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10.4103/jfcm.JFCM_83_19

Cardiac arrest and stroke due to unsupervised use of herbal preparation

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Abstract:

Despite the widespread use of herbal preparations and ongoing studies on their therapeutic potential, there are no safety standards on their usage. We report a case of a 36-year-old male patient who presented with severe muscle weakness and generalized fatigue. He had no significant medical history. Initial laboratory investigations revealed hypokalemia, hypomagnesemia, and hypophosphatemia. His condition suddenly deteriorated, and he went into cardiac arrest. He was resuscitated in accordance with advanced life support guidelines. On recovery, he had left-sided weakness and dysarthria. He underwent head computed tomography, which revealed an acute infarct in the right middle cerebral artery territory. We determined that he had developed electrolyte deficiency as a result of a recent intake of a mixture of herbs consisting of khella, barley, and frankincense for kidney stones.

Keywords:

Cardiac arrest, herbal remedy, hypokalemia, stroke

Introduction

The use of herbal remedies has increased exponentially worldwide. In the United States, the number of visits to providers of complementary and alternative medicine exceeds that to primary care physicians.^[1] In Saudi Arabia, the prevalence of herbal remedy usage has reached 76%.^[2] We describe a case of a patient who had hypokalemia and subsequent cardiac arrest and ischemic cerebral infarction resulting from a recent unsupervised intake of a mixture of herbs including khella, barley, and frankincense for kidney stones. Although these herbs have some recognized therapeutic benefits, the adverse effect of their use in excessive amounts has not been reported.

Case Report

This is a case of a 36-year-old male who presented to the emergency department with complaints of severe muscle weakness and generalized fatigue persisting for 1 week.

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He had noticed a gradual worsening of symptoms over the previous 3 days, as he needed more frequent rest breaks. He was a laborer with unremarkable medical, surgical, family, and social history. He was not taking any daily medication. He was afebrile, and his blood pressure, pulse rate, and respiratory rate were 128/76 mmHg, 85 beats/min, and 12 breaths/min, respectively. The muscle strength of his proximal muscles was grade 3/5. His reflexes and sensation were intact. The rest of the examination results were unremarkable.

Shortly after his presentation to the emergency department and prior to any intervention, he had experienced severe intractable nausea and vomiting followed by cardiac arrest. His initial cardiac rhythm was characterized by pulseless ventricular tachycardia followed by ventricular fibrillation. Cardiopulmonary resuscitation was performed immediately along with pharmacological intervention and defibrillation in accordance with advanced life support guidelines. After 30 min, his sinus rhythm was restored and he regained consciousness. Laboratory results revealed hypokalemia

How to cite this article: Alshammari MA, Hassan A, Alsaihati AS, Aldera FH, Alaithan HS. Cardiac arrest and stroke due to unsupervised use of herbal preparation. *J Fam Community Med* 2020;27:67-9.

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Received: 23-04-19

Revised: 26-06-19

Accepted: 16-08-19

Published: 13-01-20

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(2.1 mEq/L) with hypomagnesemia (1.5 mEq/L) and hypophosphatemia (1.5 mEq/L). Routine investigations, including calcium level, liver function, and hematological values, were within the normal limits. He was transferred to the medical intensive care unit for further management.

On recovery, he experienced left-sided weakness with facial asymmetry and dysarthria. Noncontrast computed tomography scan of the head revealed hypodensity in the right middle cerebral artery territory [Figure 1], suggesting acute infarction. Alteplase, a tissue plasminogen activator, was administered intra-arterially, causing a dramatic improvement in neurological deficits. Bedsides, transthoracic echocardiography revealed no evidence of cardiac thrombi. He was transferred to the medical ward after 5 days in the intensive care unit.

On further history-taking to evaluate the etiology of hypokalemia, we determined that he had had right flank pain 2 weeks earlier and had been told by a friend that the pain was probably related to kidney stone and could be cured with herbal remedies. He had been taking a mixture of khella (*Ammi visnaga*), barley (*Hordeum vulgare*), and frankincense (*Boswellia sacra*). He took the mixture daily in significant amounts until his present admission. He was extensively counseled about the potential adverse effects of taking medications – including herbal preparations – without seeking health-care advice.



Figure 1: Axial computed tomography scan of the head showing cortical and subcortical hypodensity in the right parieto-frontal region, indicating right middle cerebral artery territory infarction

The patient was discharged after 8 days of hospitalization. During follow-up, he was in a good state of health with no active complaints.

Discussion

The use of herbal medicines has deep roots in different cultures and religious beliefs. Herbal remedies are commonly used by people for the treatment of a wide variety of conditions.^[2]

Patients may use different herbal remedies without any medical supervision or physician prescription. A recent study by Alghamdi *et al.*^[3] in Saudi Arabia showed that 88% of patients did not consult their health-care professionals before using herbal remedies. Similarly, they found that most physicians do not ask their patients about their use of herbal remedies.

Multiple factors were found to have contributed to the increase in the use of herbal remedies, including the increased prevalence of chronic diseases and pain syndromes, the obesity epidemic, the general desire for wellness and disease prevention, and the traditional belief that they are natural and safer than conventional medications.^[1] Although numerous scientific studies have demonstrated the therapeutic effects of various herbal preparations,^[4] their improper and unsupervised use could have adverse effects, as seen in our case. Herbal remedies are considered a food product and are thus not subject to the same scrutiny and regulations as conventional medications.^[1]

Khella (*A. visnaga*), one of the herbal medicines used by our patient, has been used since ancient times to treat various ailments.^[5] Khella has the therapeutic benefit in the treatment of vitiligo; it can also increase high-density-lipoprotein cholesterol levels and act as a smooth muscle relaxant owing to its inhibitory action on calcium channels. Khella has been utilized in the treatment of angina and asthma because it causes coronary vasodilation and bronchodilation, respectively.^[6] The beneficial effect of khella in urolithiasis is explained by its ability to induce smooth muscle relaxation, to decrease the formation of calcium oxalate crystals by increasing urinary pH,^[7] and acts as a highly potent diuretic.^[8] The oral bioavailability of *A. visnaga* is almost equivalent to its intravenous bioavailability, which makes it a herb with a strong diuretic action.^[6]

The second herbal medication used by our patient was barley (*H. vulgare*). It has been used mainly in the Mediterranean and Indian cultures to treat diabetes, renal stones, and cardiac symptoms.^[9] The third herb was frankincense (*B. sacra*), which has been shown to have anti-inflammatory, anti-neoplastic,

and immunomodulatory effects.^[10] Both *H. vulgare* and *B. sacra* have been shown to have diuretic effects.^[11,12]

As all the herbs used by our patient in the form of herbal mixture were found to have diuretic effects, such herbal preparations carry the risk of hypokalemia, especially when used in combination and in such large amounts as our patient did.

Conclusion

Although herbal remedies have been used since ancient times, information related to their intake is not always sought when medical history is being taken. The present case provides valuable information on the potential hazards of unsupervised use of herbal medicines, and this information can be used to raise community awareness of the issue.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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