Case Report

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Anaphylactic shock following the mad honey consumption: a case report

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Introduction: Mad honey consumption is a common practice in Nepal for medicinal and consumption purposes, but it can lead to severe adverse effects. Grayanotoxin I and Grayanotoxin III isoforms found in rhododendron interfere with voltage-gated sodium channels resulting in gastrointestinal symptoms, and cardiovascular effects such as low blood pressure, abnormal heart rhythms, cardiac arrest, and abnormal electrical conduction in the heart, as well as rare central nervous system disorders. Here the authors report a case of Mad honey consumption leading to anaphylactic shock along with its investigations and management.

Case presentation: The authors present a case of a 51-year-old female who developed anaphylactic shock after consuming mad honey. The patient experienced symptoms including nausea, vomiting, abdominal pain, sweating, dizziness, facial and lip swelling, but no chest pain, loss of consciousness, abnormal body movement, or dyspnoea. The patient had no prior medical conditions, regular medications, or history of allergic reactions to honey or pollen.

Discussion: Mad honey intoxication is caused by grayanotoxins, with distinct cardiac effects for different types of grayanotoxins. Symptoms include bradycardia, hypotension, abdominal pain, dizziness, and nausea, which subsided within 24 h following the initial management. The presence of grayanotoxin can be detected using specialized instrumentation, but it may not be available in all medical facilities. Co-intoxication with alcohol or propolis may also occur.

Conclusion: This case highlights the importance of recognizing and managing complications associated with mad honey consumption, particularly in regions where it is prevalent. Prompt medical attention is advised if unusual symptoms occur after honey consumption.

Keywords: anaphylactic shock, case report, mad honey

Introduction

Honey is widely used in Nepal for medicinal and consumption purposes. But there are very rare cases of mad honey consumption leading to Anaphylactic shock reported so far. The side effects of mad honey consumption include cardiac disorders such as hypotension, Atrioventricular block, atrial fibrillation, asystole, and rarely the central nervous sytem (CNS) disorders like convulsions and syncope[1]. The Grayanotoxin I and III isoforms found in rhododendrons are found to be responsible for such events. These toxins interfere with the voltage-gated sodium channels by binding the channels in the activated state, leading to hyperpolarization effects[1]. Here we present a case of 51 years old female who had consumed famously mad honey presenting as a case of anaphylactic shock to emergency department . This case has been reported in line with SCARE criteria[2].

HIGHLIGHTS

- Mad honey from Nepal consists of Grayanotoxin 1 and Grayanotoxin 3 which affect sodium channels, leading to prolonged depolarization and hyperpolarization effects.
- Mad honey consumption can lead to anaphylaxis and needs immediate management.
- Diagnosis and management can be challenging in low resources.

Case presentation

A 51-year-old Nepali female presented to the emergency department (ED) of a tertiary care hospital with complaints of acute onset of nausea, vomiting, abdominal pain profuse sweating, and dizziness for 2 h. The patient experienced symptoms after she consumed four tablespoons of mad honey from the Lamjung district of Nepal. She also complained of mild facial and lip swelling following the consumption of honey. There was no mention of chest pain, loss of consciousness, abnormal body movement, or dyspnoea. The patient had no history of any serious medical conditions and she was not under any regular medications. There was no previous history of any anaphylactic reaction to honey or pollens and had no known allergic history to her or their family member.

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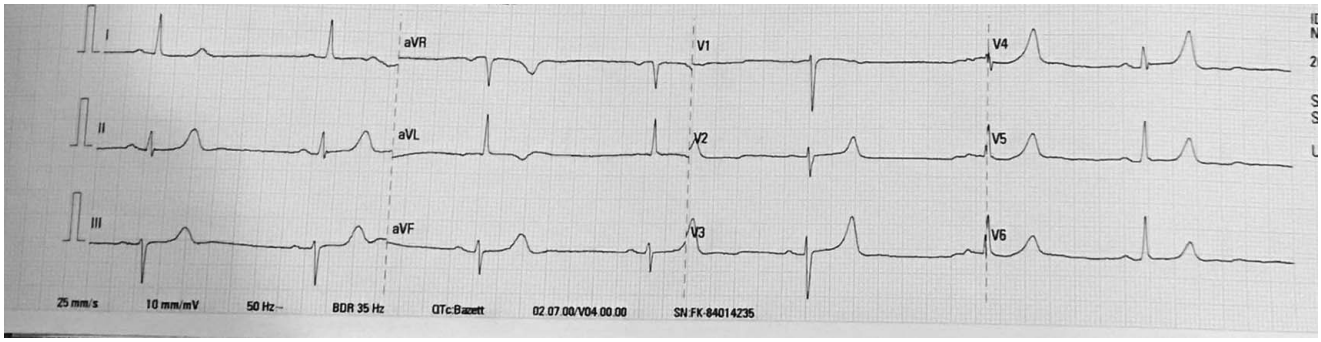

Figure 1. Electrocardiogram at time of presentation in emergency department.

