A Case of Thyroid Storm

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Abstract: *A 24 year young lady presented with complaints of back pain and left flank pain for one day, which was associated with severe nausea and vomiting. She was a known case of Graves' hyperthyroidism with very poor compliance with antithyroid medication, She was found to have thyroid storm precipitated by a urinary tract infection.*

INTRODUCTION

Thyroid storm (accelerated hyperthyroidism), a rare life threatening emergency, is generally seen in patients with Graves' disease. Early detection of hyperthyroidism, due to increase availability of thyroid function tests, and improved preoperative thyroid surgery management has led to marked reduction in thyroid storm cases. The accurate incidence of thyroid storm would be difficult to determine due to the variability in diagnostic criteria. Only 1-2% hyperthyroid cases manifest as thyroid storm and the mortality range between 20-30% despite treatment. The most common precipitating cause of thyroid storm is non-concordance with prescribed antithyroid medication, which was also the case in our patients. Other precipitating factors include infection, radioiodine therapy, withdrawal of antithyroid drugs, trauma, cerebrovascular events, diabetic ketoacidosis, toxaemia of pregnancy and severe and emotional stress.

CASE REPORT

A 24 year young female presented to casualty with fever and back pain associated with severe nausea and vomiting for one day. She also complained of fever, severe palpitations, poor concentration and anxiety. She had retro- bulbar pain, redness of eyes, painful eye movement and swelling around her eyelids. She has been smoking more than 10 cigarettes per day for last four years. She was diagnosed with Graves hyperthyroidism 9 month ago. She had been compliant with medication for the past two month and had also been under tremendous stress due to post graduate examination. On examination, she was found to be restless, dehydrated, febrile (10F) and her pulse was 132/mn with blood pressure 120/76mm of Hg. She had generalized abdominal tenderness, Her thyroid was bilaterally enlarged with bruit. Eye examination revealed bilateral exophthalmoses. She had proptosis of 26mm right eye and 18 mm of left eye with diploma, without any optic involvement. She had eyelid erythema, conjunctival injection, chemosis, swelling of the carbuncle and eyelid edema. Clinical Activity Score (CAS) which describes the intensity of inflammation in graves ophalmopathy was 7, which suggested moderately severe disease and severity of eye changes showed Class 4 using the "NO SPECS" system **(Table)**. Her laboratory results showed suppressed thyroid stimulating hormone (TSH) less than 0.01 ulU/ml (0.34-5.6) with FT3 >30pg/ml (2.5-3.9) FT4>6ng/ml.(0.58-1.64) and serum creatinine 1.7mg/dl (0.6-1.3) Urine culture grew E.coli sensitive to aminoglycosides and nitrofurantoin. Based on diagnostic criteria of Burch and Wartosfky she had a total score of 80, which strongly suggestive of thyroid storm. The obvious precipitating cause was urinary tract infection in our patient who was non compliant to treatment. She was aggressively hydrated while awaiting laboratory result. She was started on carbimazole 20mg eight hourly (as propylhtiouracil was not available immediately) and propnanolol 40mg eight hourly. She was given hyrocortisone intravenously and later changed to oral steroids. Her blood pressure remained stable and her pulse rate gradually decreased with beta-blocker treament. Based on clinal presentation and later on confirmed by result, Lugol's iodine 10 drops eight hourly was given for 3days. Amikacin and subsequently nitrofurantoin was administered. She improved clinically on day 3 and was discharged on day 7. On discharge she was afebrile, resting pulse was 80/ min, and had mild tremor. she was disacharged on carbinmazole and propranolol for treatment of Graves' thyrotoxicoisis and oral steriod mainly for thyroid eye disease.

Table 1: *Diagnostic Criteria for thyroid storm*

Thermoregulatory	**Score**	**Cardiovascular**	**Score**
Temperature		Tachycardia	
99-99.9	5	99-109	5
100-100.9	10	110-119	10
101-101.9	15	120-129	15
102-102.9	20	130-139	20
103-103.9	25	140	25
>=104.0	30	Congestive hart failure	
		Mild	5
Gastrointestinal -Hepatic		Pedal edema	
Moderate	10	Moderate	
Diarrhoea		Bibasilar rales	
Nausea/Vomiting		Severe	
Abdominal Plain		Pulmonary edema	
Severe	20		
Unexplained jaundice		Atrial Fibrillation	10
CNS effect		Precipitant	
Mild	10	Negative	0
Agitation		Positive	10
Moderate	20		
Delirium			
Psychosis			
Extreme lethargy			
Severe	30		
Seizures			
Coma			

** Ascore of 45 or more is highly suggestive of thyroid storm; a score of 25 to 44 supports the diagnosis; and a score below 25 makes thyroid storm unlikely. Adapted from Burch, HB, Wartofsky, L, Endocrinaol Metab Clin North Am 1993;22:263*

DISCUSSION

Thyroid strom is a rare endocrine emergency but all clinicians should

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be aware of its clincal features and treatment so that morbidity can be avoided. It might be difficult to distinguish between the thyroid storm and infection in thyrotoxic patients as tachycardia and high fever may present in both. the definitive criteria of thyroid storm laid down by Burch and Wartosfky5 are useful (table). Thyroid crisis may be mistaken for sepsis, heat stroke, acute gastrointestinal infection or IHD especially in undianosed thyrotoxic patients. The manifestation of thyroid eye disease may coexist or may worsen with thyroid storm as in this case.

