

Mad honey poisoning: a rare case report of seven cases

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ABSTRACT

The cause of mad honey poisoning is the toxin grayanotoxin, found in honey obtained from the nectar of *Rhododendron* species on the higher altitudes. This case report is about seven cases of grayanotoxin poisoning that occurred after consumption of wild honey that was brought from the Himalayan belt of Nepal. Most of them presented with symptoms of blurring of vision, diplopia, nausea and vomiting and two of them presented with symptoms of cardiac depression. All of the cases responded well to intravenous fluid and/or pressor agents while none proved to be fatal

Keywords: Mad honey, Grayanotoxin, Nepal (Himalayan belt).

Mad honey poisoning is a well known condition in the Black Sea of Turkey. The cause of poisoning is the toxin known as grayanotoxin found in honey obtained from the nectar of *Rhododendron* species growing naturally in the mountains of the region. The toxin is polyhydroxylated cyclic hydrocarbon that does not contain Nitrogen.^{1,2} Cases of grayanotoxin poisoning have been reported from Turkey, Austria, Korea and a few other countries. To our knowledge, till date there is no reported cases from Nepal.

CASE REPORT

Seven individuals started developing various symptoms after consuming varying amounts of wild honey. They developed various symptoms and all of them were taken to the hospital without delay. Following is the brief summary of all the seven cases:

CASE 1

Twenty five years old male presented to the Emergency department with complaints of nausea, burning sensation in the throat, 4 episodes of vomiting, weakness, diplopia and shortness of breath and intermittent blackouts after consuming 10 tea spoon full (150ml) of wild honey. The symptoms started after 5 minutes of consumption and the patient reached the hospital with 20 minutes of initial symptoms. In ER he was unconscious, pupils were bilaterally dilated and not reacting to light. Systolic blood pressure was 60 mm of Hg, while diastolic blood pressure could not be recorded. Radial pulse was not palpable, carotid pulse was feeble, saturation without oxygen was 64%. No abnormalities were detected on examination of chest, abdomen and CNS. All other investigation were found to be within normal limits. The patient was shifted to the intensive care unit and was administered intravenous fluids (2 liters), atropine, adrenaline and continuous dopamine infusion after which patient showed marked symptomatic improvement and regained consciousness. The patient also received metoclopramide,

ranitidine, diphenhydramine and hydrocortisone for symptomatic management. The medications were stopped after 24 hours and the patient was discharged after observation for one day.

CASE 2

Twenty four year old male presented with complaints of burning sensation in the throat, flushing of face, mild dizziness, headache, nausea and intermittent blackouts after consuming 8 tea spoon full (120 ml) of wild honey. The symptoms started within 5 minutes of consumption and the patient was immediately brought to the emergency where he vomited 3 times and lost consciousness. On examination, pupils were bilaterally dilated and reacting sluggishly to light, radial pulse was not palpable, carotid pulse was feeble, and the rate was 35 per min, both systolic and diastolic blood pressures were not recordable. The patient was immediately transferred to the intensive care unit and was administered intravenous fluids, adrenaline and continuous dopamine infusion. Symptomatic treatment was given with diphenhydramine, metoclopramide, and hydrocortisone. The patient showed rapid improvement after the medications which were continued for 24 hours and he was discharged a day later.

CASE 3

Twenty four year old male presented with complaints of diplopia, and blurring of vision, blackouts and loss of consciousness after consuming 5 tea spoon full (75 ml) of wild honey. In the hospital, his blood pressure was 100/70 mm of Hg, pulse was 70 per min. The patient was given intravenous fluids and the patient showed gradual improvement without any pressor agents. Symptomatic treatment was given as above and he was discharged a day later.

CASE 4

Twenty two year old male presented with complaints of

dizziness and blurring of vision after consuming 3 tea spoon full (45 ml) of wild honey. On examination his vitals were within normal limits. He was given intravenous fluids and kept under close observation. His symptoms gradually resolved and he was discharged a day later.

