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ACUTE GASTROENTERITIS: *CHLOROPHYLLUM MOLYBDITES* MUSHROOM POISONING—A DIFFERENTIAL DIAGNOSIS TO CONSIDER AND A REVIEW OF LITERATURE.

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ABSTRACT

Mushrooms are a very versatile cooking ingredient as they are loved for their delicious and meat-like texture. In the South-East Asian region, most tropical countries have a wide range of mushrooms in all shapes and sizes; they can be edible, have medicinal and industrial values, and some are even poisonous. Mushroom poisoning is regularly mistaken for common food poisoning presented with acute gastroenteritis symptoms. To date, in Malaysia, for instance, less than 100 cases of *Chlorophyllum molybdites* poisoning were reported, mostly mimicking acute gastroenteritis symptoms of diarrhoea, nausea, and abdominal pain. We report successful management of a couple who were diagnosed to have *Chlorophyllum molybdites* poisoning.

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Keywords: Acute gastroenteritis, *Chlorophyllum molybdites*, Diarrhoea, Mushroom, Food Poisoning.

INTRODUCTION

There are thousands of mushrooms species widely distributed globally; nonetheless, only about 100 species of mushrooms cause symptoms when eaten by humans.[1] It is not clear how many species that are potentially lethal when ingested.[2] The severity of mushroom poisoning will depend on where the mushroom is grown, growth conditions, the amount of toxin delivered, and its genetic characteristics.[3]

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It is reported that mushrooms can significantly reduce the risk of dementia and Alzheimer's.[4] Mushroom also considered functional foods for the mitigation of neurodegenerative diseases.[4] There is no straightforward rule in distinguishing edible from poisonous mushrooms. In more than 95% of mushroom toxicity cases, poisoning occurs due to the mushroom's misidentification by an amateur mushroom hunter.

Healthcare provider rarely encounters mushroom poisoning. Identifying the mushrooms is challenging as no compendium of poisonous mushrooms can be served as a clinician's reference during an emergency. Therefore, there are difficulties in providing

timely and proper treatment to patients suffering from mushroom poisoning. Most of the clinicians often misdiagnosed mushroom poisoning as acute infective gastroenteritis. We report successful management of a couple who were diagnosed to have *Chlorophyllum molybdites* poisoning.

CASE REPORT

We reported a case of a husband and wife who consumed a mushroom meal taken from their backyard. A 37-year-old healthy couple with no known medical illness presented with acute onset vomiting and diarrhoea more than ten episodes in a day. Both reported mild to moderate abdominal pain upon presentation. After 3-4 hours of a single ingestion of a bowl of cooked mushroom with rice, the couple experienced similar symptoms, but the husband had a worse presentation. Further enquiry revealed that she was foraging wild mushrooms (Figure 1) from the backyard and cooked them by a braised cooking method. Otherwise, both also denied history of fever to suggest infective gastroenteritis. They also did not take any other food besides that cooked by the wife.

Upon presentation, both patients were clinically dehydrated and tachycardic with heart rate of 116-122 bpm. However, both were normotensive and afebrile. Further examinations of the abdominal system and other systems examination were unremarkable for both.

Both patients received an intravenous (iv) fluid replacement of 20 mls/kg of normal saline, followed by iv maintenance fluid of 5 mls/kg/hr of normal saline until they were hemodynamically stable and admitted to the medical ward. Investigations such as full blood count, renal profile and venous blood gases were taken at initial presentation. The husband developed mild acute kidney injury

Figure 1: Chlorophyllum molybdites that was cooked and consumed by the couple. (picture taken by the patient). (Click to enlarge)

due to dehydration but his blood investigations were unremarkable. The wife's blood profile showed an acute inflammatory reaction with raised C-reactive protein (CRP) and hematocrit, leukocytosis and concurrent metabolic acidosis. Otherwise, her renal and liver function test were normal. Stool samples were sent for culture and sensitivity, and ova and cyst were negative for bacteria and parasites.

