*Case Report*

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# Mad Honey Disease: A Case Report

**Rahul Kumar Chaudhary[1], Sajjad Ahmed Khan[2] and Prajwal Bista[1]**

[1]Department of Anesthesiology and Critical Care, Birat Medical College Teaching Hospital Morang, Nepal

[2]Birat Medical College Teaching Hospital, Morang, Nepal

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***Corresponding author:** Rahul Kumar Chaudhary, Department of Anesthesiology and Critical Care, Birat Medical College Teaching Hospital, Morang, Nepal, Email: rahulkr9991@gmail.com



## A B S T R A C T

The consumption of mad honey has been traditionally associated with various health benefits, including antioxidant properties and potential therapeutic effects. However, it can also pose significant health risks, particularly when contaminated with toxins or certain compounds. Wild honey can contain toxic substances such as grayanotoxanes, which are derived from the nectar of certain plants, including those in the Rhododendron family. This case emphasizes the importance of recognizing grayanotoxane toxicity from mad honey ingestion in patients with altered mental status and syncope. Early supportive care, close monitoring and a thorough differential diagnosis are critical for a favorable outcome. In conclusion, while wild honey can be a beneficial dietary component, it also presents risks that should not be overlooked. Clinicians must maintain a high index of suspicion for toxicity in patients with unexplained neurological symptoms after honey consumption. This case underscores the need for further research into the effects of wild honey and the development of guidelines for its safe consumption.

**Keywords:** Grayanotoxin, Mad honey, Syncope

## 1. Introduction

Grayanotoxins can lead to serious health complications, including gastrointestinal symptoms, cardiovascular effects and neurological disturbances, which may manifest as syncope or altered mental status[1,2]. Recent literature has documented cases of toxicity resulting from the consumption of wild honey. For instance, reports have indicated that ingestion of honey containing grayanotoxins can cause symptoms such as dizziness, hypotension and bradycardia[3]. The mechanism of action involves the binding of grayanotoxins to voltage-gated sodium channels, leading to prolonged depolarization and subsequent cardiac and neurological effects[4]. Such toxic effects can be particularly pronounced in individuals without prior exposure or underlying health conditions, highlighting the need for increased awareness among healthcare providers. In clinical practice, patients presenting with altered mental status following honey ingestion may pose diagnostic challenges. Symptoms such as confusion, dizziness and syncope can mimic other critical conditions, including cerebrovascular accidents and metabolic derangements. Thus, a systematic approach to evaluation is crucial to identify the underlying cause. Comprehensive assessments including laboratory tests, imaging studies and toxicological evaluations are often warranted[5]. The Glasgow Coma Scale (GCS) serves as a useful tool for assessing the level of consciousness and monitoring changes over time, guiding treatment decisions[6]. In recent years, there has been a growing body of literature on foodborne toxins and their impact

on public health. Understanding the clinical implications of such toxic exposures is essential for prevention and treatment. Awareness campaigns targeting both consumers and healthcare professionals are critical in educating about the risks associated with wild honey consumption, especially in regions where such products are readily available and consumed[7].

Given the potential severity of symptoms associated with toxic honey ingestion, a multidisciplinary approach to patient care is essential. This includes collaboration between emergency medicine, toxicology and critical care teams to ensure optimal outcomes. Education and training for healthcare providers in recognizing the signs and symptoms of foodborne toxin exposure can facilitate quicker diagnoses and improve management strategies.

## 2. Case Report

The patient is a 38-year-old female with no known comorbidities or significant medical history. She had no previous history of allergy or reactions to honey and this was her first time consuming mad honey. Approximately 4-5 hours after ingesting 20-30 ml of mad honey, she experienced nausea and dizziness, followed by multiple syncopal episodes and a loss of consciousness. At her initial presentation in a local hospital, she received symptomatic care, with a Glasgow Coma Scale (GCS) score of E2V2M5, indicating significant alteration in consciousness. Bilateral pupils were reactive to light, measuring 3 mm. No family members had previously consumed the same type of honey or reported any adverse reactions. Due to the deteriorating neurological status and the need for advanced care, she was transferred to a tertiary care center.

Upon admission to, her vital signs were closely monitored. Blood pressure was recorded at 150/90 mmHg, heart rate at 115 bpm, respiratory rate at 25 breaths/min and oxygen saturation ($SpO_2$) at 94% while receiving 2 L/min of oxygen via nasal prongs. Immediate interventions included supplemental oxygen through a face mask at 5 L/min and the establishment of an 18-gauge intravenous line for fluid resuscitation. A balanced crystalloid solution was administered at a rate of 100 ml/hour to maintain hydration and support blood pressure. A Foley catheter was placed to monitor urine output effectively.

