

Watershed infarction after honey intoxication

Murat Mümin Yazıcı¹, Esra Yenikurtuluş¹, Gökçen Akça², İsmail Barkın Işık²

¹ Department of Emergency Medicine, Rize State Hospital, Rize, Turkey

² Department of Neurology, Rize State Hospital, Rize, Turkey

³ Department of Cardiology, Rize State Hospital, Rize, Turkey

ORCID ID of the author(s)

MMY: 0000-0003-1957-7283
EY: 0000-0001-6516-5058
GA: 0000-0002-5350-7257
IBI: 0000-0002-7193-827X

Abstract

Watershed infarction indicates ischemic lesions at the junction of two central artery regions. These lesions are the cause of 10% of all brain infarctions. In watershed infarctions, disrupted hemodynamics constitute the pathophysiology. A specific type of honey in the Black Sea region of Turkey, "mad honey," contains grayanotoxin and may cause intoxication. We herein report a case with watershed infarction after honey intoxication. The patient presented with dizziness and paresthesia in the left arm after eating "mad honey." Imaging revealed carotid stenosis and watershed infarction.

Keywords: Watershed infarct, Mad honey, Stroke

Introduction

Watershed infarction indicates ischemic lesions at the junction of two central artery regions [1]. These lesions are the cause of 10% of all brain infarctions [2] and are divided into subcortical and cortical infarctions [3]. Subcortical watershed infarctions are usually small lesions in the centrum semiovale or corona radiata parallel to the lateral ventricle. In contrast, cortical watershed infarctions are cortical lesions between the anterior, middle, and posterior brain arteries [4]. The general principle in the pathophysiology of Watershed infarctions is a hemodynamic disruption [5].

A specific type of honey in the Black Sea region of Turkey, also called "mad honey," contains grayanotoxin and sometimes causes intoxication [6]. "Mad honey" poisoning is potentially fatal if left untreated, but fatal cases have not been reported in the literature [7]. Symptoms of grayanotoxin intoxication are dose-related. In mild cases, dizziness, weakness, excessive sweating, hypersalivation, nausea, vomiting, hypotension, bradycardia, and paresthesia are observed. Severe cases may present with life-threatening cardiac complications such as an atrioventricular block [8].

In our case report, we aimed to draw attention to the watershed infarction in a patient who presented to the emergency department with honey intoxication.

Corresponding Author

Murat Mümin Yazıcı
Department of Emergency Medicine, Rize State Hospital, Rize, Turkey, 53020
E-mail: mmuratyazici53@gmail.com

Informed Consent

The authors stated that the written consent was obtained from the patient presented with images in the study.

Conflict of Interest

No conflict of interest was declared by the authors.

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Case presentation

An 88-year-old female patient was admitted to the emergency room with dizziness and paresthesia in the left arm. She was well-oriented and cooperative. Her Glasgow Coma Score (GCS) was 15, blood pressure was 70/30 mmHg, heart rate was 45/minute, and respiratory rate was 14 /minute. Her complaints had begun after eating honey and were present for 5 hours. She had a history of hypertension and chronic kidney disease. There was no right-left motor impairment; however, she had hypoesthesia in the left upper extremity and sinus bradycardia in the ECG. Blood hemogram and biochemical values were normal. While no acute pathology was observed in the brain computerized tomography (CT) images, watershed infarction was seen in diffusion MRI (Figures 1 and 2). Echocardiography revealed no cardiac pathologies. In the carotid Doppler ultrasound, 50% and 70% stenoses were detected in the right and left internal carotid arteries (ICA), respectively. The patient was admitted to the neurology service for follow-up and treatment. Approval was obtained from the patient for the publication of this case report.

Figure 1: Diffusion-Weighted Imaging (DWI) - MRI

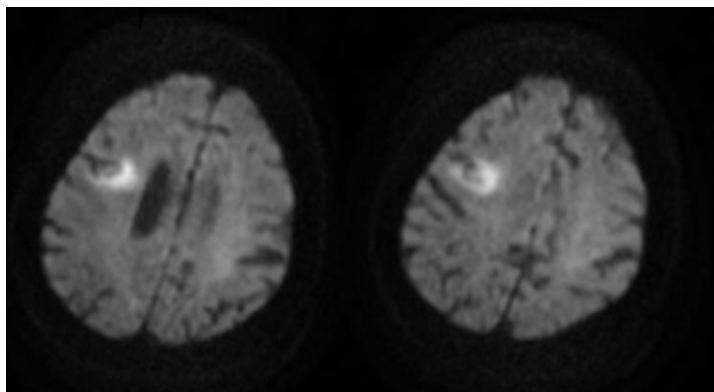
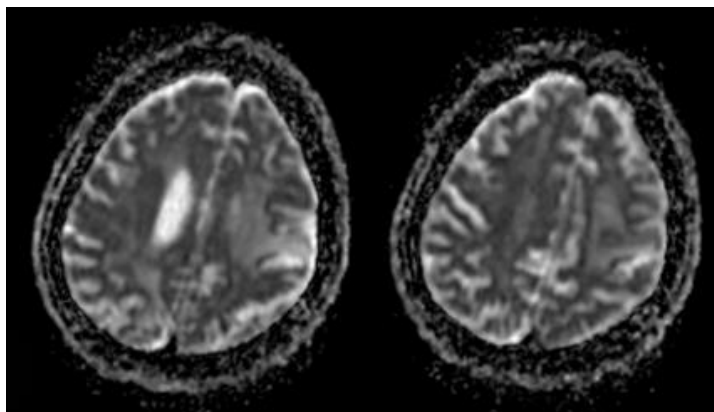


