
Secondary hypoparathyroidism during pregnancy – A case report and review of the literature

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Summary

Secondary hypoparathyroidism is seldom seen during pregnancy. Usually, it presents with hypocalcemia. Even if there is no established therapeutic treatment, vitamin D or its analogues are required. In the present case, a 36-year-old, second gravida, with known hypoparathyroidism for the last ten years, was admitted in the prenatal clinic of “Aretaieion” University Hospital in Athens at her 39 weeks of pregnancy. She was treated with calcitriol and calcium and she was monitored monthly. She had a cesarian section and delivered a healthy female baby of 3,380 gr at 39 weeks and 1 day.

Key words: Hypoparathyroidism; Hypocalcemia; Pregnancy; Calcitriol; Calcium.

Introduction

Hypoparathyroidism is rarely seen during pregnancy and the most common cause is after injury that happens accidentally to the parathyroid glands during head and neck surgery [1, 2]. Usually, it lasts for only a short period of time in about 12% of patients undergoing surgery, but 3% of patients present permanent hypocalcemia [3, 4].

The parathyroid glands produce too little parathyroid hormone (PTH) and this causes blood calcium levels to fall and blood phosphorus levels to rise. The symptoms of hypoparathyroidism vary depending on the cause, the speed at which the condition develops, and the effectiveness of treatment [5]. Women who develop hypoparathyroidism quickly can have a tingling sensation in the hands or feet or around the mouth, such as paraesthesia, unusual muscle movements, muscle cramps, feeling tired, irritable, anxious or depressed [6].

Obviously, our target should be to maintain normocalcemia before, during, and after pregnancy, in order to avoid any adverse effects on the outcome. At every trimester of pregnancy and at regular intervals after delivery, serum calcium levels should be determined. The obstetrician and pediatrician have to collaborate and be aware of the situation [5].

Unfortunately there is no proven therapeutic management for treatment of hypoparathyroidism during pregnancy. This is particularly due to unknown usefulness of vitamin D or its analogues, as in various animal experiments have been reported teratogenic side-effects. Nevertheless, vitamin D or its analogues are necessary to control tetany predisposing to preterm labour and abortion [7, 8].

In the present article, the authors present the case of a 36-year-old female with persisted hypoparathyroidism after total thyroidectomy for cold nodules. They describe in detail the treatment strategies undertaken in this patient and their impact on the outcome of pregnancy and lactation.

Case Report

A-36-year-old gravida 2 para 1, was admitted in the antenatal clinic of Aretaieion University Hospital in Athens, Greece, at her 39 weeks of pregnancy with known hypoparathyroidism for the last ten years.

During her first pregnancy, she had an increased calcium requirement during the first two trimesters and was found to be hypocalcemic peripartum. The infant was born in July 2010 with cesarian section (c-section) and reports that she suffered a significant fall in calcium levels with developing symptoms of tetanic spasm that required urgent management.

In her second pregnancy, she changed hospital and clinician and the medication included calcitriol (0.25 µg) two tabs, one gm of calcium and 200µg L-thyroxine for her hypothyroidism daily. Serum calcium level was normal (1.9 mmol/L) and was monitored monthly. The dose of calcitriol was increased to one µg/day from 34 weeks of pregnancy. She did not mention tetanic convulsions or other symptoms during the period of her pregnancy. Elective c-section was performed at 39 weeks and one day of pregnancy. Before the surgery, serum calcium level was measured, and was found decreased, actually below 1.7 mmol/L. So, it was decided to be treated intraoperatively and until the patient was able to eat postoperatively with calcium gluconate iv diluted in a saline solution of 500 ml, in order to establish again normal levels. A female baby of 3,380 gr was delivered. Serum calcium level of baby was 2.3 mmol/L after delivery. Mother and baby were healthy at the time of discharge from the hospital. The mother was advised to continue with above dose of calcitriol and calcium and follow up was continued with her endocrinologist.

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Discussion

In normal pregnancy, it is noticed that maternal serum concentration of 1,25(OH)₂D₃ rises early in the first trimester of pregnancy, and continues to increase during the third trimester [9-12]. After delivery and especially on the third day, it decreases to a non-pregnant level [13, 14]. The reason why synthesis of 1,25(OH)₂D₃ is increased in the mother especially in the third trimester, can be explained by the high fetal uptake of calcium into the skeleton in this period of time [15].

The lack of PTH in case of hypoparathyroidism during pregnancy reduces metabolism of endogenous vitamin D to 1,25(OH)₂D₃. Substitution therapy in this case requires a compound, which bioavailability is immediate and predictable. Calcitriol, in contrast to prodrugs such as cholecalciferol and tachysterol, has a much shorter, dose-independent half-life. The risk of teratogenicity in humans and animals seems to be small as long as the concentration of serum calcium and the 1,25(OH)₂D₃ remain in lower levels [7, 15].

In the present case the maximum dose of calcitriol was 1.00 µg/day and was given after 34 weeks of pregnancy. No teratogenicity or toxicity signs were found in the outcome and serum calcium level was normal after birth.

Pitkin recommends a daily dosage of calcitriol ranging between 0.5 and 3.0 µg/day with advancing gestation in order to maintain a normal maternal serum calcium level [16].

Conclusions

In case of secondary hypoparathyroidism during pregnancy, the treatment of choice consists on supplementation of oral calcium with suggested dose of calcitriol. The normal range which serum calcium concentration should be kept is between 2.00 and 2.20 mmol/L., and generally requires a calcitriol dose between 0.25 and 3.00 µg/day. A combination of 0.25 µg/day calcitriol and one g/day of calcium supplementation should be the correct initial dose, but has to be adjusted according to the physiological requirements during pregnancy. The dosage has to be increased after the second trimester with further elevation in the third trimester. Serum calcium levels should not fall below 1.70 mmol/L. Intraoperatively and until oral intake is possible, the patients should be treated with intravenous administration of calcium gluconate with parallel frequent measurement of serum calcium levels in order to main calcium levels within the desired levels.

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