Severe hypercalcemia due to teriparatide

Cumali Karatoprak, Kadir Kayatas, [...], and Refik Demirtunç

Abstract

Osteoporosis that is by far the most common metabolic bone disease, has been defined as a skeletal disorder characterized by compromised bone strength predisposing a person to an increased risk of fracture. Anabolic therapy with teriparatide, recombinant human parathyroid hormone (PTH 1-34), stimulates bone formation and resorption and improves trabecular and cortical microarchitecture. Teriparatide is indicated for the treatment of men and postmenopausal women with osteoporosis who are at high risk for fracture, including those who have failed or are intolerant of previous osteoporosis therapy. In conclusion, although teriparatide seems quite effective in the treatment of osteoporosis, it may cause life-threatening hypercalcemia. Therefore, patients should be closely monitored if symptoms of hypercalcemia are present during teriparatide treatment. Sustained hypercalcemia due to teriparatide treatment can not be seen in literature so we wanted to emphasize that severe hypercalcemia may develop due to teriperatide.

KEY WORDS: Hypercalcemia, osteoporosis, teriparatide

Introduction

Osteoporosis has been defined as a skeletal disorder characterized by compromised bone strength predisposing a person to an increased risk of fracture and it is by far the most common metabolic bone disease.[1,2] Current treatment options include bisphosphonates (e.g., alendronate, risedronate, ibandronate), calcitonins, teriparatide and selective estrogen receptor modulators. Two general methods available for the treatment of osteoporosis are antiresorptive and anabolic therapies.

Anabolic therapy with teriparatide, recombinant human parathyroid hormone (PTH)(1-34), stimulates bone formation and resorption and improves trabecular and cortical microarchitecture. Teriparatide is indicated for the treatment of osteoporosis in men and post-menopausal women who are at high risk for fracture and those who have failed or are intolerant of previous osteoporosis therapy. The role of a combination of anabolic and antiresorptive therapy is unclear.[3–9] For anabolic therapy with teriparatide, the most commonly reported side effects are nausea, leg cramps and dizziness. Asymptomatic hypercalcemia has been reported in 5% of patients. Hypercalcemia is seen after 4-6 hours of its subcutaneous (SC) injection.[6]

We present here a case that had symptoms of hypercalcemia for a long time and calcium level was 14.5 mg/dl depending on the use of teriparatide before returning to normal baseline by 16-24 hours after dosing.

Case Report

A 74-year-old female patient was admitted to emergency department with dizziness, nausea and constipation. She has a history of osteoporosis for last 14 years and alendronate 70 mg once a week was administered for a period of 5 years (1996-2002). For a while her treatment was interrupted and then strontium renalate 2 g/day was given between 2002 and 2010. Seven months ago due to compression fracture seen in the lumbosacral radiography, strontium renalate was stopped and teriparatide 20 mcg/day (SC) was started on 26.04.2010. After teriparatide treatment, serum calcium, creatinine, blood urea nitrogen (BUN), 25-OH Vitamin D3 and erythrocyte sedimentation rate (ESR) were measured. Approximately 7 months later on 03.12.2010, she was admitted to the clinic with constipation, bloating, heartburn and nausea. Blood chemistry was repeated including parathyroid hormone (PTH) and teriparatide treatment was stopped. However, 6 days later on 09.12.2010, the patient was re-admitted to the emergency department due to persistent symptoms of dizziness, nausea, and constipation. Patient was hospitalized and reinvestigated and a diagnosis of severe hypercalcemia, pancytopenia and acute renal failure was made. Hypercalcemia was attributed to teriparatide therapy and treatment was started with 0.9% isotonic saline and furosemide. Tests were repeated on 12.12.2010. Patient was discharged on 14.12.2010 on recovery and improvement of symptoms. On the follow-up examination on 21.12.2010, no symptoms related to hypercalcemia were seen. Results of blood chemistry on various days are shown in Table 1.

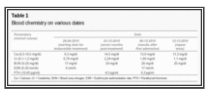

Table 1

Blood chemistry on various dates

Discussion

A number of studies have shown that teriparatide as compared with other osteoporosis treatment options is more effective in the development of vertebral and hip fractures.[5–8] However, the incidence of side effects is found to be similar to the other medications. The most common side effects associated with the use of teriparatide are injection-site rash, dizziness, nausea, muscle cramps and transient hypercalcemia.[6–11] However, a sustained hypercalcemia has not been observed.

The patient reported here had no additional disease or secondary causes of osteoporosis. After teriparatide treatment, severe hypercalcemia developed and the rise was sustained for a week after the discontinuation of teriparatide. In hypercalcemia the most important symptoms are lethargy, muscle weakness, nausea, vomiting, constipation, polyuria, anorexia, arrhythmias, hyposthenüria, dehydration, restlessness, confusion, coma, renal dysfunction and nephrogenic diabetes insipidus.[12] The patient complained of persistent symptoms of dizziness, nausea, and constipation.

We conclude that, although teriparatide seems quite effective in the treatment of osteoporosis, it may cause life-threatening hypercalcemia. Therefore, patients should be closely monitored for the symptoms of hypercalcemia during teriparatide treatment for osteoporosis. To the best of our knowledge sustained hypercalcemia due to teriparatide treatment has not been reported in the literature so far.

Footnotes

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