Uregent thyroid function test is a confirmatory diagnosis. treatment of thyroid storm should not be delayed if there is a high index of suspicion. Hyperglycaemia, leucocytosis, hypercalcemia may coexist. Deranged liver function tests mainlly raised alkaline phosphatase, could be due to increased osteoblastic activity in response to high bine resorption. Serum thyroid hormone level would typically show hyperthyroidism but due to sudden rise of thyroid hormone secondary to precipitating factors, patients can no longer adapt to the sudden metabolic stress.

Treatment of thyroid strom includes correction of severe thyrotoxicosis, precipitating illness and associated active thyroid eye disease. Patients should be monitored in ICU in the early phase. In this case, the patient required intravenous fluid as she was dehydrated but in cases with congestive cardiac failure, diuretics may be required. Beta-blockers control adrenergic systoms, thionamides block new hormone systhesis, iodine solution blocks the release of thyroid hormone and glucocorticoids reduce T4 toT3 conversion. Beta-blockers should be used cautiously if congestive cardiac failure is present. Among thionamides, propylthiouracil is prefered over methamizole as it also blocks peripheral T4 toT3 conversion. Iodination radio contrast iopanoic acid can also be used although it is not easily available.

Thyroid storm can be diagnosed based on Burch and Wartosfky[5] scoring system. All diagnosed cases should be managed with anti thyroid drugs, beta blockers and iodine solution along with supportive care preferably in Intensive Care Unit.

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LITERATURE REVIEW

Therapeutic Plama Exchange. *Arghya Majumdar, Head, Dept. of Nephrology, AMRI Hospital, Kolkata*

Therapeutic plasma exchange (TPE) is an extracorporeal blood purification technique designed for the removal of large molecular weight substances from the plasma. The basic premise of TPE is that removal of these substances will reduce further damage and may be removed by TPE include pathogenic autoantibody of (e.g. anti- glomerular basement membrane), immune complexes (e.g. systemic lupus erythematosus (SL). Cryoglobuline, myeloma light chains, thrombosis factors cholesterol containing lipoproteins and other putative toxic mediators.

The Canadian Apheresis Group reported that the five most common indication for therapeutic plasma exchange were thrombosis thrombocytopenia purpura myasthenia gravis, chronic inflammatory demyelinating polyneuropathy, waldenstroms macroglobulinemia and Guillian- Barre Syndrome. The indication which a Nephrologist would more commonly encounter TTP/HUS, cryoglobulinemia, Goodpasture's syndrome, ANCA associated vasculitis Acute kidney injury (AKI) due to multiple myeloma, ABO incompatible kidney transplants, focal segmental glomerulosclerosis (FSGS) (peri- transplants), Antibody mediated acute rejection (C4d+ve), etc. A review of the reported complication from over 13000 plasma exchange treatment found that adverse reaction were substantially more common with fresh frozen plasma (FFP) than with albumin replacement. The common complication are hypotension trasfusion related acute lung injury (TRALI), citrate- induce hypocalcemia and metabolic alkalosis, coagulation problems, infection, hypokalemia, drug removal, etc.

The new techniques of TPE include crofiltration heparin – mediated extracorporeal low- density lipoprotein (LDL) fibrinogen precipitation (HGLP) aogeresis thermofiltration, extracorporeal immunoadsorption and extracorporeal photopheresis.

The AMRI experience (2001-09), 29 cases : TTP-4 (one with HIV) Goodpasture's syndrome -2 Guillian- Barre syndrome -9 SLE with acrocyanosis-1 Adult atypical D-HUS-1, Myasthenic crisis -5, ADEM – 1, ANCCA associate systemic vasculitis with RPGN and DAH-3

Laparoscopic Kidney Retrieval in Donor with an Extended Crieterion : Assessing the Safety and Outcome.

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The term marginal kidney donor/ extended donor criterion is not clearly defined. In the article we assess the safely and out come of laparoscopic donor nephrectomy (LDN) in donor with an extended criterion. A retrospective analysis of our database was done between normal donor (group) and donors with extended criterion (group 2). The parameters analyzed were pre and post operative serum creatinine in donors and recipients, operative time, warm ischemia time, analgesia requirement in donors and impact of extended criteria on recipient outcome. Group I and group II had comparable nadir at 1 year in recipient. Donor with BMI more than 30 kg/m required more number ports and hospital stay. Recipients nadir creamtinine was comparable in extended and non extended indication donors. In our study LDS was found to be safe, feasible and efficacious in donor with extended indication such sa old age, BMI more than 30, multiple vessels and anatomical anomalies Recipient outcome for donors with normal vs. extended criterion was comparable at one year follow up. All donors with extended criterion levels with maintained nadir stable creatinine at two year follow up. Long term rollow up would be of interest.