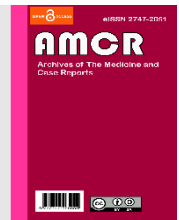




Archives of The Medicine and Case Reports

Journal Homepage: <https://jurnalke.dokteranunsri.id/index.php/AMCR>
eISSN: 2747-2051



Case Report: Magic Mushroom (*Psilocybe Cubensis*) Intoxication

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ARTICLE INFO

Keywords:

Hallucinations
Intoxication
Fungi

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All authors have reviewed and approved the final version of the manuscript.

<https://doi.org/10.37275/EHLv1i2.11>

ABSTRACT

Introduction *Psilocybe* mushroom, or widely known as the *magic mushroom* is a variety of mushroom commonly consumed because of hallucinogenic traits it causes toward its consumer. This hallucinogenic effect is caused by *Psilocybin*, a hallucinogenic substance often found within *Psilocybe* mushroom. This substance affects mental state of the consumer and has similar effect to those of LSD and *Mescaline*. Aside from its effect to cause mental disturbance, consumption of this mushroom may cause acute renal injury which leads to a fatal and life-threatening situation. **Case presentation:** A case of *Psilocybe* intoxication had been reported in a 22 years old male with a confirmed history of consuming *Psilocybe* mushroom. Patient first came with a symptom of disorientation and restlessness. Patient also often shook his head off, laughed out, screamed, and continuously making bizarre movements. Psychiatric examination confirmed a sign of auditory hallucination, unstable mood, and stereotypical behavior experienced by the patient. **Conclusion:** An approach is needed in the form of a physical examination and support that supports a prompt and precise diagnosis, as well as comprehensive management that focuses on the direct management of life-threatening symptoms and symptomatic treatment, taking into account the signs and symptoms of life-threatening nephrotoxicity

1. Introduction

Psilocybe Mushroom or commonly known as magic mushroom has been known to contain *Psilocybin*, a natural hallucinogenic substance that can affect user behavior. The resulting effect is similar to that of LSD and mescaline as other hallucinogens. Although commonly consumed because of their cheap price, magic mushroom consumption can cause acute kidney failure which can be fatal and life-threatening. There have been reported cases of magic mushroom intoxication that were found in Dr. Sardjito Yogyakarta

2. Case presentation

It has been reported that a 22 year old male patient with a history of consuming *Psilocybe cubensis* mushrooms obtained from the patient's friends. The patient was found by his family in the room behaving

strangely and difficult to communicate with. The patient also experiences disorientation, performs movements such as someone hitting a drum, raises his hand, shakes his head, and laughs at others. Sometimes the patient also screams, is agitated, shows strange expressions, and keeps making strange movements.

From anamnesis, it was found that the patient had previously undergone mental rehabilitation at the Grhasia Mental Hospital for 2 months. When reported, the patient had no symptoms of vomiting, diarrhea, or fever. The results of the examination of vital signs showed a blood pressure of 165/90 mmHg; heart rate 70x/minute; respiratory rate 20x/minute and temperature 36 degrees Celsius. There were no abnormalities on physical examination. In the mental



status examination, there was composit mental awareness, disturbed orientation, auditory hallucinations, strange and stereotypical behavior, unstable mood, irrelevant and incoherent speech patterns. Routine blood laboratory examination showed a leukocyte count of 13.08; erythrocyte 6, 11; Hb 17.9; hematocrit 50%; and platelets 366. The patient received injection of diazepam 5 mg /12 hours intra-muscularly and Clozapine 50 mg /24 hours orally. After two days, the patient's symptoms improved and the patient was discharged.

3. Discussion

Background

Magic mushroom or *Psilocybe* mushroom is a type of mushroom that is commonly consumed because it contains Psilocybin, a natural hallucinogenic substance that can cause changes in user behavior. These mushrooms can be consumed dry, namely by eating the mushrooms directly, or wet, namely as an ingredient in herbal tea concoctions or combined with other food ingredients. In rarer cases, mushroom extract is consumed by intravenous injection.

Statistically, more than 100 species of hallucinogenic fungi have been found around the world. The use of hallucinogenic fungi at 15 to 24 years ranges from 1% to 8%. In the UK, nearly 340,000 people aged 16-59 years used magic mushrooms from 2004 to 2005. Although the prevalence of mushroom use is quite common, the number of uses and cases of poisoning have not been widely studied.

Pharmacokinetics and pharmacodynamics

After consumption, these mushrooms are then digested in the stomach and intestines and undergo a metabolic process in the liver. The process of phosphorylation by the liver converts Psilocybin into an active form of this hallucinogenic substance, namely Psilocin, which will circulate through the bloodstream until it is pumped through the brain circulation.

In the brain, Psilocin has a mechanism similar to LSD in affecting the central nervous system by

increasing the function of certain serotonin (5HT-2A) which is also a controlling neuromodulator. This neuromodulator functions to control other neurotransmitters so that it can affect mental functions such as mood, perception, memory, awareness, and appetite.

Apart from being a partial agonist against the neurotransmitter serotonin, Psilocin also acts on muscarinic receptors for neurons that affect levels of the neurotransmitters acetylcholine, GABA, and glutamate. This results in involvement in body movement, memory, learning process, and emotions. This suggests that taking Psilocybin can trigger a psychotic state that mimics schizophrenia symptoms.