Physical examination

On physical examination, the patient was well-oriented to time, place, and person. Physical examination showed a moderately built female sweating profusely. On vital examination, an abnormal blood pressure of 70/50 mmHg, and a pulse rate of 47 beats per min (bpm) were recorded. Temperature (98.F) and respiratory rate (15 breaths per min) were normal. Breath sounds were normal and no cardiac murmur or pathological heart sounds on auscultation. Neurological examination revealed the patient had mild confusion (14/15 on the Glasgow coma scale).

Investigations

An electrocardiogram (ECG) done in the ED showed sinus bradycardia with a heart rate of 47 bpm without any conduction delays (Fig. 1).

Laboratory investigations were normal only MCH (35 pg) was found to raise as per the reference values (Table 1).

Based on clinical presentation, a team of emergency medicine physicians and internists diagnosed this as a case of mad honey intoxication with suspected anaphylaxis. The patient was initially stabilized in the ED with intravenous normal saline (0.9%) along with intramuscular epinephrine 0.5 mg stat to manage anaphylaxis. The patient was also started on atropine 1 mg for sinus bradycardia following which the patient's blood pressure improved to 120/70 mmHg and pulse rate was 105 bpm. The patient was then shifted to ICU where she was managed conservatively. However, during the first 4 hours, her blood pressure decreased to 90/60 mmHg and her pulse rate fell to 50 bpm following which injectable hydrocortisone 100 mg was administered which improved the blood pressure to 110/70 mmHg over the next 20 min and the pulse rate gradually improved to 70 bpm over the next 1 h. The ECG taken after treatment was normal as seen in Figure 2.

The patient was kept NPO for the first 24 h following which she was started on sips then a soft diet was started. The patient was kept in ICU for 2 days following which she was transferred to the medicine ward where her course was uneventful. She was discharged the following day and was advised not to consume mad honey in the future and all signs of anaphylaxis were explained to her and family members. The patient was satisfied with the treatment. On follow-up after 2 weeks the patient is doing well.

Discussion

Most cases of mad honey intoxication and anaphylaxis are due to its contamination by grayanotoxins. Grayanotoxins are diterpenes, polyhydroxylated cyclic hydrocarbons, containing no nitrogen group. Till now over 18 types of grayanotoxins have been found, each with effects of its own. Grayanotoxin I and III are generally associated with cardiac manifestation while Grayanotoxin II is usually less toxic[3].

A systematic review on Mad honey intoxication revealed that the majority of cases (75.17%) were observed in males, with bradycardia (79.58%) being the most frequently reported clinical symptom. The review also indicates that Mad honey intoxication typically results from the consumption of 1–5 tablespoons, which aligns with our specific case where patients ingested four

Table 1

Laboratory investigations of the patient

Test	Result	References
Haemoglobin (mg/dl)	13.5	11–16
TLC (cells/mm^3)	8300	4000–11 000
DLC (%)	N-64	N-40–75
	L-25	L-20–45
Platelets (cells/mm^3)	202 000	150 000–400 000
MCH (pg)	35	27–34
MCHC (g/dl)	36	32–36
MCV (fl)	96	80–96
PT (sec)	16	12–16
INR	1.0	
RBS (mg/dl)	119	80–140
Serum urea (mg/dl)	35	10–50
Serum creatinine (mg/dl)	0.8	0.6–1.3
Serum sodium (meq/l)	144	135–150
Serum potassium (meq/l)	3.7	3.5–5.1
Liver function test		
Total protein (g/dl)	6.9	6.0–8.3
Albumin (g/dl)	4.2	3.5–5.0
Total bilirubin (mg/dl)	0.9	0.2–1.2
Conjugated bilirubin (mg/dl)	0.3	< 0.3
ALT (U/l)	30	09–43
AST (U/l)	21	10–35
ALP (U/l)	60	35–130

ALP, alkaline phosphatase; ALT, alanine transaminase; AST, aspartate transaminase; DLC, differential leucocyte count; INR, international normalized ratio; MCH, mean corpuscular haemoglobin; MCHC, mean corpuscular haemoglobin concentration; MCV, mean corpuscular volume; PT, prothrombin time; RBS, Random Blood Sugar, TLC, total leucocyte count.

