Severe life Threatening Hypercalcemia Post Thyroidectomy in a Patient Treated With Calcitriol and Calcium Carbonate

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Background

Post thyroidectomy patients may develop hypocalcemia secondary to stunning of parathyroid glands and subsequently low parathyroid hormone (PTH) levels. Patients are usually given calcium supplements to maintain a normal calcium level until parathyroid glands regain their function. Some physicians give 1,25-dihydroxyvitamin D (calcitriol) in addition to calcium. We hereby describe a patient who received such a combination and presented four days post thyroidectomy with life-threatening hypercalcemia and pancreatitis.

Case Presentation

A 33 year-old female, with nontoxic multi-nodular goiter underwent total thyroidectomy due to swallowing discomfort and cosmetic defect. Thyroid pathology result was benign. Baseline calcium was 10.2 mg/dl (n 8.6-10.3). She is diabetic on three medications with good control. Her surgery was uneventful and her parathyroid glands were preserved. Postoperatively her PTH level was suppressed to < 4 pg/ml (n 12-88), and the ionized calcium level was low, 1.11 mmol/l (n 1.14-1.33). She was started on calcitriol 0.5 mcg and calcium carbonate (CaCO₃) 2500 mg in liquid form, both twice daily. She was discharged home to taper her calcium supplement and calcitriol after five days. She returned to the hospital four days post-op with abdominal pain. Laboratory work up revealed triglyceride level 163 mg/dl, amylase 631 U/l (n 28-100), lipase 1293 IU/l (n 8-57) , calcium 18.7 mg/dl , ionized calcium greater than 1.91mmol/l , phosphorus 3.9 mg /dl ( n 2.4-4.7) , PTH 4 pg/ml, 25-OH Vitamin D level 22.2 ng/ml, WBC 11,500/ml, neutrophils 77 %, liver enzymes and bilirubin were normal. CT scan and ultrasound of abdomen showed ascites and pancreatitis without cholecystitis. Her calcium and calcitriol were stopped. Her condition deteriorated rapidly requiring intubation and mechanical ventilation. She was given calcitonin and IV hydration which normalized her calcium level. She developed loose stools and worsening of diabetes. She was discharged home ten days later on insulin in addition to her oral diabetes medications. Follow up after discharge showed an increase in HgA1C from 6% to 9.3% in 12 weeks and worsening diarrhea. Subsequently, she was diagnosed with pancreatic insufficiency and required pancreatic enzyme. Her diabetes improved with higher doses of insulin. Her calcium remained normal.

Discussion

Patients post thyroidectomy may develop transient hypoparathyroidism and hypocalcemia (1). Post-op calcium supplement and calcitriol use is generally acceptable (2). Calcitriol is known to increase oral calcium absorption four-fold and reduces by half the dose of calcium required to maintain physiologic level (6). Recent studies have used calcium carbonate 2-3 grams/day with calcitriol 0.5-1.0 mcg/day for treatment of post-thyroidectomy hypocalcemia (7, 8) and report the incidence of hypercalcemia in supplementation groups to be 4.5%. This patient was on calcium carbonate liquid formulation of 5000 mg per day. The absorption and bioavailability of calcium carbonate were shown to be significantly higher in formulations that dissolve faster (3). Tablet preparations that dissolve within 30 minutes of ingestion show 32% absorption while preparations that took longer time to dissolve showed absorption of 19% (3). Thus we believe that a liquid calcium carbonate formulation would have an even higher absorption rate. A calcitriol dose of 1 mcg per day has been shown to reduce hypercalcemia post thyroidectomy with good safety profile (4, 5). This patient did not have a calcitriol level drawn on admission; however her phosphorus level was normal which makes the possibility of calcitriol intoxication less likely. Pancreatitis is a known complication of hypercalcemia. In this patient, the sequelae of pancreatitis were long lasting with both exocrine and endocrine pancreatic dysfunctions.

Conclusion

Although calcium supplement is recommended post thyroidectomy, the liquid formulation in conjunction with calcitriol intake may exaggerate calcium absorption and precipitate hypercalcemia. Severe hypercalcemia can be life threatening and may result in long-term comorbidities.

References: