

A Case of Severe Hypokalemic Myopathy due to Clay Ingestion

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A 34 year old untreated HIV-infected black African woman with 153 CD4 cells/ μ l presented at Princess Marina Hospital, Gaborone, Botswana with a history of constipation (1 week), malaise (3 days), abdominal distension and spastic pain (2 days) and inability to walk (1 day). The patient had no history of alcohol or drug intake, trauma, fever, diarrhea, vomiting or consumption of caffeine, diuretics, laxatives, or β -agonists.

Examination revealed a moderately distended abdomen with diffuse tender-

HIV = human immunodeficiency virus

ness on deep palpation and palpable, irregular masses. Bowel sounds were present. Power (3/5) and tone were reduced in all limbs; sensation was intact. Blood pressure was normal. Blood tests showed very low potassium levels (1.7 mEq/L), normal sodium and creatinine, elevated transaminases (aspartate aminotransferase 1344 IU/L, alanine aminotransferase 498 IU/L), low albumin (2.69 g/dl), hypochromic microcytic anemia (hemoglobin 9.3 g/dl) and normal bilirubin, alkaline phosphatase and gamma glutamyl transpeptidase levels. A plain supine abdominal X-ray showed diffuse granular opacification involving the entire colon, and an abdominal ultrasound revealed multiple echogenic calcifications. An electrocardiogram showed a long QT interval with ST depression at V2, V3 and V4, and T wave inversion. Meanwhile a careful history taking revealed that the patient had

been eating anthill soil for more than 7 years. An abdominal computed tomography scan showed, marked hyperdensities involving most of the colon [Figure A], moderately dilated small bowel loops (some with large air-fluid levels) and mild diffuse mural thickness.

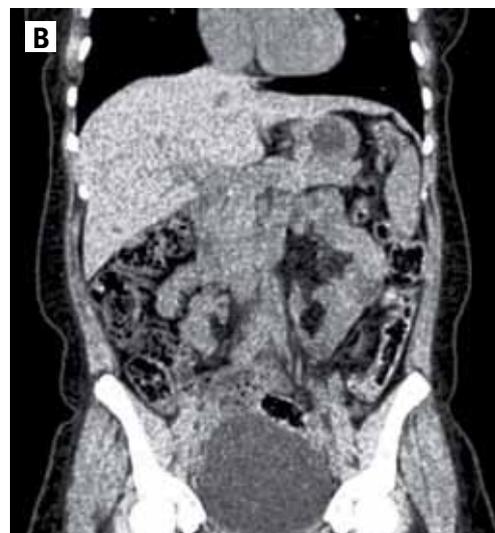
The patient was treated with potassium chloride infusions, lactulose and enemas. Three days later she started lifting her limbs and passing stools without enemas. Following physiotherapy, she mobilized independently on day 14 post-admission. A new CT scan showed only a minute, residual amount of hyperdensities in the descending colon [Figure B]. The patient was discharged with a potassium level of 3.0 mEq/L, alanine aminotransferase 543 IU/L and aspartate aminotransferase 905 IU/L.

Geophagia, i.e., the deliberate consumption of earth, soil or clay, is common in various parts of Africa. The use of soil/



[B] Abdominal CT scan 2 weeks after admission showing only minute, residual amount of hyperdensities in the descending colon

[A] Abdominal CT scan at admission showing marked hyperdensities involving most of the colon.



clay may have started as a need to suppress appetite in impoverished communities, or to treat diarrhea or pregnancy-related anemia, but today it is often due to the fact that women like the taste and texture of clay; indeed, it can lead to addiction. Geophagia can cause serious medical complications, such as hypokalemia, iron and zinc deficiency, intestinal obstruction or perforation, dental injuries, and parasitic infestations [1,2].

Clay causes increased intestinal excretion of potassium as the clay binds to potassium ions [3], leading to severe hypokalemic myopathy with rhabdomyolysis and elevated muscle enzymes (creatinase kinase and transaminases). Potassium

regulates the skeletal muscle blood flow; during muscle activity an increased potassium concentration leads to vasodilatation [4]. In a hypokalemic patient, this increase is impeded causing ischemia in the active muscle and possible necrosis and rhabdomyolysis [4]. The raised transaminases in our patient are likely due to the rhabdomyolysis. Although the possibility of a link between geophagia and liver damage has been raised, a relatively large study found no liver abnormalities in geophagic patients [5].

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Capsule

Frequency of nut consumption and mortality risk in the PREDIMED nutrition intervention trial

Prospective studies in non-Mediterranean populations have consistently related increasing nut consumption to lower coronary heart disease mortality. A small protective effect on all-cause and cancer mortality has also been suggested. To examine the association between frequency of nut consumption and mortality in individuals at high cardiovascular risk from Spain, a Mediterranean country with a relatively high average nut intake per person. Guasch-Ferre et al. evaluated 7216 men and women aged 55 to 80 years randomized to one of three interventions (Mediterranean diets supplemented with nuts, olive oil, or control diet) in the PREDIMED ('PREvención con Dieta MEDiterránea') study. Nut consumption was assessed at baseline and mortality was ascertained by medical records and linkage to the

National Death Index. During a median follow-up of 4.8 years, 323 total deaths, 81 cardiovascular deaths and 130 cancer deaths occurred. Nut consumption was associated with a significantly reduced risk of all-cause mortality (*P* for trend < 0.05, all). Compared to non-consumers, subjects consuming > 3 servings of nuts/week (32% of the cohort) had a 39% lower mortality risk (hazard ratio 0.61, 95% confidence interval 0.45–0.83). A similar protective effect against cardiovascular and cancer mortality was observed. Participants allocated to the Mediterranean diet with nuts group who consumed > 3 nut servings/week at baseline had the lowest total mortality risk (HR 0.37, 95% CI 0.22–0.66).

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Eitan Israeli

Capsule

Integrative genomics identifies APOE4 effectors in Alzheimer's disease

Late-onset Alzheimer's disease (LOAD) risk is strongly influenced by genetic factors such as the presence of the apolipoprotein E ε4 allele (referred to here as APOE4), as well as non-genetic determinants including ageing. To pursue mechanisms by which these affect human brain physiology and modify LOAD risk, Rhinn et al. initially analyzed whole-transcriptome cerebral cortex gene expression data in unaffected APOE4 carriers and LOAD patients. APOE4 carrier status was associated with a consistent transcriptomic shift that broadly resembled the LOAD profile. Differential co-

expression correlation network analysis of the APOE4 and LOAD transcriptomic changes identified a set of candidate core regulatory mediators. Several of these – including APBA2, FYN, RNF219 and SV2A – encode known or novel modulators of LOAD-associated amyloid beta A4 precursor protein (APP) endocytosis and metabolism. Furthermore, a genetic variant within RNF219 was found to affect amyloid deposition in human brain and LOAD age of onset. These data implicate an APOE4 associated molecular pathway that promotes LOAD.

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