

Case Report

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A rare case of thyroid storm caused by panic attack

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Abstract

Thyroid storm is an emergent medical condition which diagnosis is challenging. It is associated to many precipitating factors being emotional stress rare which makes it difficult to distinguish between thyroid storm and panic attack. Prompt treatment is life-saving. In this report, we discuss the case of a 33-year-old man brought in by ambulance after knowing the disease of his daughter could be expected to worsen and initially his condition was misdiagnosed as having severe panic attacks. Thyroid function and his symptoms strongly indicated a thyroid storm. The endocrinology department was consulted immediately and was hospitalized, where he was treated with beta-blockers, anti-thyroid medication and systemic steroids resulting in an improvement in thyroid function testing and symptoms.

Keywords: Thyroid storm; Panic attack; Propylthiouracil; Propranolol.

Abbreviations: TS: Thyroid storm; PTU: Propylthiouracil; BWPS: Burch-Wartofsky Point Scale; MMI: Metimazole.

Introduction

Thyroid storm (TS) is a rare and an emergent medical condition that is challenging to diagnose [1,2]. There are no specific laboratory abnormalities specific and the diagnosis is made based on a scoring system of clinical criteria [1]. It is a life-threatening exacerbation of the hyperthyroid state caused by multiple factors as thyroid surgery, medical exposure, diabetic ketoacidosis, infection, emotional stress and intense exercise [1,3]. TS is characterized by multi-organ decompensation resulting in tachycardia, high fever; psychosis, agitation, extreme lethargy, coma; gastrointestinal and hepatic disturbance [1-3]. The incidence is estimated to be low at 1-2% being mortality 10-30%, which is associated with shock, disseminated intravascular coagulation and multi-organ failure [1,3].

The diagnosis is challenging due to the absence of specific clinical or laboratory findings [1,3] and multiple methods have been proposed as *Burch-Wartofsky Point Scale for the Diagnosis of Thyroid Storm* and the *Japanese Thyroid Association Criteria for Thyroid Storm* [1]. Early recognition is the key, as it allows for prompt and specific treatment, as well as early identification of

organ dysfunction with initiation of supportive measures in the intensive care setting if required [3].

We present a case of TS in a patient with undiagnosed Grave's disease brought in by ambulance for agitation, tachycardia, intensive palpitations which was firstly managed as a case of panic disorder associated to an emotional stress.

Case report

A 33-year-old man with no significant past medical history present to our emergency after being with his daughter at pediatric hospital who had a disease with poor prognosis and became worst few days before. Vital signs were febrile 37.9°, tachycardic to 130 bpm, hypertensive (160/110 mmHg), restlessness with anxiety. At his initial medical examination, panic disorder was suspected, we administered diazepam 10 mg/ampoule, and he became calm. His wife revealed he lost 10 kg of weight and physical exam revealed evidence of proptosis and thyromegaly and the possibility of Grave's disease was considered, so following blood examination, thyroid function tests and neck tomographic were performed. Electrocardiogram revealed

sinus tachycardia. Computed tomography detected diffuse enlargement of thyroid gland. By this time, results from his thyroid function test revealed the following: TSH<0,005 µU/mL (0,45-3,33), free thyroxine 5.97 ng/dL (0,93-1.70), total-triiodothyronine 30 µg/dL (2.0-4.4), consistent with what would be found in a hyperfunctioning thyroid. His interval history and subsequent deterioration led us suspected to the diagnosis of a thyroid storm. Because his condition could be expected to worsen, we immediately consulted with endocrinology department and the patient was referred to them to further specialist management. We also evaluated his symptoms with the Burch-Wartofsky Point Scale (BWPS). Of his total 55 points, body temperature 10, heart rate 15, moderate agitation 20 and precipitant history 10, so thyroid storm was highly suggestive. The patient was hospitalized and the treatment started with hydrocortisone 25 mg twice a day, propranolol 60 mg every 6h, cholestyramine 5 g three times a day and propylthiouracil (PTU) 50 mg every 8h. Two weeks after discharge the patient thyroid function tests improved: thyroid stimulation hormone was 0,591 µU/mL and free thyroxine was 0,9 ng/dL. He was euthyroid and only reporting fatigue. He remained on high dose of prednisone and propranolol.