Both patients were managed conservatively with iv fluid replacement with close observations for any complications. The husband's kidney functions improved spontaneously. After several days, both husband and wife recovery sufficiently and discharged home wih follow-up at their local General Practitioner Practice.

Patient's Perspective

Both husband and wife had no prior knowledge on how to identify edible and poisonous mushrooms. They thought that the mushrooms that grew in their backyard were safe and edible. The wife regretted cooking the mushrooms for their meal, which had caused the family to be admitted with mushroom poisoning. However, as they both recovered sufficiently, she learnt not to take for granted any unidentified mushroom before cooking it.

DISCUSSION

Chlorophyllum molybdites are a highly poisonous mushroom species commonly found on lawns and open grass areas that usually spring up in Malaysia's rainy seasons.[5] *Chlorophyllum molybdites* are classified as group VII gastrointestinal irritant.[6] It is described as a mushroom with excellent flavour, and the toxin is concentrated in the partial heat-labile cap and subject to proteolytic degradation. [6]

Profuse bloody or non-bloody diarrhoea, vomiting and abdominal pain normally occurs after consuming the mushroom and are among the commonest acute gastroenteritis symptoms in the clinical presentation of *Chlorophyllum molybdites* poisoning. The symptoms typically occur after 30 minutes to 3 hours of ingestion and can be severe. [6] Nausea, thirst, mild confusion, cold sweats, and chills can persist for several hours after the consumptions. In isolated cases, autonomic symptoms such as altered perception, confusion, dizziness, dilated pupils, lacrimation, salivation, and tachycardia can be manifested.[7] Severe cases reported include complication such as hepatic failure, hemolysis, renal failure and meth-methaemoglobinaemia.[6]

Laboratories findings in *Chlorophyllum molybdites* poisoning include leukocytosis and low platelet from full blood counts and transitory abnormalities of the urine sediment. Microscopic hematuria, proteinuria and cylinduria have been reported in some cases.[8] Ingesting raw *Chlorophyllum molybdites* is also associated with mild hypofibrinogenemia and prolonged partial thromboplastin time.[9] These laboratory findings are usually nonspecific to *Chlorophyllum molybdites* and can occur to other mushroom poisonings. No reports were available to specifically relate the association of any specific mushrooms to these haematological findings.

Multiple factors influence the mushrooms' toxicity. The species, the season of the year, geographic location are among the factors determining the severity. Eating it raw, the cooking technique, co-ingestion with alcohol, and the patient's response also play a role in determining the severity of the poisoning.[6] In this case, the mushroom was cooked using a braised method and was not mixed with alcohol; hence explained a brief episode of diarrhoea and mild symptoms and faster recovery of both patients. There is a report on disseminated intravascular coagulation as part of the complication in the patient with intestinal bleeding.[9] Other than that, prolonged dehydration from gastrointestinal symptoms may lead to acute renal insufficiency and electrolyte imbalance.

Treatment options for *Chlorophyllum molybdites* poisoning are supportive care with iv fluids since there is no specific antidote for the mushrooms in this gastrointestinal irritant group. Additionally, time is taken for recovery, usually within 48 hours, with no long-term complications reported.[6] Fatalities are extremely rare with appropriate supportive care.

CONCLUSION

Mushroom poisoning can be considered as another cause of gastroenteritis. Consumption of mushroom has to be considered as part of the history-taking of gastroenteritis cases. As for *Chlorophyllum molybdites*, poisoning can come with moderate to severe symptoms, but the course is usually self-limiting. Further public education to not go foraging for wild mushrooms without prior knowledge is essential to avoid severe consequences of mushroom poisoning, particularly in tropical countries like Malaysia and other parts of South East Asia.

CONFLICTS OF INTEREST STATEMENT

The authors have no conflicts of interest to declare and consent has been obtained from patient and hospital authority to publish this article.

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