ORIGINAL RESEARCH PAPER

Medical Science

SUBTLE FACETS OF HYPERTHYROIDISM IN CHILDREN: EASY FATIGABILITY AND PALPITATION AS PRIMARY MANIFESTATIONS.

KEY WORDS:

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ABSTRACT

Background: Thyroid hormone deficiencies or excesses are known to have a wide range of impacts on different organ systems. According to the American Thyroid Association, hyperthyroidism is defined as subnormal (often undetectable) serum thyrotropin (TSH) with high serum levels of free thyroxine (FT4). With over 95% of cases, Graves' disease is the most frequent cause of hyperthyroidism, with Hashimoto's disease in children coming in second. Based on compelling scientific data, hyperthyroidism is a rare but potentially dangerous childhood illness that, if left unchecked, can cause a wide range of problems, including effects on development and growth. History, physical examination, and thyroid function test are used to diagnose hyperthyroidism based on some study evidence and consensus. **Case Report:** A 16-year-old male child presented with weakness and poor appetite along with palpitation. He was provisionally diagnosed with Iron deficiency Anaemia. Haematopoietic medication was chosen as the initial treatment for Iron Deficiency Anaemia. However, this treatment failed to normalize the patient symptoms. We further evaluated patient's thyroid profile, his TSH was significantly reduced and T3 & T4 were elevated suggestive of diffuse toxic goitre. **Conclusion:** This case report highlighted a rare case of hyperthyroidism in male child that may only manifest as easy fatiguability and palpitations.

INTRODUCTION

Hyperthyroidism (Thyrotoxicosis) is a rare but serious disorder in childhood results from excessive secretion of thyroid hormone and during childhood with few exceptions, is due to Grave's disease. Grave's disease (GD), an autoimmune disorder resulting from thyrotropin (TSH) receptor stimulation by autoantibodies (TRAb). Production of thyroid stimulating immunoglobulin results in diffuse toxic goitre.[1,2]

In children, GD is an uncommon condition that makes about 1% to 5% of all cases found across all age groups. While it can happen at any point in childhood, its frequency increases with age and peaks in puberty. In Northern Europe, the rate of GD in young children is 0.1 per 100,000 person-years, whereas in adolescents it is 3 per 100,000 person-years, with a female-to-male ratio of approximately 5:1.[3,4] Hyperthyroidism is a pathological state characterized by suppressed thyrotropin (TSH) and elevated levels of triiodothyronine (T3) and or estimated free thyroxine (free T4).[5,6]The clinical manifestation of high thyroid hormone is called thyrotoxicosis. Children who have hyperthyroidism exhibit similar signs and symptoms to adults. Hyperthyroidism is frequently found in laboratory tests associated with goitre, a typical GD symptom. Accelerated development and bone maturation as well as a decline in intellectual performance can also be consequences of childhood hyperthyroidism. Children who have a family history of autoimmune thyroid illness and those with other autoimmune disorders are more likely to have GD...[7]

Case Presentation

A 16 year old male child presented with the symptoms of palpitation, poor appetite, weight loss, fatiguability, neck swelling and breathlessness on exertion since 3 month. Since then, no relevant disease has been identified. He was complaining of lack of concentration and attentiveness. No complaints of fever, cough, nausea and vomiting.

On physical examination, his height was 170 cm, body weight was 46 kg. Pallor and low blood pressure (94/60 mmHg) were present on examination. No exophthalmos was found. There was no dysphagia or change in voice on presentation. His thyroid gland was diffusely enlarged, softly elastic, mobile, non-tender, warm and moist. Cardiovascular examination reveals increased heart rate (tachycardia HR-138 per min) without murmur. His pulmonary and abdominal examination was within normal limit.

We conducted a number of investigations to figure out the diagnosis and his intended course of study for management. We suggest CBC (Fig.i), Serum Ferritin (Fig.ii) and Iron Profile (Fig.iii), after reports there is slight derangement shown in Hb level (10.8 gm/dl), Serum Ferritin (14.80 ng/ml) and Iron Profile (IRON-Serum=33.20 µg/dl, UIBC-Serum=396 µg/dl, TIBC=429.20 µg/dl and TRANSFERRIN SATURATION=7.74). After that we further advice thyroid function test were (Fig.iv); TSH of <0.0083 µIU/ml, T3 of 5.19ng/dl and T4 of 20.33µg/ml. Another investigation that is 25 uCi ^{131}I thyroid scan (Fig.v) was done. Echocardiography (Fig.vi) and chest X-ray (Fig.vii) was normal. USG (Fig.viii) of the thyroid shows diffuse enlargement of the thyroid gland with presence of slightly decreased but homogenous coarse echo pattern diffuse increase in parenchymal vascularity is present.

