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Case Report

Increase Serum Vitamin D Level In Primary Hyperparathyroidism

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Abstract

86 years old female a known case of hypertension and osteoporosis, presented in an emergency department with complains of generalized weakness for one month with relative constipation for one week and drowsiness for one day. Arterial blood gas analysis showed hypercapnic respiratory failure and chest radiograph showed bilateral infiltrates. Serum blood test analysis showed increase calcium level which was 14 mg/dl. After further workup, Vitamin D level found to be 130 ng/ml, and Parathyroid level were raised 173 pg/ml and phosphorous level 0.9 mg/dl. She was managed on lines of pneumonia and hypercalcemia secondary to primary hyperthyroidism with unusual finding of raised vitamin D level.

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Introduction

Primary hyperthyroidism is associated with decrease phosphorous level and increased serum calcium level whereas secondary hyperparathyroidism is caused by vitamin d deficiency. Here we presented a case of elderly lady presented with hypercalcemia, diagnosed as primary hyper parathyroidism on the basis of laboratory parameters. Her lab workup showed hypercalcemia along with unusual finding of increased vitamin D level upto 130 ng/ml.

Case presentation

86 year old female with known case of hypertension and osteoporosis presented in emergency department and got admitted in Specialized Care Unit. She came with complain of shortness of breath for one day, relative constipation for one week and generalized weakness for one month along with drowsiness which had been worsen for one day at time of presentation in emergency department [ED]. Due to body aches, she had checked her serum vitamin D level four months back, which was 21mol/L. On prescription by her physician, she started taking bonviva (ibrandonate) 150 mg tablet per oral /month along with her routine medication i.e. tab. Osoban D containing 177.6 mg calcium and 400 IU Vitamin D, tab. Revloc plus (Amlodipine 5mg/Cholrothiazide 12.5 mg) which she was using since 12 years.

On arrival in ED, her vitals were as follows; heart rate 60 beats per minute, Blood Pressure 135/80, respiratory Rate 26 breaths /minute, Temperature 36.7 C, Oxygen saturation 94 % on 7 litres of oxygen via face mask. Bilateral basal crackles heard on chest auscultation, Abdomen was distended but soft, the score on Glasgow Comma scale (GCS) was 11/15. Other general and systemic examination was unremarkable.

Investigations

Arterial blood Gas has been performed immediately which showed hypercapnic respiratory failure, Non-invasive ventilation applied. Chest X-ray showed bilateral infiltrates. Due to recent pandemic of COVID 19, her nasal swab for PCR sent, which was negative and COVID 19 antibody is also non-reactive. Infective marker checked, procalcitonin level was raised i.e. 1.06 ng/ml with raised white blood cell count [20 $\times 10^9$/L], however, blood and sputum cultures showed no growth.

Her initial blood serum test checked which showed hypercalcemia i.e.14 mg/dl. Relevant workup of hypercalcemia done showed as follows; Vitamin D level 130 ng/ml, Parathyroid hormone level 173 pg/ml and phosphorous level 0.9 mg/dl. This showed picture of Primary hyperparathyroidism with isolated increased in vitamin D.

To rule out other causes of hypercalcemia such as sarcoidosis, multiple myeloma, malignancy etc. (with relevance to history and examination and age) further investigation performed which were as follows; ACE level 19 U/L (normal 8-65), High Resolution CT Scan

(HRCT) done which no features of tuberculosis or sarcoidosis, protein electrophoresis level showed no M protein, CEA level and Ca-125 level were checked which were negative, levels were 3.28 ng/ml and 24 IU/ml respectively.

Thyroid function checked which were within normal limit, Ft4 level 1.34 ng/dl (normal 0.89-1.76) and TSH 0.400 uIU/ml (normal 0.5---8.9).Ultrasound neck showed bilateral nodules in both right and left lobe of thyroid gland. Sestamibi parathyroid scan planned as outpatient, once recovered from acute illness.

Treatment

Patient managed on line of Pneumonia and hypercalcemia secondary to primary hyperparathyroidism. Initially Non-invasive ventilation (NIV) support given along with oxygen therapy which gradually space out and tapper, respectively. Intravenous broad spectrum antibiotic initiated after sending blood and sputum cultures.

Her serum calcium level normalized after adequate intravenous hydration and intravenous pamidronate (bisphosphonate) given once during hospital stay. She improved clinically and GCS 15/15 with maintaining saturation upto 92-94% at room air.

Her NIV and oxygen support discontinue four day before discharge. She clinically got better and vitally stable, got shifted to ward then later discharge with clinic follow up.

Outcome and follow-up

After 8 day of hospitalization, she got discharged home with clinic follow-up and the advised Sestamibi parathyroid scan as outpatient, which is not done due to financial constraint of family.

Discussion

Increased parathyroid hormone serum level noted with increasing age; of with 10% are due to primary hyper parathyroidism.[1] In primary hyper parathyroidism, around 36%-50% of patients were found to have vitamin D deficient, In our study, the unusual finding was that the elderly female have increased vitamin D level (> 130) with primary hyper parathyroidism.[2-3] Bonjour JP et al reported that intake of 125-g servings of either vitamin D or calcium-fortified yogurt at supplemental levels of 10 μg/d vitamin D_3 and 800 mg/d calcium twice daily will increased mean vitamin D level upto 25 nmol/L in 56 days, in our case no dietary modification is done since last vitamin D level (21 mol/l) checked i.e. within last three months.[4] Leidig-Bruckner G et al 's study showed that after 3 months of supplementation of vitamin D with median dose of 800 IU /day have increased mean level of vitamin D noted 10.6 ± 20.0 nmol/L , in our case the lady taking vitamin D supplements (OSOBAN D) with 400 IU of vitamin D once daily since last 12 years with no changes in dosage in last three months.[5] The other mechanism found of increased vitamin D level in primary parathyroidism is use of bisphosphonate, Coin A et al suggested that endogenous Parathyroid hormone tend to increase along with vitamin D level while treated with bisphosphonates in postmenopausal osteoporotic women. The mean increase noted in PTH and Vitamin D level were 8 pg/ml and 11 ng/mL, respectively in 18 months of duration.[6] Similarly, Nakamura Y. et al 's study showed the long term effect of bisphosphonates (Alendronate, Risedronate and Minodronate) over 3 years, in this study patients treated with bisphosphonate alone with no vitamin D supplementation. After 3 years follow-up these patients noted to have increased in serum vitamin D level from 21.6 - 26.4 ng/mL. This probably contributed in increasing the vitamin D level in our patient as in last three months she took (bisphosphonate) Bonviva i.e. ibrandonate 150 mg film coated tablet per oral) monthly.[7]

However, no case report has been reported till date in our knowledge of increased in vitamin D level with ibrandonate treatment. A meta anaylsis done on ibrandonate therapy showed no significant difference in efficacy between oral or intravenous route of administration and parathyroid hormone levels remained unaffected.[8] Randomized Clinical Trial or further research studies recommended to find out role of ibrandonate in increasing Vitamin D level.

Conflict of interest

None

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None

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