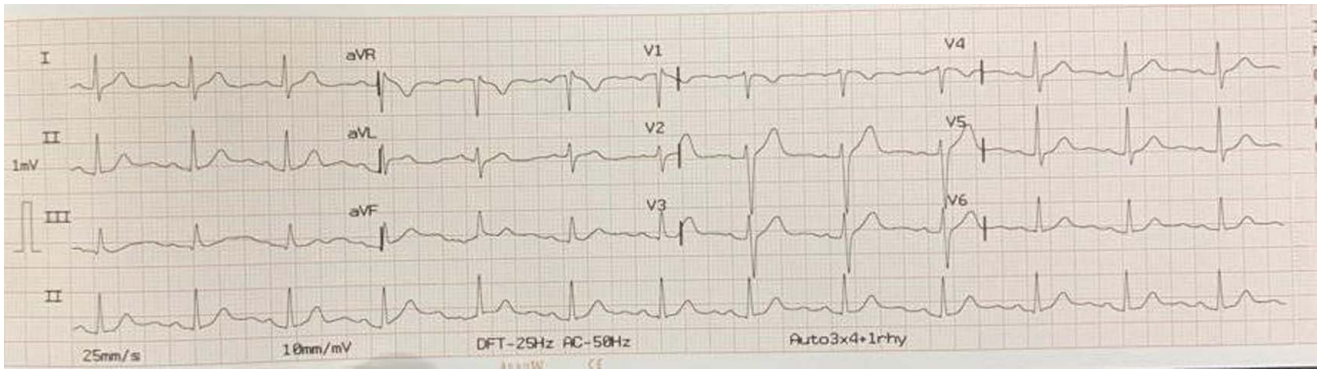

Figure 2. Electrocardiogram after initial management in emergency department.

tablespoons of Mad honey[4]. Anaphylaxis is a serious allergic response that often involves swelling, and lowered blood pressure and results in shock. In our case patient presented with decreased blood pressure and was managed in lines of shock[5].

Most case reports from Nepal on Mad honey anaphylaxis report hypotension, and bradycardia as a predominant feature as was seen in this case. Along with this patient also experienced abdominal pain, dizziness, and nausea which were similar to the presentation in this case[6–8]. Our patient had symptoms for more than 2 days while in most of the cases, it is being reported that symptoms related to mad honey subsides within 24 h[9].

In an experiment done on squid, it was found that there is tonic inhibition of central vasomotor centres and decreased sympathetic output causing various cardiac symptoms. When grayanotoxin binds to the group II receptor site in voltage-gated sodium channels ($Na_v1{\cdot}x$), it is maintained in the state of depolarization which results in increasing inward current and decreasing outward current of sodium on the cell membrane at the sinus node. Such a condition will eventually lead to sinus dysfunction. Also, it affects the CNS more than the peripheral systems[1,10].

Grayanotoxin I and III present in the blood, and urine can be detected by using liquid chromatography with mass spectrometry or time-of-flight mass spectrometry instrumentation[11]. Such a type of investigation is not available in our hospital so we could not quantify the levels of grayanotoxin levels in this patient. Our patients also consumed alcohol on the same day. We could not find cases of co-intoxication that have been recorded to date. There are also rare reports of propolis, a component of wax used by bees for making hives causing allergy to patients when it is mixed in bees honey[12].

Conclusion

Our case highlights the presentation and management of anaphylaxis results due to mad honey consumption. The honey was from the Lamjung district of Nepal popularly known for its rhododendron forest and there are geographical variations in presentation with honey intoxication all over the world. A detailed history plays a significant role in diagnosis in low-resource countries like Nepal. Management can be done for anaphylaxis as per the American Academy of Allergy, Asthma, and Immunology 2020 guidelines. Patients should be educated about all the signs of anaphylaxis and restrict the consumption of mad honey in huge amounts. There is no mortality reported so far in Nepal due to mad honey intoxication; however, we cannot neglect the cardiac and neurological effects of mad honey and anaphylaxis that can cause severe harm to public health and even death.

Ethical approval

This is a case report therefore, it did not require ethical approval from the ethics committee.

Consent

Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author contribution

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We confirm that this manuscript is original, has not been published before, and is not currently being considered for publication elsewhere. Furthermore, we confirm that all the authors have approved the manuscript and that there are no other persons who satisfied the criteria for authorship and are not listed above. The orders of authors listed in the manuscript have been approved by all of us.

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