

Got Milk...Alkali Syndrome

Author: Naba Asif

Introduction: Milk alkali syndrome is a form of hypercalcemia caused by excessive calcium intake. Symptoms include hypercalcemia, metabolic alkalosis, and acute kidney injury³. Milk alkali syndrome was considered a rare cause of hypercalcemia due to the emergence of histamine blockers in the 1970s and reduced need for antacids to treat peptic ulcer disease. However, new cases arise due to the widespread use of calcium supplements among elderly patients and postmenopausal women¹.

Description: A 69-year-old male with past medical history of renal cell carcinoma- status post right-sided nephrectomy, cerebrovascular accident, and benign prostatic hyperplasia presented to the hospital with severe constipation for 1 week. Additional symptoms included nausea, vomiting, and increased urinary frequency. The patient denied any abdominal pain, dysuria, fever, or chills. Upon admission, pertinent laboratory results showed creatinine: 2.9 (0.55 – 1.30 mg/dL), GFR: 32, calcium level: 14.7 (8.2 – 10 mg/dL), albumin: 3.4 (3.4-4.7 g/dL), and alkaline phosphatase: 392 (38-136 units/L). CT of the abdomen revealed large amounts of fecal matter in the colon and diverticulosis. Urinalysis showed elevated leukocyte esterase, nitrites, and WBC count. The patient was not taking any calcium-sparing drugs such as thiazide diuretics, vitamin A, or lithium. He was started on IV normal saline with a subsequent calcium level of 14.1 mg/dL. Out of concern for malignancy, extensive lab work was performed and showed gamma glutamyl transferase of 753 (5-83 units/L), ionized calcium: 1.67 (1.12- 1.32 mmol/L), PTH intact: 8.7 (14.6 – 101.3 pg/mL), 1,25- vitamin D: 73.6 (19.9-79.3 pg/mL), 25 vitamin D: 33.5 (30-100 ng/mL), and PTH-related peptide: <2.0 (ref <2.0 pmol/L). Additional values such as thyroid stimulating hormone, serum cortisol, free prostate specific antigen, kappa/lambda light chain ratio, urine protein electrophoresis, and serum protein electrophoresis all fell within normal limits and showed no evidence of multiple myeloma, prostate cancer, Addison's disease, or hyperthyroidism. Bone scintigraphy revealed no evidence of metastatic disease to the skeleton and a CT scan of the chest showed no evidence of pulmonary nodules or effusion. The patient continued with IV fluids and was given pamidronate, denosumab, and calcitonin. Four days after admission, the calcium level normalized to 9.9 mg/dL, creatinine decreased to 1.25 mg/dL, and GFR increased to 61. The patient's wife revealed he had been regularly consuming calcium containing Alka seltzer and Tums for 2.5 months. He was subsequently advised to discontinue all calcium antacids at home and was discharged after completing antibiotic therapy. The patient reported that all symptoms had resolved.

Conclusion: The patient's past medical history of renal cell carcinoma and old age was highly suggestive of cancer recurrence. This complicated the diagnosis of milk alkali syndrome and led to extensive laboratory work and imaging. The name "milk-alkali syndrome" can be misleading as calcium carbonate has replaced milk as a leading cause of hypercalcemia². Updating guidelines to replace the name with calcium alkali syndrome and to rate milk alkali syndrome higher on a list of differential diagnoses might encourage physicians to consider the condition even in the face of severe hypercalcemia and potentially reduce health care costs.

References:

1. Kaklamanos, M., & Perros, P. (2007). Milk alkali syndrome without the milk. *BMJ*, 335-397. doi:10.1136/bmj.39247.754676.BE
2. Patel, A. M., Adeseun, G. A., & Goldfarb, S. (2013). Calcium-Alkali Syndrome in the Modern Era. *Nutrients*, 5(12), 4880-4893. doi:10.3390/nu5124880
3. Wang, M., Cho, C., Gray, C., Chai, T. Y., Daud, R., & Luttrell, M. (2020). Milk-alkali syndrome: A 'quick ease' or a 'long-lasting problem'. *Endocrinology, Diabetes and Metabolism Case Reports*, 2020(1). doi:10.1530/EDM-20-0028