A comprehensive differential diagnosis was conducted to rule out various potential causes for the patient's symptoms. The clinical team considered several conditions, including cerebrovascular events such as strokes or transient ischemic attacks, which could present with altered consciousness and syncope. Metabolic disturbances, including hypoglycemia and electrolyte imbalances, were also evaluated, as they can lead to neurological symptoms. Toxicological causes were of particular concern due to the ingestion of mad honey, raising questions about potential toxicity, including the possibility of anaphylaxis or reactions to specific compounds present in the honey, such as grayanotoxins.

To further evaluate the patient, several laboratory investigations were performed. Complete Blood Count (CBC) results showed hemoglobin at 11 g/dL, white blood cell count at 12,000/$mm^3$ and platelets at 230,000/$mm^3$. Renal Function Tests (RFT) indicated normal creatinine at 0.9 mg/dL and mildly elevated urea at 34 mg/dL, with sodium levels at 141 mmol/L and potassium at 3.5 mmol/L. Liver Function Tests (LFT) were within normal limits, while prothrombin time (PT) and International Normalized Ratio (INR) were 15 seconds and 1.1, respectively. A chest X-ray was performed and returned normal (Figure 1) and the Electrocardiogram (ECG) indicated normal sinus rhythm without any arrhythmias (Figure 2).

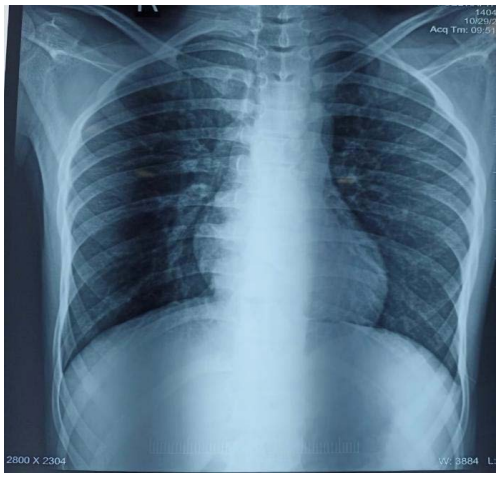

**Figure 1:** Normal Chest X-ray findings.

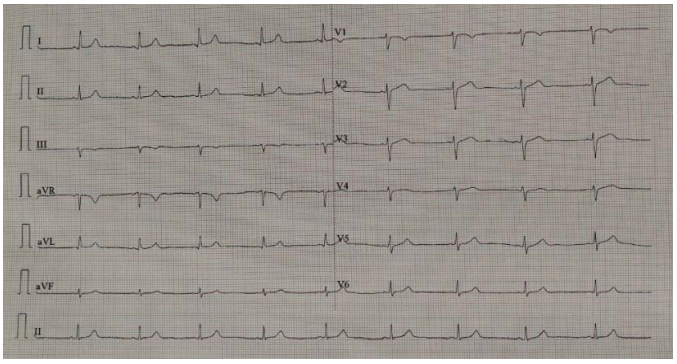


**Figure 2:** Normal Electrocardiography findings.

To confirm the toxicity of the wild honey, testing for grayanotoxins would be ideal, though no such specific testing was done at this facility. Grayanotoxin toxicity can be suspected based on clinical presentation and laboratory findings, but definitive diagnosis requires specialized assays.

Throughout her stay in the ICU, the medical team decided against intubation due to her stable hemodynamic status and adequate oxygenation. Symptomatic management was provided, which included administering paracetamol 1 g three times daily to alleviate discomfort and ondansetron 4 mg as needed for nausea.

After 48 hours of close monitoring in the ICU, the patient began to show signs of recovery, regaining consciousness and displaying an improvement in her GCS to E4V5M6. She was gradually weaned off supplemental oxygen as her oxygen saturation improved. The Foley catheter was removed and urine output remained stable throughout her ICU admission. Residual symptoms, including mild dizziness, light-headedness and nausea, were effectively managed with the previously mentioned medications. A thorough multidisciplinary evaluation was conducted to ensure that no other diagnoses were overlooked. The consensus was that her symptoms were likely related to the **mad** honey ingestion, with no significant metabolic or cerebrovascular disturbances identified.

While laboratory investigations did not show any definitive findings pointing to grayanotoxin toxicity, the patient's clinical course and the lack of other causes strongly suggested this diagnosis.

The patient made a remarkable recovery within 72 hours of her admission to the ICU. She was discharged in stable condition, ambulatory and with no further neurological deficits. During follow-up visits, the patient reported no recurrence of symptoms and successfully resumed her normal daily activities without complications. This case underscores the critical importance of thorough evaluation in patients presenting with altered mental status and syncope following potential toxic ingestions. It also highlights the need for careful monitoring and supportive care in the ICU setting, especially for patients with unexplained neurological symptoms. Future awareness regarding the potential effects of mad honey and similar substances is warranted to prevent similar occurrences.

