likelihood that the 'plant food' used by our patient did contain *Salvia* rather than chemically produced compounds.

This report highlights the acute phase symptoms that abusers may experience with seemingly innocuous-sounding substances such as 'plant food'. As an increasing number of abusers are turning to novel compounds to achieve highs, clinicians need to raise their level of awareness of novel drugs and have high levels of suspicion of possible drug abuse, even when blood and urine toxicology tests are negative.

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