



Case Report

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Elderly Saudi male patient with Osteomalacia presented to ER (first presentation) with recurrent focal Seizures due to severe hypomagnesemia



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Abbreviations: ER: Emergency room; EEG: Electro Encephalo Gram; PVC: Premature Ventricular Contraction; RBBB: Right Bundle Branch Block; OPD: Out Patient Department; ECG: Electro Cardio Gram; MRC: Medical Research Council scale of muscle strength

Abstract

Vitamin D deficiency and Osteomalacia are common among Middle East and Saudi Arabia population with a higher prevalence among females than in males. Hypocalcemic Seizures secondary to severe vitamin D deficiency have been reported as an extremely rare presentation in Pediatrics and adolescents. We are presenting an elderly Saudi male patient who came to our ER with a first presentation of recurrent multifocal motor seizures.

His neurological investigations were all normal together with absence of any urinary or gastrointestinal magnesium wasting. However, his biochemical studies were constant with osteomalacia besides significant low serum magnesium. Off note, we could not find any hypomagnesemic seizures in patient with osteomalacia in our literatures search. Checking serum electrolytes including magnesium is an essential work up for all ER patients with seizures.

Introduction

The Institute of Medicine has recommended that serum 25(OH)D is adequate when it is higher than 50nmol/l [1]. However, Clinical vitamin D deficiency only occurs when serum 25(OH)D is lower than 25nmol/l.

In a review of vitamin D levels globally, vitamin D levels below 75nmol/L were prevalent in different regions of the world, whereas vitamin D levels <25nmol/L were more common in South Asia and the Middle East than in other regions [2]. Off note, the lowest serum 25(OH)D was seen in an old study of older persons in Saudi Arabia with a mean of 9nmol/l [3].

In a study between 2011 and 2016, the prevalence of vitamin D deficiency (<50nmol/l) in Saudi Arabia among different

populations (adults, children and adolescents, newborns and pregnant/lactating women) was 81.0% [4].

In the Saudi Health Interview Survey (SHIS), 62.65% of female Saudis and 40.6% of male Saudis aged 15 years and above are deficient in vitamin D. Out of them, less than 1% males and less than 2% females consume vitamin D supplements [5].

The clinical picture includes muscle weakness, bone pain and fractures, while in children joint swelling and deformations prevail. In patients with rickets and osteomalacia serum 25(OH) D usually is lower than 15nmol/l or even below the detection limit [6].

The clinical manifestations of osteomalacia may include bone pain and tenderness, muscle weakness, difficulty walking, and a waddling gait.

Case Presentation

A 63-year-old Saudi male patient was brought to ER of the IMC hospital by his companions with a history of twitching of left side of the face followed by convulsions of both left upper and lower limbs, loss of consciousness and stools incontinence. It was an acute episode occurred at home 30 minutes before reaching the hospital.

While he was in ER, another episode of twitching of left side of face and convulsions of left side of the body happened which lasted for 2 minutes. Ten minutes later, he became conscious, able to communicate and give history, yet he was complaining of headache and muscle pains.

He was complaining of left side numbness, dizziness (light headiness not spinning) and unsteadiness for two weeks preceding this attack of seizure. Consequently, he was seen by a neurologist in a private clinic and a CT brain was done which was reported normal. Because he is claustrophobic to MRI machine, MRI scan was not done.

There was no history of previous loss of consciousness, head injury or seizures. Furthermore, he did not have a history of fever, loose motions, palpitation, chest pain, sweating or shortness of breath and no gastrointestinal complaint.

Apart from mellitus type I and essential hypertension, the patient has no other medical illness or surgical procedure. His drug list includes, Lisinopril 5mg once daily orally, insulin glargine 12units subcutaneously at bed time, regular insulin 4units subcutaneously before meal and aspirin 81mg once daily orally.

