Geophagia Leading to Hypokalemic Quadriplegia in A Postpartum Patient

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Abstract

Pica is an eating disorder associated with ingestion of variety of non-food substances. A postpartum patient who presented with acute flaccid quadriplegia was detected to have severe hypokalemia. After extensive investigations for cause of hypokalemia, history of geophagia (clay-eating) was obtained. Approach to hypokalemia and health hazards of pica are discussed.

INTRODUCTION

The term pica is derived from a Latin word for magpie, a bird known for its peculiar eating behavior. The Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) defines pica as “the persistent eating of nonnutritive substances for a period of at least one month, without an association with an aversion to food.” Physiologic basis for various forms of pica-eating clay (geophagia), ice (pagophagia) or starch (amylophagia) is not well understood. But pica is a serious behavioural problem as it can result in significant medical sequelle. Complications of pica include heavy metal poisoning, metabolic abnormalities, intestinal obstruction, nutritional deprivation, parasitic infestations and increased risk for Alzheimer’s disease.

Quadriplegia resulting from pica is reported as case reports secondary to lead poisoning or toxoplasmosis.

CASE REPORT

A 21-year old woman presented with history of sudden onset weakness of lower limbs followed by upper limbs in six hours, which progressed rapidly in the next 24 hours. There was history of tingling and pain of both legs for three days prior to onset of weakness. There was no history of cranial nerve weakness or sensory loss. She had vomiting on and off since last one month. There was no prior similar episode and she denied ingestion of any drugs. She had delivered a low birth weight male child 2 months back. It was her first pregnancy. On examination she was afebrile with pulse of 76 beats per minute, BP was 112/70mmHg. She was averagely built and had significant pallor. She also had platynychia and angular stomatitis. Neurological examination revealed normal higher functions and cranial nerves. Tone was reduced and power was 0/5 proximally and 2/5 distally in arms and legs. Deep tendon reflexes were depressed and planters were flexor. Sensory reflexes was normal. Other system examination was unremarkable.

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TTKG was > 4, which suggested excessive renal loss of K. Urinary pH was 6. Although. Negative urinary anion gap ruled out possibility of renal tubular acidosis (RTA).

In spite of high amount of supplementation of K-280meq on day 1 and 220meq on day 2, the rise in serum K was sub optimal (2.2meq). Hence serum Mg was done, which was low (1.2mmol/L). After correction with 50% MgSO4-4ml in Normal Saline over 4 hours, followed by 4ml in normal saline over 12 hours, serum potassium normalized to 4.4meq/L on day 4 along with clinical recovery of power to 5/5.

Other investigations (LFT, RFT, Blood glucose, Thyroid function tests) were normal but CBC showed iron deficiency anemia (Table 1). In view of coexistent hypokalemia and iron deficiency anemia she was asked...
Fig. 1: ECG strip of patient showing changes of hypokalemia - ST depression, T wave inversion, U waves and prolonged QT.

about pica. She revealed having consuming 50 grams of clay (‘mitti’) per day since her 3rd month of pregnancy till prior to presentation. Psychiatric reference was taken for the same and behavioral therapy was given. Her anemia was corrected with oral ferrous sulphate and folic acid therapy. She was discharged on day 7 and on follow up a month later she had normal serum potassium and had stopped eating clay.
Discussion

In the present case cause of acute flaccid quadriplegia was hypokalemia. However in the above case there was no positive family history or recurrent episodes suggesting hypokalemic periodic paralysis (HPP). Also there was no obvious diarrhea, vomiting or potassium depleting drug ingestion that could explain hypokalemia.

Hypomagnesaemia was thought to be present as inability to replete potassium in the presence of unrecognized and continuing Mg deficiency is well known. Hypomagnesaemia leads to hypokalemia by reduced functioning of Mg-dependent Na-K ATPase and increased renal loss of potassium. Patient also had significant co-existing iron deficiency anemia. Going through the literature pica with geophagia was thought as it could explain both hypokalemia and iron deficiency anemia and pica is not uncommon during pregnancy. Clay can bind with potassium in gut deplete it by acting as cation exchange resin. Geophagia was confirmed promptly on direct questioning.

In a recent survey of urban slums 31% of children with anemia had pica. Although pica is observed most frequently in children, other risk factors are family disorganization, environmental deprivation, pregnancy and epilepsy. In some societies, pica is a culturally sanctioned practice and is not considered to be pathologic. The prevalence of pica among South African women was reported to be 40% as compared to Indian (2.2%) and Caucasian (1.6%) women during pregnancy. In the southern parts of USA, pregnant women who traditionally ate substances like clay, cornstarch, ice and baking soda believed that such substances helped to prevent vomiting, cure swollen legs and ensured healthy children.

Although etiology of pica is unknown, numerous hypotheses have been advanced to explain the phenomenon, ranging from psychosocial, cultural and nutritional causes to purely biochemical origin like diminished dopaminergic neurotransmission. A more recent review suggests that pica is part of the obsessive compulsive disorder (OCD) spectrum of disease. Fortunately, in many cases pica remits with time. However, the use of selective serotonin reuptake inhibitors, referral for counseling and a formal mental health consultation may be warranted in patients with severe and refractory pica.

In the present case the association of post partum status and iron deficiency anemia with hypokalemia made it possible to detect geophagia as a cause of hypokalemia. Physicians should enquire about pica while taking dietary history in case of unexplained metabolic abnormality (hypokalemia) and nutrient deficiencies.

References