## 3. Discussion

This case highlights the significant health risks associated with the consumption of wild honey, particularly when it contains toxic compounds such as grayanotoxins. Although wild honey is often lauded for its potential health benefits, including its antibacterial and antioxidant properties, the ingestion of contaminated honey can lead to severe and sometimes life-threatening complications. Understanding the toxicological profile of wild honey is essential for healthcare providers, especially in regions where its consumption is prevalent.

Grayanotoxins, primarily found in the nectar of plants from the Rhododendron family, are the primary concern when discussing the toxicity of wild honey. These compounds can interfere with the normal function of voltage-gated sodium channels, leading to prolonged depolarization of neuronal and cardiac cells[4]. The clinical manifestations of grayanotoxin poisoning can vary widely, ranging from gastrointestinal symptoms such as nausea and vomiting to more severe neurological and cardiovascular effects, including syncope, bradycardia and hypotension[1]. In our patient, the symptoms of nausea, dizziness and multiple syncopal episodes after ingesting wild honey are consistent with documented cases of grayanotoxin toxicity[2].

The initial management of patients presenting with altered mental status following honey ingestion necessitates a thorough evaluation to rule out other potential causes. The differential diagnosis should include cerebrovascular events, metabolic disturbances and other toxicological exposures. In this case, a comprehensive workup was performed, including laboratory tests and imaging studies, which ultimately pointed towards toxicity from the wild honey as the likely cause of the patient's symptoms. It is crucial to remember that in cases of suspected poisoning, supportive care is often the mainstay of treatment, especially when the exact toxin is unknown. Monitoring vital signs and neurological status can guide the need for more aggressive interventions such as intubation or advanced cardiac support if indicated[5].

A notable aspect of this case is the prolonged alteration in consciousness, with the patient remaining at a GCS of E2V2M5 for 24 hours before showing signs of recovery. This underscores the variability in individual responses to toxic substances and the need for close monitoring in an ICU setting. Previous studies have shown that the duration of symptoms and the severity of initial presentations can differ significantly among patients exposed to grayanotoxins, depending on factors such as the amount of toxin ingested, individual susceptibility and comorbid conditions[3].

The management of residual symptoms, such as dizziness and nausea, further illustrates the complexity of care for these patients. In this case, the use of paracetamol for discomfort and ondansetron for nausea proved effective, highlighting the importance of symptomatic treatment in supportive care protocols. The successful weaning off supplemental oxygen and the stable urine output observed during the ICU stay also indicate an overall positive trajectory in the patient's recovery.

The multidisciplinary approach to care, involving emergency medicine, toxicology and critical care specialists, is essential in managing cases of suspected toxin exposure. Collaboration among various medical disciplines allows for a more comprehensive understanding of the patient's condition and ensures that all potential complications are addressed. Furthermore, education for healthcare providers regarding the risks associated with wild honey consumption is vital for improving clinical outcomes. Increased awareness can lead to quicker recognition and management of similar cases, ultimately reducing morbidity associated with toxin exposure[7].

Given the growing popularity of natural and alternative remedies, including honey, it is imperative to raise public awareness about the potential dangers of wild honey consumption. Campaigns aimed at educating consumers about the risks associated with unprocessed honey, especially in areas where toxic varieties may be present, can help mitigate health risks. This is particularly relevant in regions where local flora includes species that produce harmful compounds, emphasizing the need for caution when consuming wild honey[8,9].

## 4. Conclusion

In conclusion, while wild honey can offer various health benefits, it is crucial to recognize and communicate the potential risks associated with its consumption. The clinical implications of this case serve as a reminder for healthcare professionals to maintain a high index of suspicion for toxin exposure in patients presenting with unexplained neurological symptoms after honey ingestion. As our understanding of foodborne toxins continues to evolve, ongoing research is essential to establish clear guidelines for the safe consumption of honey and to improve the management of toxicity cases. Future studies should focus on the prevalence of toxic compounds in wild honey, the effects of varying doses on health outcomes and the development of effective treatment protocols for affected patients. This case underscores the need for clinicians to consider mad honey toxicity in patients presenting with unexplained syncopal episodes and altered consciousness following honey consumption. While rare, mad honey poisoning can lead to significant morbidity if not recognized and treated promptly. Public health efforts should focus on educating consumers about the potential dangers of consuming wild honey in regions where grayanotoxin-containing plants are common.

## 5. Acknowledgement

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