Fig.(i) Complete Blood Count

Fig.(ii) Serum Ferritin

Fig.(iii) Iron Profile

Fig.(iv) Thyroid Profile

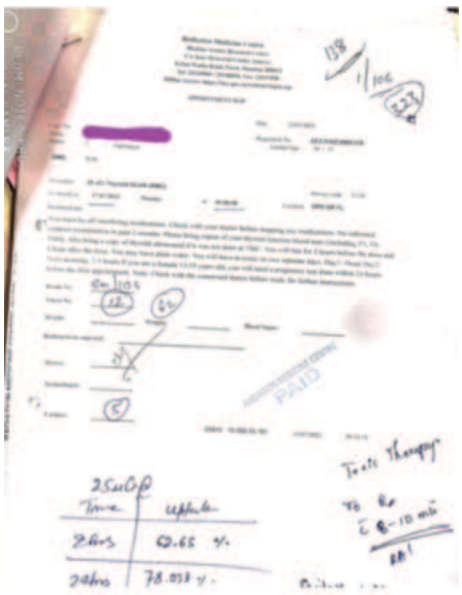

Fig.(v) 25uCi ^{131}I Thyroid scan

Fig(iv) Echocardiography

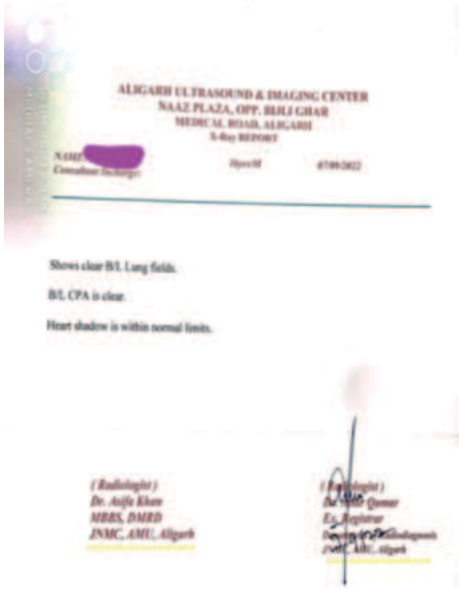

Fig.(vii) Chest X-ray

Fig.(viii) USG Thyroid

The patient has been diagnosed with Grave's disease based on both physical and laboratory examination findings. This is an extremely rare instance, given the majority of Grave's disease cases that have been recorded so far have been linked to girls.

The 3 therapeutic options for paediatric Grave's disease are antithyroid drugs (eg. propylthiouracil, methimazole, and carbimazole), radioactive iodine ablation, and thyroidectomy. During the first two weeks of treatment, the patient may have symptom relief with further β blocker treatment (unless they have asthma or heart failure). When the patient reaches euthyroidism: the medication can be discontinued. It can be taken orally twice a day at a dose of 2 mg/kg/day.

We advice Tab. Neo-Mercazole 10 one tab TDS and Tab. Ciplar-LA 20 one tab OD for 1-month.

Anti-Thyroid Drugs (ATDs)

When it comes to treating GD in children and adolescents, ATDs are typically the first choice available in most nations. The goal of treating GD with ATDs is to end the vicious cycle of autoimmune aberration and hyperthyroidism. Excessive production of Thyroid Antibodies (TRAb) can be induced by hyperthyroidism through the strengthening of autoimmune processes. The illness will progressively improve if ATD medicine disrupts this cycle and makes the patient euthyroid.Thionamides are the most widely used ATDs. Examples of these include carbimazole (CBZ), methimazole (MMI), and propylthiouracil (PTU)..[3] PTU is contradicated in children due to hepatotoxicity.[4] The active metabolite of CBZ is called MMI. Both medications inhibit the manufacture of thyroid hormone by preventing thyroid peroxidase from iodinating thyroglobulin tyrosine residues. Since the body converts CBZ to MMI almost entirely, their effects are thought to be similar at equivalent dosages.[8,9]

DISCUSSION & CONCLUSION

It was evident from his treatment history that he had taken treatment for iron deficiency anaemia there was no subsidence of the signs and symptoms. In this case study, it was observed that the patient was diagnosed with GD. Since GD is the most common cause of hyperthyroidism in children, a high index of suspicion is necessary because of the possibility of subtle and varied symptoms. This is the rare case of Graves' disease accompanied by fatigue, palpitation, weight loss and significant enlargement of thyroid gland in a young male, based on the examinations, investigation and follow-up of the patient.

In conclusion, this report described a patient who had clear biochemical features of hyperthyroidism with highly suppressed TSH levels, but ambiguous in clinical features. This example serves as a reminder to physicians that when diagnosing hyperthyroidism, careful interpretation of thyroid function test results is crucial. It also draws attention to the difficulties in identifying and treating this rare condition.

Patient consent: Verbal informed consent for publication of his clinical details was obtained from the patient's guardian.

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