Hypocalcaemia due to hypoparathyroidism in ß-thalassemia major . A study of a new case

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Hypoparathyroïdie compliquant une ß thalassémie majeure. Une nouvelle observation.

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RÉSUMÉ

But : Rapporter un nouveau cas d' hypoparathyroïdie compliquant une ß thalassémie majeure.

Observation : Il s'agit d'une fille âgée de 17 ans, suivie pour ß thalassémie majeure qui nous consultait pour paresthésies des extrémités associées à un retard pubertaire. Les examens complémentaires avaient montré une hypocalcémie associée à une hyperphosphorémie. Le bilan hormonal avait montré une hypoparathyroïdie : PTH à 2 pg/ml (12-72). La ferritinémie moyenne était à 1770 ng/ml (6.9-323). La patiente était mise sous calcithérapie associée à la un alfa vit D3 en plus du traitement chélateur combiné. L'évolution était marquée par une amélioration clinique et biologique avec normalisation de la calcémie. L'ECG n'avait pas montré d'élargissement de l'intervalle QT.

Conclusion : La surveillance de la calcémie doit faire partie du bilan systématique des patients suivis pour ß thalassémie majeure.

Mots-clés

Hypocalcémie, hypoparathyroïdie, enfant, thalassémie

SUMMARY

Aim: To report a new case of hypoparathyroidism in a child with ß-thalassemia major

Case: We report a case of a 17-year-old Tunisian girl with transfusion-dependent thalassemia major presented with paresthesia and pubertal delay. Laboratory investigations showed hypocalcaemia and hyperphosphatemia. Parathyroid hormone level was low (2 ng/l, normal range: 12-72 ng/l) than expected for the degree of hypocalcaemia. Serum ferritin concentration was 1770ng/ml. The patient was started on oral daily calcium supplementation, Alfa calciferol and intensive iron chelation therapy. Follow-up after 6 and 12 months revealed normal Calcium and ECG showed QT interval within normal range.

Conclusion: Investigating calcium homeostasis at regular intervals and early management of any abnormality can preclude the occurrence of complications

Key-words

Hypocalcaemia, hypoparathyroidism, child, thalassemia.

Treatment with transfusion programs and chelating therapy has considerably prolonged survival in thalassemic patients [1, 2]. Such treatment however, leads to chronic iron overload and frequently to endocrine complications [3, 4].
Hypogonadotropic hypogonadism, diabetes mellitus and hypothyroidism, represent the most common endocrinopathies in thalassemia major patients [5].
Hypoparathyroidism is thought to be a rarer complication, The rarity of this condition in childhood prompted us to report this case.

CASE REPORT

S.L. is a 17-year-old thalassemic patient .She was born from non consanguineous heterozygous beta thalassemia parents. Her disease was primarily manifested by jaundice and pallor. Homozygous beta-thalassemia was diagnosed since the age of 19 months. The patient had to be started on regular periodic red cells transfusions since the age of 24months in order to maintain a pre transfusion hemoglobin level above 9g/dl. Iron-chelation therapy by Deferoxamine Mesylate (Desferal®) was started when she was about 3 years old. The dose of deferoxamine ranged from 20 to 50mg/kg body weight subcutaneously two times daily. Since the age of 9 years, Desferoxamine was administered by continuous overnight infusion with ambulatory pumps five times weekly. Long term compliance with deferoxamine therapy was poor. At the age of 14, she complained of paresthesias of the hands.
Physical examination revealed height: 154cm (-0.6SD), BMI of 18.9kg/mÇ and arterial blood pressure of 120/80mmHg. The Tanner stage I breast development and pubic hair. The Chvostek and trousseau signs were absent.
Ophtalmologic examination showed no evidence of cataract in both eyes.
Results of haematological and biological tests were as follows; serum calcium=1.56mmol/L (normal range is 2.02-2.6mmol/l); serum phosphate=2.04mmol/L (normal range is 0.8-1.61mmol/L); alkaline phosphatases=116 U/L (normal range:40-129U/L) ;serum magnesium=0.68 mmol/L (normal range is 0.6-1 mmol/L); Serum PTH was measured by radioimmunoassay=2 ng/L (normal range: 12-72ng/L); fasting glucose value = 0.9g/L; insulin and Peptide C blood levels were respectively (26 pmol/L :13 - 161 pmol/L and 1.56 μg/L: 0.8 - 4.2 μg/L); Analysis of thyroid function were normal (thyroxine=14 pM /L [normal range :11-25pM /L],thyroid stimulating hormone =2 mUI/L [normal range : 0.17-4mUI/L]); luteinising and FSH hormones were respectively (0.43 UI/L [normal range:0.5-5UI/L] and 2 UI/L [normal range:1.8-10.5UI/L]).In the GnRH test, LH and FSH peak levels were below the normal range ; prolactin level =83 mUI/L (normal range :130-610 mUI/L). Antinuclear and anti-DNA antibodies and thyroid microsomal and thyroglobulin antibodies were negative. Alanine aminotransferase= 32 IU/L; aspartate transferase=34 IU/L; mean serum ferritin value =1770ng/ml (normal range: 6.9-323 ng/ml).
Serological results were negative for B and C hepatitis. Magnetic Resonance Imaging showed a reduction of pituitary signal intensity in T2-weighted images. The patient started on Alfa calciferol (0.25 μg twice daily), oral calcium supplementations and combined iron chelation therapy with Deferasirox(75mg/kg/day) and Desferoxamine. The patient responded with both clinical and laboratory improvement. ECG showed QT interval within normal range. Calcium values were restored to the normal limit.

DISCUSSION

Hypoparathyroidism (HPT) secondary to siderosis in thalassemia patients was first described by Gabriele in 1971[6]. In the few published studies, the prevalence varies greatly from very low to as high as 22.5% [7].
The largest study on endocrine problems in thalassemia published to date including 1861 patients from 25 centers, and it recorded HPT in 3.6% of patients (mean age at diagnosis 18.7 years), although the percentage varied from center to center [8].
In most patients with ß-thalassemia major, hypoparathyroidism is asymptomatic and hypocalcaemia is detected only during routine laboratory examinations; however, in some patients hypocalcaemia can be quite severe with signs of tetany, seizures, or even cardiac failure [9, 10]. There are two possible explanations for the occurrence of hypoparathyroidism in thalassemia major patients.
The first and possibly the most important factor is the deposition of iron in parathyroid gland leading to gland dysfunction. Another factor may be suppression of parathyroid secretion induced by bone resorption resulting from increased hematopoiesis secondary to chronic anemia [9, 11]. Hypoparathyroidism in transfusion-dependant patients with beta-thalassemia seems to be accompanied by other endocrinopathies[12].
These findings are in accordance with our observation that had hypogonadotrophic hypogonadism associated with hypoparathyroidism.
As mentioned previously by several authors [11, 13], serum ferritin may not have been a reliable indicator of iron overload. It was recently demonstrated that the degree of iron overload, at least reflected by ferritin levels, was not associated with the development of other endocrine complications [14, 15].
That indicates that long-term iron balance rather than current iron status is related to the development of hyperparathyroidism.

CONCLUSION

Hypoparathyroidism is not an uncommonly observed complication in thalassemic patients and seems to be accompanied by other endocrinopathies.
Since the concentration of ferritin is not a valuable tool in the prediction of the development of hypopathyroidism, parathyroid function should be tested periodically, particularly when iron-overload complications occurs.

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