Discussion

Thyroid storm (TS), also known as thyrotoxic crisis, is a rare and potentially life-threatening endocrine disorder [4]. Due to the non-specific nature of early signs of thyroid storm, diagnosis of TS is difficult and often delayed [1]. As this way is important to know risk factors that can lead to thyroid dysfunction as being female and increased age [1]. The precipitating event for TS is related to traumatic, infectious, or surgical stressors [4]. Emotional stress-induced TS is not commonly reported as the only predisposing factor in the absence of other factors as occurred in this case [4]. The diagnosis is mostly clinical as laboratory findings cannot distinguish uncomplicated thyrotoxicosis with impending thyroid storm [3]. The Burch-Wartofsky Point Scale (BWPS) is a point-based scale that assigns points based on the presence and severity of symptoms affecting the nervous, cardiovascular or gastrointestinal system as assigns points to the presence and severity of fever and a precipitating history [1]. The score values range from 0 to 140, with a score below 25 unlikely to represent TS, a score of 25 to 44 suggesting impending storm and a score of 45 or above indicating a high likelihood of TS [1]. In this case, the patient score was 55, highly suggestive of TS, needing immediate aggressive treatment [1-4]. According to American Thyroid Association guidelines, treatments for thyroid storm are; (1) decreasing thyroid hormone secretion and synthesis, (2) blocking thyroid hormone effects in the tissue level, (3) reversal of systemic decompensation, (4) treating precipitating event/coexisting illness and (5) definitive therapy. Therapy includes PTU 500-1000 mL loading dose followed with 250 mL every 4h (PTU is more recommended than methimazole), propranolol 60-80 mL every 4h, iodine 5 drops (250 mL) every 6h and hydrocortisone 300 mL loading dose followed by 100 mL every 8h. Our patient was treated with PTU, propranolol and hydrocortisone [4]. As occurred in few cases it was difficult to distinguish between panic disorder and thyroid storm [2]. There are similar clinical symptoms such as palpitations, nausea, restlessness and weight loss being a high risk of misdiagnosis [2]. So, it is important doctors consider the possibility of severe hy-

perthyroidism as a differential diagnosis of panic disorder with severe panic attacks, testing thyroid hormone items and confirming the management of TS typically follow these principles: 1) supportive care and management of systemic complications, such as cardiorespiratory failure, and controlling precipitating factors, 2) inhibit synthesis and release of thyroid hormone, 3) control the peripheral effects of thyroid hormones [5]. For supportive care are required intravenous fluids with dextrose, oxygen, ventilatory support, correction of electrolyte abnormalities, control of cardiac arrhythmia, aggressive management of hyperthermia using acetaminophen, or physical methods of cooling. Along supportive care treatment involves inhibition of thyroid hormone synthesis, such as propylthiouracil (PTU), carbamazepine or methimazole (MMI) these last two more used because of PTU hepatic toxicity [1]. In addition to inhibition of thyroid hormone synthesis, PTU also decreases T4 to T3 conversion [1-5]. This is administered along with an iodine drug to inhibit hormone release as Potassium Iodide or Lugol's iodine [1].

Non-selective beta blockers such as propranolol, esmolol or metoprolol were found to have more direct effect on hypermetabolism and are preferred in the treatment of thyrotoxicosis [1,4,5]. Propranolol is widely used for prompt relief of sympathetic symptoms, including tremor, tachycardia, heat intolerance, and anxiety [4,5]. If beta blockers are not tolerated, calcium channel blockers such as diltiazem are an alternative for heart rate control [1,4,5].

Supplementary management includes the use of steroids, to prevent peripheral conversion of T4 into T3 as hydrocortisone or dexamethasone [1]. We can also use lithium carbonate to inhibit thyroid hormone release and potassium perchlorate to inhibit iodide transport into thyrocyte and cholestyramine to block enterohepatic circulation [1]. It is also important to treat underlying cause, any patient with a diagnosis of TS should be screened for infection, trauma myocardial infection or other triggering events [1]. Clinical improvement is expected within 12-24 h of medical treatment [5]. Further treatment, including radioactive iodine or surgery, may be employed in late phases [5]. Early thyroidectomy is the treatment of choice if medical therapy fails, or in patients who cannot take thionamides [5]. Plasmapheresis may be used as supportive therapy in preparation for thyroidectomy if the traditional measures are ineffective [1,5].

Despite many studies and case reports there are still significant gaps as there is not full understanding of the trigger of TS being a significant portion of cases with unidentifiable causes [1].

Our case focuses a patient case of TS following an emotional stress, which is rare but there are studies that suggesting association between panic disorder and presentation of TS, a phenomenon that has not been extensively explored [1,4]. A prompt recognition and treatment were life-saving. Death could have occurred if the report had been further delayed.

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