Effects of use

The effect that *Psilocybe* mushrooms have on the user is highly dependent on the dose consumed, individual sensitivity to these hallucinogenic substances, and the user's individual reaction to changes in neurotransmitter activity. The dosage commonly used for recreational use is reported to be between 1 and 5 grams of dried mushrooms, while fresh wet mushrooms are about 10 times as high at 10-50 grams.

The main effect of *Psilocybe* mushroom is closely related to the performance of the central nervous system, and has several sympathomimetic effects. In some cases the individual will appear very anxious, restless, confused, and experience impaired concentration and judgment. In serious cases, it can cause acute psychotic episodes in the form of visual hallucinations, severe paranoia, and complete loss of reality. This can lead to other follow-up events such as accidents, attempts to self-harm, or suicide. Although it can cause some of the sequelae above, *Psilocybe* mushroom does not cause psychological and physical dependence or withdrawal symptoms. Other physiological side effects include dizziness, nausea, weakness, muscle aches, chills, abdominal pain, and pupil dilation.

Hallucinations are a symptom most often encountered as a result of using magic mushrooms.



These main symptoms are generally neither dangerous nor outright life threatening. However, fatal consequences can occur when accompanied by involvement of kidney tissue damage as a result of other intoxication.

In some fatal cases, the consumption of magic mushrooms is thought to be closely related to the simultaneous use of other hallucinogenic substances such as alcohol use. Several other cases reported the simultaneous use of magic mushrooms with other poisonous fungi such as Cortinarius and Amanita mushrooms which have been reported to cause kidney failure. Cortinarius mushroom has orellanine toxin which inhibits DNA and RNA synthesis, causes oxidative stress, as well as direct toxicity to the renal tubular epithelium. Amanita Mushroom contains Sangatoxin toxin which is not only hepatotoxic, but also can cause gastrointestinal symptoms in the form of nausea and vomiting, and is very nephrotoxic. Kidney damage caused by these two fungi requires intensive and supportive care, and sometimes hemodialysis to maintain kidney function.

Treatment

The initial treatment of *magic mushroom* intoxication cases is carried out as in emergency care in general, namely ensuring airway patency, maintaining ventilation function and breathing processes, and maintaining blood and oxygen circulation to the tissues (Airway, Breathing, Circulation). In this primary survey, it is also necessary to assess the need for respiratory aids, maintain adequate blood pressure, and put in an infusion for fluid adequacy. If a patient has seizures, aggressive seizure management should be given. Drug administration should be carried out with extreme caution because of the possibility of unexpected drug interactions

If the primary survey has been carried out and the patient's vital signs are stable, a secondary survey is carried out in the form of a complete physical examination and an alloanamnesis to obtain a clear history of the disease and other supporting data

sources.

Until now, no specific laboratory tests have been found to detect the hallucinogenic substance Psilocybin-Psilocin in a clinical setting, so an approach is needed in the form of laboratory tests relevant to the pharmacokinetic mechanism of this substance, such as screening blood or urine for morphine, diazepam, phenobarbital, kidney function tests, liver function tests, HBsAg, chest X-rays and ECG.

Laboratory tests are also needed to confirm whether there has been damage to the kidneys. Laboratory tests in the form of measuring serum creatinine levels and creatine kinase (CK) enzymes are reported to be quite specific in assessing the impact of nephrotoxicity due to consumption of magic mushrooms. An increase in the value of the two indicators above normal levels confirms that there is damage to kidney tissue. Routine urine checks can also be done to look for signs of hematuria, proteinuria, and myoglobinuria as signs of other kidney damage.

Administration of drugs in cases of magic mushroom intoxication certainly does not only consider symptoms or symptomatic treatment, but must also pay attention to the course of the disease and other possible causes. For example, in the case of drug-related disorder, there are generally stable vital signs and no symptoms of confusion, delirium, or hallucinations; Or in psychotic disorders due to substances, hallucinations are generally found without insight. If there are indications of abnormalities in kidney function such as pain in the lower back, an increase in urea-creatinine levels, or abnormal blood pressure, it is necessary to consult with an internal medicine specialist for further management.

Regular patient monitoring is also needed to see the progress of the patient after the initial treatment. Physical examination and laboratory re-examination need to be carried out periodically to observe the progress and deterioration of the patient's condition due to intoxication, and prevent deadly complications that may arise some time after the initial intoxication. With adequate handling, it is hoped that it can speed up patient recovery and can reduce the mortality rate



due to magic mushroom intoxication.

4. Conclusion

Magic mushroom intoxication causes confusion, disorientation, hallucinations, and psychotic symptoms with rapid onset. The presence of organ involvement can lead to complications that are fatal. An approach is needed in the form of a physical examination and support that supports a prompt and precise diagnosis, as well as comprehensive management that focuses on the direct management of life-threatening symptoms and symptomatic treatment, taking into account the signs and symptoms of life-threatening nephrotoxicity. It is also necessary to periodically evaluate the patient to prevent complications that arise after the initial symptoms of intoxication. So that with adequate treatment it will be

able to speed up patient recovery, prevent fatal complications, and reduce mortality due to magic mushroom intoxication.

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