Cardiac Problems in Mad-Honey Intoxication

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Mad-honey disease or honey intoxication is caused by consuming honey produced from leaves and flowers of the Rhododendron family. Here a case of honey intoxication with cardiac involvement is reported. (Circ J 2008; 72: 1210–1211)

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Honey intoxication is caused by the consumption of honey from the nectar of rhododendrons! Grayanotoxins cause the intoxication. Other names associated with this intoxication are rhododendron poisoning, mad honey intoxication or grayanotoxin poisoning.

Case Report

A 67-year-old man was admitted to our hospital with sudden development of general weakness and dizziness. The symptoms began within 2 h of drinking 20 ml of honey, which was known to be mad-honey. He had previous history of hypertension, CVA and angina. At presentation, he was in cardiogenic shock. His body temperature was 35.5°C, blood pressure 70/50 mmHg and heart rate was 45 beats/min (Fig 1). His consciousness was clear, but he complained of chest discomfort and dizziness. The electrocardiogram showed a junctional rhythm, and blood examination showed normal cardiac enzymes. A chest radiograph showed no active lung lesions except for mild cardiomegaly. Echocardiography revealed normal left ventricular systolic function without any regional wall motion abnormality. Parenteral fluid was administered, and atropine was given for symptomatic treatment of bradycardia. Fifteen minutes after atropine injection, his heart rate was 71 beats/min with a normal sinus rhythm (Fig 2), and his blood pressure was 90/55 mmHg. Seven hours after admission, his vital signs were fully recovered, especially blood pressure and heart rate.

Discussion

Generally, toxic honey disease induces dizziness, weakness, excessive perspiration, nausea and vomiting shortly after the toxic honey is ingested. Other symptoms that can occur are low blood pressure or shock, bradycardia, sinus bradycardia, nodal rhythm, Wolff-Parkinson-White syndrome and complete AV block.2

Mad-honey intoxication is caused by grayanotoxins. Grayanotoxins lead to cardiac toxicity because they increase sodium channel permeability and activate the vagus nerve.

Grayanotoxins attach to sodium channels on the cell membrane. This combination increases sodium channel permeability and inhibits repolarization. Therefore, grayanotoxins maintain cell membrane depolarization. In particular, the increasing inward current of sodium on the cell membrane and decreasing outward current of sodium on the cell membrane at the sinoatrial node causes weakened action potential. Ultimately, decreased action potential brings about sinus node dysfunction.3 Atropine sulfate improves both bradycardia and respiratory rates but selective M2-muscarinic receptor antagonists only restore heart rates. This means the M2-muscarinic receptor may be involved in cardio toxicity.4

Onat et al suggested that the sites of cardiac and respiratory actions are within the central nervous system, and the bradycardia is mediated by vagal stimulation at the periphery.4 Also non-selective muscarine antagonists (especially atropine) and selective muscarine antagonists (especially AF-DX 116) could act as antidotes.

Mad-honey intoxication is rarely fatal and generally lasts for no more than 24 h. Therefore, supportive care is sufficient as a treatment for mad-honey intoxication. Severely lowered blood pressure usually responds to the administration of fluids and correction of bradycardia; therapy with vasopressors is only rarely required. Sinus bradycardia and conduction defects usually respond to atropine therapy. We also treated this patient using atropine, along with the administration of normal saline, and the patient fully recovered.

Mad-honey intoxication was commonly seen in the eastern Black Sea region.5 People who live in the eastern Black Sea region used this honey for alternative therapies, especially for the treatment of gastrointestinal diseases such as gastritis and peptic ulcer. Additionally, it is believed that mad-honey reduces the risk of coronary heart disease and increases life expectancy when used continuously.6

In the Republic of Korea, mad-honey consumption is increasing. According to the Korea Food and Drug Administration (KFDA), 8,048 kg (806 kg in 2003, 7,242 kg in 2004) with a value of US $37,498 (US $5,928 in 2003, US $31,570 in 2004) of mad-honey were imported in recent years.7 Importation of mad-honey was prohibited in 2005. However, increased travel and developing transport systems allow for covert distribution.

Mad-honey intoxication is a form of mild poisoning. However, some situations, such as high dosage, old age and taking it mixed with other drugs that act on the sodium channel, are fatal to health. Honey has been used in alternative therapies using bee's saliva, most commonly for the treatment of respiratory diseases as well as for its anti-inflammatory action.
therapies across the world. However, the therapeutic effects of honey are not fully understood. Despite its dangerous potential for the health of the public, there is no detailed information available on the chemical properties and detection of mad-honey, prevention of mad-honey toxicity or methods for reducing grayanotoxins in honey. Therefore, we wanted to share our experience and call more attention to the wide use of honey in alternative therapy.

References