

THYROID STORM; A RARE BUT LIFE THREATENING ILLNESS

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ABSTRACT

Thyroid storm is caused by the excess of thyroid hormone; it is a rare as well as fatal condition. The most effective way to decrease the mortality and morbidity caused by this disease is to diagnose it as soon as possible. The presenting features comprise a multitude of non-specific symptoms such as high fever, tachycardia, heart failure, gastrointestinal upsets, delirium, and coma. We presented a unique incident of thyroid storm in a middle aged woman who was admitted for high fever, confusion and atrial fibrillation. Clinical diagnosis of thyroid storm was augmented by laboratory findings of hyperthyroidism. The patient was managed accordingly and she eventually recovered.

Keywords: Clinical, Hyperthyroidism, Thyroid storm, Thyroid hormone.

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INTRODUCTION

Thyroid storm was first described by Lahey in 1926 as “the crisis of exophthalmic goitre”¹, the reason being that mostly the patients who presented with thyroid storm already had an underlying Graves’ disease and this was the exacerbation of that underlying disease. As thyroid storm is a very rare condition, it is very difficult to find its incidence. The disease lacks specific laboratory findings and there are no universally agreed criteria for diagnosing it. About 1% to 2% of hospital admissions for thyrotoxicosis are due to thyroid storm; but according to some data incidence may be as high as 10%².

Myxedema coma and thyroid storm are thyroid emergencies associated with increased mortality. Prompt recognition of these states which represent the severe, life-threatening conditions of extremely reduced or elevated circulating thyroid hormone concentrations, respectively is necessary to initiate treatment³. Thyroid storm is a life-threatening disorder⁴.

Thyroid storm has a very varied clinical presentation which include high temperature, vomiting, cardiac arrhythmias, and impaired mental status. These patients have an increased risk of mortality and also have a prolonged stay

in hospital and intensive care unit as compared to simple thyrotoxicosis⁵. The range of mortality causes by thyroid storm is 10% to 20%⁶.

CASE REPORT

A 40-year-old female from some far off village of middle Punjab was brought to a peripheral military hospital in a critical state with a five day history of high fever, restlessness and altered behavior. She was found to be confused, restless, violent and mute. Blood pressure was found to be 100/60 mmHg, heart rate was 140 beats/min with irregularly irregular pulse. She was febrile with temperature of 103°F. General physical examination revealed a large multinodular goiter as shown in figure, mild exophthalmos, pallor and dehydration. Heart sounds were



Figure: Patient with visible goiter.

normal and chest was bilaterally clear. Her past medical and surgical history was not significant.

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Thyroid storm was clinically suspected right away; patient was admitted to ICU and started on I/V fluids, antibiotics, propranolol and sedatives. Carbimazole was added empirically at a low dose. Thyrotoxicosis was confirmed by thyroid profile showing serum T3 and T4 levels of 6.90 nmol/l and 212.39 nmol/l respectively while TSH levels were <0.05 uU/l. Her hemoglobin level was 10.8 g/dl and total leukocyte count was 18.5x10⁹/l. Serum ALT was 232 U/l. Anti HCV antibodies were positive. Serum urea was mildly raised owing to dehydration. Electrocardiography showed atrial fibrillation with fast ventricular response and ST segment depression in chest leads. Echocardiogram revealed mild to severe Tricuspid regurgitation. Her doses of carbimazole and propranolol were adjusted and digoxin as well as nitrates were added to the treatment. She gradually improved over next 10 days. Fever settled, heart rate was controlled, confusion and agitation subsided. She was discharged on 13th day of admission with advice to return for check-up after 2 weeks but was lost to follow-up.

DISCUSSION

The symptoms of thyroid storm include high temperature, tachycardia, nausea, heart failure, vomiting, jaundice, severe agitation, psychosis, diarrhea, delirium, and ultimately coma but there is no accepted criteria for its diagnosis. In 1993, Burch and Wartofsky presented a scoring system to help in the diagnosis of thyroid storm and when we applied the same criteria on our patient we found that our patient had many of the similar findings^{6,7}. Fever is considered as the hallmark of thyroid storm and can be as high as 105-106°F which was seen in our patient and in fact was the presenting feature. Hyperthyroidism causes an increase in heart rate and left ventricular systolic and diastolic function which can cause an increase in the incidence of supraventricular tachyarrhythmias, for instance atrial fibrillation⁸ and this was the finding in our patient, she had atrial fibrillation. Considering adults, women

are affected more than men with thyroid disease and it is in agreement with our patient as she was a woman. This gender difference suggests an underlying autoimmune mechanism which is accurate for many of the thyroid illnesses such as Graves' and Hashimoto's disease⁹.

The distinctive character of our case was the associated cardiac findings, caused by the toxic effects of the raised levels of thyroid hormones, particularly T3, on the heart. A decrease in the systemic vascular resistance, an increase in the heart rate, amplified left ventricular contractility, and raised blood volume all add to a state of increased cardiac output which can be as high as 300% in these hyperthyroid patients¹⁰. The combination of high fever, delirium and atrial fibrillation was the main finding in our patient of thyroid storm. Our patient showed a quick improvement in symptoms with cardiopulmonary supportive management and other treatment specific for thyroid storm.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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