He has no history of herbal medicine, alcohol or illicit drug intake. He had no family history of Epilepsy and he was not aware of any inherited disease in his family members. His pulse was 80/min and regular, BP 110/70, temperature was 36.6 C, Respiratory Rate 20/min, oxygen saturation was 98% at room air and capillary blood glucose was 9mmol/l. On examination, he had a mild facial muscles weakness on the left lower quadrant and his power on left upper and lower limb was 4/5 according to MRC scale. The rest of his neurological exam was normal together with unremarkable respiratory and cardiac review.

Serum alkaline phosphatase was high 150u/l (40-100u/l), yet the rest of liver functions including serum albumin were normal. Serum calcium was mildly low 1.90mmol/l (2.10-2.55mmol/l), serum phosphorus was also low 0.43mmol/l (0.87-1.45mmol/l), whereas serum magnesium was substantially low 0.09mmol/l (0.7mmol/l -1.45mmol/l), thus a second sample was double checked by our chemistry lab to confirm.

Vitamin D total (25OH vitamin D3+25OH vitamin D2) was

significantly low 10nmol/l (80-170nmol/l) and Para thyroid hormone was 8.0pmol/l (1.50-6.80pmol/l). Complete blood count with differential and Coagulation profile were normal. His chloride was 96mmol/l (98-111mmol/l) CO₂ venous in renal function was 22mmol (22-28mmol/l). Blood urea nitrogen was normal and serum creatinine was 111umol/l (55-110umol/l). Serum sodium, potassium, serum creatinine kinase and troponin were normal.

CT brain without contrast was normal and ECG showed normal sinus rhythm with occasional PVCs, incomplete RBBB and normal QT interval. Based on magnesium level, intravenous infusion was started in ER. The provisional diagnosis was focal seizures for investigation; as a consequence, he was reviewed and admitted by neurology team with endocrinology and internal medicine co-management. MRI brain was unremarkable and normal awake to drowsy EEG recording.

His urinary magnesium in 24 hours (sent out of hospital chemistry test) was 20 mg/24 hours (50- 250 mg/24 hours). Intravenous magnesium infusion continued with repeated serum levels of calcium, magnesium and phosphorus. He was also on oral cultrate tablets (calcium elemental 600 mg & vitamin D 400units) orally three times daily and vitamin D cholecalciferol 50.000 units once weekly.

Fortunately, the patient had not any more seizures, dizziness, muscle twitching, or weakness and he was ambulating with a good balance. His serum magnesium level improved with intravenous magnesium and he was switched to oral magnesium oxide tablets 800 mg bid. Four days later, he was discharged home on his oral medications. On internal medicine outpatient clinic follow up, his serum magnesium level was maintained and oral magnesium was stopped after 2 weeks. His vitamin D level was normalized after 5 months and his serum magnesium was normal without supplements.

Case Discussion

Hypomagnesemia is a common problem among patients admitted to hospital with a higher percentage among intensive care units' patients (up to 65%) [7]. Seizures in severely hypomagnesemic patients may be generalized tonic clonic or multifocal motor [8]. Low vitamin D level has been reported among patients with hypomagnesemia [9]. Hypocalcemic Seizures has been reported with osteomalacia in pediatrics and adult medicine [10,11].

In our electronic search, we could not find any seizures due to severe hypomagnesemia among patients with vitamin D deficiency in adults or Pediatrics. Our elderly male patient was seen in ER with first focal motor seizure. His work up showed biochemical markers for severe vitamin D deficiency osteomalacia. His serum calcium was slightly low which cannot be incriminated for the seizures, but magnesium was significantly low which is explaining the occurrence of repeated focal motor Seizures. In addition, there was no history of diarrhea or having

malabsorption symptoms to point out gastrointestinal loss. His 24 hours magnesium was normal, so magnesium urinary wasting was also rolled out.

This association between severe hypomagnesemia with osteomalacia and focal Seizures has not been reported before in literature. It is essential to check serum electrolytes including sodium, calcium and magnesium for all patients coming to ER with seizures to complete work up for seizures assessment [12].

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