CASE 5

Twenty two year old male presented with complaints of dizziness, blurring of vision and nausea after consuming 3 tea spoon full (45 ml) of wild honey. His vitals were stable, and he was also given intravenous fluids and symptomatic treatment. His symptoms gradually resolved and he was discharged a day later.

CASE 6

Twenty three year old male presented with complaints of diplopia, blurring of vision, dizziness and two episodes of vomiting after consuming 2 tea spoon full (30 ml) of wild honey. His general condition was fair, blood pressure was 80/40 mm of Hg, pulse was 48/min, pupils were bilaterally dilated and sluggishly reacting to light. He was given intravenous fluid and symptomatic medications to which he showed gradual improvement and was discharged a day later.

CASE 7

Twenty four year old male presented with complaints of diplopia, blurring of vision, dizziness and two episodes of vomiting after consuming 2 tea spoon full (30ml) of wild honey. His vitals were stable. He recovered fully after receiving intravenous fluids and symptomatic treatment. He was admitted for observation and was discharged a day later.

DISCUSSION

Grayanotoxin is a toxin found in rhododendrons growing in higher altitudes. There are some 700 different rhododendron species in the area comprising China, Tibet, Myanmar, Assam and Nepal, nearly 300 species in New Guinea, many in Japan, and others in tropical Asia from Indochina to Indonesia and the Philippines, while a small number occur in Europe and North America. Purple Flowered (*R. ponticum*) and yellow flowered (*R. luteum*) rhododendrons are widespread along the Black Sea coast in northern Turkey.^{3,4} It is thought that of the various rhododendrons species widespread along the Black Sea region flora, *Rhododendron luteum* and *Rhododendron ponticum* are the main sources of grayanotoxin.³ The specific species of rhododendron found in Nepal which contains the toxin is not known.

Bees feeding on these rhododendrons are known to transfer the grayanotoxin to the honey they produce. Hence, honey is the main source of grayanotoxin poisoning which is also called "mad honey". In Nepal there is also a taboo of eating small amount raw rhododendron petals for various ailments but it has not been known whether they are associated with any

poisoning. The honey is also popular among the indigenous people as an aphrodisiac.

Grayanotoxin attach to sodium channels on the cell membrane, increases sodium channel permeability and inhibits repolarization. Therefore, grayanotoxin maintains cell membrane depolarization leading to weakened action potential. Ultimately the decreased action potential in the sinoatrial node brings about the sinoatrial dysfunction.⁵ Atropine sulfate improves both bradycardia and respiratory rates but selective M2 muscarinic receptor antagonist only restore heart rates. This means M2 muscarinic receptors may be involved in cardiotoxicity.^{6,7}

Grayanotoxin has been known to cause bradycardia, cardiac arrhythmia, hypotension, nausea, vomiting, sweating, salivation, dizziness, weakness, loss of consciousness, fainting, blurred vision, chills, cyanosis and convulsions. Most of the cases tend to be mild and are self limiting within 24 hours. The majority of those who do seek medical care recover with administration of 0.5 -1.0 mg atropine and controlled fluid replacement. In rare, life threatening cases, cardiac arrhythmias requiring cardiac pacing may occur.⁸

Mild poisoning is well-known to the local inhabitants of Black Sea and they do not generally visit institutions when affected. However, patients with severe symptoms do go to hospital, and patients whose heartbeat and vital signs improve are discharged after 3 to 6 hours.¹ Cases of grayanotoxin poisoning have been reported from Turkey, Austria, Korea and some other countries but no documented case of Grayanotoxin have been published or reported from Nepal to the author's information.

Although honey is a widely used food product and is claimed to have various therapeutic benefits, the actual beneficial effect of honey is not well documented. Honey, being a commonly used food commodity, more studies is required for its potential life threatening effects, their prevention and treatment.

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