



## ALTERNATIVE TREATMENT OF RESISTANT HYPOPARATHYROIDISM BY SUBCUTANEOUS TERIPARATIDE : A CASE REPORT

### General Medicine

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### ABSTRACT

Hypoparathyroidism usually responds to oral active vitamin D and calcium, but, although rare, some patients do not respond to this treatment. A 45-year-old male presented to our medical unit with classical oral treatment-resistant hypocalcemia, hyperphosphatemia and hypoparathyroidism. Teriparatide was given subcutaneously. In conclusion, subcutaneous injection of teriparatide is a safe and effective treatment modality to ensure normocalcemic conditions in patients with classical treatment-resistant hypoparathyroidism.

### KEYWORDS

Hypoparathyroidism; ; Teriparatide.

### INTRODUCTION:

- Hypoparathyroidism is characterized by low calcium and low parathyroid hormone (PTH) levels. Hyperphosphatemia, hypercalciuria, and reduced active vitamin D are associated with hypoparathyroidism. The main clinical features of the disease are hypocalcemic symptoms such as perioral numbness, paresthesia, and carpal muscle spasms. In addition, some severe and potentially life-threatening complications such as laryngeal spasms, tetany and seizures may occur during the course of hypoparathyroidism. The most common cause of hypoparathyroidism is accidental damage to the parathyroid glands during thyroid surgery.
- There are no formal guidelines for hypoparathyroidism management. In the acute setting, intravenous administration of calcium may be necessary. Based on current clinical evidence, the main goal of treatment is to improve the symptoms of hypocalcemia, to keep the serum calcium within the low normal range, and to avoid hypercalcemia and hypercalciuria, regardless of etiology by providing standard hypoparathyroidism treatment with oral calcium and vitamin D supplements at different doses. In 2015, the United States Food and Drug Administration (FDA) approved the use of recombinant human PTH (1-84) in treating patients with classical treatment-resistant hypoparathyroidism. It is expected that the PTH analogues would be mainstay for the treatment for regaining normal physiology. Although teriparatide, a recombinant human PTH (1-34), is widely used in the treatment of osteoporosis, there is a limited number of literature data on its use for hypoparathyroidism. A study comparing parenteral teriparatide with classical oral treatment showed that parenteral therapy was more effective in reducing hypercalciuria and improving quality of life.
- In addition, when once-daily regimen was compared with twice-daily regimen, the latter was found to be more effective. The long-term use of teriparatide was also shown to be safe and effective.

### CASE REPORT :

- A 45-year-old male patient presented with paresthesia and carpal spasm. The patient had previously undergone total thyroidectomy due to multinodular goitre two years ago. Thereafter, the patient developed postoperative hypoparathyroidism and was hospitalized several times in the emergency setting and treated for correcting hypocalcemia. He was admitted to the MEDICINE Department due to resistant hypoparathyroidism.
- On admission, his physical examination results were normal, except for thyroidectomy scars and carpal spasm and bilateral pitting pedal oedema due to severe hypoproteinaemia. The laboratory values were as follows: PTH 1.8 (15-65) pg/dL, serum calcium 6.4 (8.5-10.5) mg/dL, ionised calcium 0.65(1.12-1.32), phosphorus 5.4 (2.7-4.8) mg/dL, and albumin 2.1 (4-5)

mg/dL, TSH 1.6. Although he was on regular medication of calcitriol 6 µg/day, elemental calcium 12 g/day, oral 1,25-OH vitamin D and oral magnesium, hypocalcemia was persistent.

- Normocalcemia was achieved by parenteral calcium administration in our clinic. Celiac panel and small bowel biopsy were carried out for exclusion of malabsorption syndrome and were found to be negative. Since hypercalciuria (960 mg/day) was detected, the patient was administered thiazide diuretic. Parenteral active vitamin D was administered to the patient rather than oral vitamin D therapy. However, hypocalcemia was unable to be corrected. Therefore, teriparatide was administered.
- We initiated once daily 20 µg subcutaneous injection of recombinant human PTH (1-34). The dose was titrated up to 60 µg/day in three equal doses. However, during follow-up, after 4 months the patient experienced hypercalcemia due to this treatment. Due to the presence of hypercalcemia, the dose of teriparatide was adjusted to totally 33 µg/day teriparatide and normocalcemia was achieved. The level of 1,25-dihydroxy vitamin D level was normal during teriparatide treatment after which the patient's calcium levels improved. Oral calcium and active vitamin D requirements decreased. After several admissions to the hospital for two years, the patient was eventually discharged with this treatment. The patient did not need any additional therapy for the next seven months after discharge. TERIPARATIDE was discontinued after 1 year.

### DISCUSSION :

- Hypoparathyroidism, which does not respond to active vitamin D, is a very rare condition. The success rate of parathyroid transplantation is low worldwide, as most attempts have resulted in transplant rejection. Therefore, it seems reasonable to use PTH analogues in such patients.
- Previous use of teriparatide has focused more on non-normocalcemic effects. There are also several publications on the use of PTH analogues, since its approval by the FDA in recent years. Studies on PTH (1-34) have shown that subcutaneous administration is more effective than classical oral treatment. Meanwhile, better results were obtained with the continuous infusion via insulin pump than with the subcutaneous injection.
- In conclusion, we believe that teriparatide, a PTH analogue, provides normocalcemia with subcutaneous injection in patients with classical treatment-resistant hypoparathyroidism.

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