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## CASE REVIEW

# Bon appetit. Diarrhoea after eating mushrooms

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A woman in her 40s presented to her doctor with abdominal pain, nausea, vomiting, and diarrhoea. Symptoms had started within two to three hours of eating an omelette made with wild mushrooms the family had picked—what they thought were “parasols” (fig 1, top panel), but on the basis of their description by the patient were probably another mushroom species (fig 1, bottom panel). The patient did not report any confusion, excess sweating,

hallucinations, blurred vision, difficulty breathing, or discomfort. She had no history of medical conditions. On examination she showed no signs of dehydration or skin abnormalities. Heart rate and blood pressure were within normal limits. The patient’s husband and young daughter had similar gastrointestinal symptoms. The patient’s son had not eaten the omelette or any wild mushrooms and was asymptomatic.



Fig 1 | Edible mushroom species *Macrolepiota procera* (top), mycotoxin containing species *Chlorophyllum brunneum* (bottom)

### Questions

- What is the most likely diagnosis?
- What further investigations are required?
- How should this condition be managed?

## Answers

### 1. What is the most likely diagnosis?

Mushroom poisoning. It is estimated to affect 4-22 people per million population per year in the US and Europe.<sup>1-3</sup>

Mushroom poisoning can range from mild symptoms such as gastrointestinal disturbances and dermatitis to severe symptoms such as hypovolaemic shock, agitation, delirium, confusion, and seizure, and even secondary hepatorenal failure.<sup>1,4</sup> The clinical presentation depends on the species of mushroom ingested, quantity, and toxin—for example, amatoxin and muscarine.

Of 5000 known mushroom species, only 200-300 have been established as safe to eat and about 50-100 are poisonous to humans.<sup>5</sup> Identification of a mushroom relies on direct examination of the fungus or a photograph. Other factors that may help include the location where the mushroom was picked and its description.

*Chlorophyllum brunneum* (fig 1, bottom panel) and *Rubroboletus satanas* (fig 2, bottom panel) belong to a large, diverse group of mushrooms that cause gastrointestinal irritation. The mycotoxins in these mushrooms mainly cause gastrointestinal symptoms within six hours of ingestion and these usually last less than eight hours.<sup>2,3</sup>



Fig 2 | *Neoboletus erythropus* (top), an edible species of mushroom, and *Rubroboletus satanas* (bottom), a species that contains mycotoxin

Ingestion of *Amanita phalloides* (known as death cap), which contains amatoxin, typically results in persistent gastrointestinal symptoms, including abdominal cramps, vomiting, and profuse watery diarrhoea (with symptom onset more than six hours after

ingestion and lasting more than eight hours). Symptoms may progress to hepatorenal failure.<sup>256</sup>

Some other *Aminata* species, such as *A muscaria* and *A pantherina*, may lead to central nervous system effects such as delirium, agitation, and seizures.<sup>7</sup>

*Clitocybe* and *Inocybe* species contain muscarine toxin. Affected patients present with cholinergic toxicity such as miosis, diaphoresis, hypersalivation, and bradycardia.<sup>8</sup>

## 2. What further investigations are required?

Investigations depend on the onset and duration of the clinical presentation, medical history, and severity of presentation.<sup>1 4</sup>

Patients with mild gastrointestinal symptoms within six hours of ingestion and no serious medical history (eg, cardiac, renal, or pregnancy) may not require further investigations. Patients with severe gastrointestinal symptoms, however, should undergo baseline tests such as for complete blood count, renal (eg, creatinine) and liver function, and electrolytes. Patients with any other symptoms require immediate referral to hospital.

## 3. How should this condition be managed?

Consider calling the local poisons control centre for advice. Generally, treatment is primarily supportive with antiemetics and analgesics. Antidiarrhoeals are not recommended as the toxin is eliminated in faeces.<sup>1</sup> If the mushroom species is known or symptoms fit a specific toxidrome, management should be tailored to the toxin ingested. For example, if cholinergic symptoms are present, treat with atropine and if poisoning is related to amatoxin, treat with N-acetylcysteine and silibinin.<sup>6</sup>

Patients with mild gastrointestinal symptoms and an onset of symptoms less than six hours after ingestion who are able to tolerate oral intake and have no serious medical history may be managed at home. These patients should be reassessed within 24 hours.

### Learning points

- Clinical presentations for mushroom toxicity range from benign to severe depending on the species, quantity ingested, and frailty of the patient.
- Investigations may be required depending on clinical presentation (including time of symptom onset—hours after ingestion) and species ingested.
- Supportive treatment without antidiarrhoeals is the mainstay of management; toxic specific management should be instituted in some poisonings.
- Prevention and patient education remain essential.

### Patient outcome

The patient was treated with oral rehydration. Here symptoms as well as those of her husband and daughter resolved the next day. The patient was advised to avoid mushrooms if in doubt and to photograph any ingested mushrooms in the future.<sup>7 8</sup>

#### Patient involvement

One patient reminded us that it is essential to establish the link between the delay in onset of symptoms (several hours) and potential seriousness of the poisoning. She also emphasised the urgency of hospital treatment to benefit from antidote treatment, despite the presence of falsely reassuring initial test results. She highlighted that the rapid progression of the illness and the results of blood tests can be important stressors for patients.

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