Figure 2: (A) – Apparent Diffusion Coefficient (ADC) - MRI



Discussion

Watershed infarctions occur because of severe stenosis of the craniocervical arteries due to impaired hypoperfusion in case of cardiac arrest or severe hypotension [9]. Studies showed the relationship between carotid stenosis and watershed infarction [10]. Caplan and Hennerici reported the coexistence of severe carotid stenosis and watershed infarction in a patient with a transient neurological disorder [11].

Beekeeping is an everyday activity among the local people in the Eastern Black Sea region. The honey sometimes

contains grayanotoxin and causes poisoning [12]. The toxic effects are rarely fatal and usually last no more than 24 hours. After eating toxic honey, dizziness, weakness, sweating, nausea and vomiting, salivation, blurred vision, fainting, tremors, numbness in the extremities, and loss of consciousness may be observed. Other probable complaints include low blood pressure, bradycardia, complete atrioventricular block, and shock [13].

Conclusions

As in our case, watershed infarction can be observed in patients admitted to the emergency department after consuming honey. Physicians should keep in mind a possible infarction in patients with neurological complaints after consuming honey, and the necessary tests should be performed for etiological research and diagnosis.

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References

- Schneider M. Durchblutung und sauerstoffversorgung des gehirns. *Verh Dtsch Ges Kreislaufforsch.* 1953;19:3-12.
- Torvik A. The pathogenesis of watershed infarcts in the brain. *Stroke.* 1984; 15(2):221-3.
- Derdeyn CP, Khosla A, Videen TO, Fritsch SM, Carpenter DL, Grubb RL Jr, et al. Severe hemodynamic impairment and border zone--region infarction. *Radiology.* 2001;220(1):195-201.
- Moriwaki H, Matsumoto M, Hashikawa K, Oku N, Ishida M, Seike Y, et al. Hemodynamic aspect of cerebral watershed infarction: assessment of perfusion reserve using iodine-123-iodoamphetamine SPECT. *J Nucl Med.* 1997;38(10):1556-62.
- Yong SW, Bang OY, Lee PH, Li WY. Internal and cortical border-zone infarction: clinical and diffusion-weighted imaging features. *Stroke.* 2006;37(3):841-6.
- Gunduz A, Turedi S, Uzun H, Topbas M. Mad honey poisoning. *Am J Emerg Med.* 2006;24(5):595-8.
- Von Malottki K, Wiechmann HW. Acute life-threatening bradycardia: food poisoning by Turkish wild honey. *Dtsch Med Wochenschr.* 1996;121(30):936-8.
- Ergun K, Tufekcioglu O, Aras D. A rare cause of atrioventricular block: mad honey intoxication. *Int. J. Cardiol.* 2005;99:347-348.
- Moustafa RR, Izquierdo-Garcia D, Jones PS, Graves MJ, Fryer TD, Gillard JH, et al. Watershed infarcts in transient ischemic attack/minor stroke with 50% carotid stenosis: hemodynamic or embolic? *Stroke.* 2010;41(7):1410-6.
- Del Sette M, Eliasziw M, Streifler JY, Hachinski VC, Fox AJ, Barnett HJ. Internal borderzone infarction: a marker for severe stenosis in patients with symptomatic internal carotid artery disease. For the North American Symptomatic Carotid Endarterectomy (NASCET) Group. *Stroke.* 2000;31(3):631-6.
- Caplan LR, Hennerici M. Impaired clearance of emboli (washout) is an important link between hypoperfusion, embolism, and ischemic stroke. *Arch Neurol.* 1998; 55(11):1475-82.
- Onat FY, Yegen BC, Lawrence R, Oktay A, Oktay S. Mad honey poisoning in man and rat. *Rev Environ Health.* 1991;9(1):3-9.
- Ozhan H, Akdemir R, Yazici M, Gündüz H, Duran S, Uyan C. Cardiac emergencies caused by honey ingestion: a single centre experience. *Emerg Med J.* 2004;21(6):742-4.

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