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## CASE REPORT

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# Thyroid storm after cesarean section in pregnant woman with untreated hyperthyroidism.

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## ABSTRACT

Thyroid storm is a rare condition with high maternal and neonatal mortality especially when the diagnosis is missed or the management is late. A 25 - year - old woman presented with severe pre-eclampsia and was later complicated by thyroid storm after cesarean section. Despite all severe conditions, early recognition of this complication and aggressive management yielded good outcomes and reduced maternal and neonatal mortality.

**Key words:** thyroid storm, hyperthyroidism, pregnancy

Thyroid storm in pregnancy has been reported to be between 1 and 2 % of all cases of thyrotoxicosis with an incidence much higher in untreated patients.<sup>(1,2)</sup> It is a life - threatening condition, usually triggered by stressful situation, such as severe infection, severe pre-eclampsia, anemia, labor and surgery. In this situation maternal and perinatal mortality is high. With an aggressive approach the mortality has been reduced to less than 20 %.<sup>(3)</sup>

In the present report, a pregnant woman with undiagnosed thyrotoxicosis developed severe pre-eclampsia at 31 weeks gestation. Because of the severity of the condition, termination of pregnancy by cesarean section was performed. The patient developed thyroid storm after the operation, but with an aggressive management yielded good outcomes.

## Case Report

A 25-year-old primigravida woman presented at 31 weeks gestation, with headache, agitation and dyspnea for 10 days. One day prior to admission she also had high fever and orthopnea and was brought to a community hospital. Physician examination at that time revealed a blood pressure was 240 / 110 mmHg, and 3+edema. She was diagnosed as having severe pre-eclampsia. The initial treatment included intravenous MgSO<sub>4</sub> to prevent convulsion and intravenous hydralazine to control hypertension. Later on she was transferred to Chonburi hospital for prematurity intensive care.

From a review of history at Chonburi hospital, she had goiter and palpitation for 2 years. On examination her vital signs were T 37.3°c, pulse rate 110/min, blood pressure 240/110 mmHg, and

respiratory rate 36/min. Her consciousness was good, not pale, no jaundice, dyspneic, orthopneic, edema 3+. Her thyroid glands were enlarged 4 times. She had tachycardia, and fine crepitation over both lower lung fields. Her liver and spleen were not palpable. The fundus was 1/4 above umbilicus. The fetus was in vertex presentation. Fetal heart rate was 150 / min.

#### **Laboratory showed:**

CBC: Hct 37 % WBC 20, 700 cell / mm<sup>3</sup>, neutrophils 95 %, lymphocytes 5 %, Platelets 226,000 cell / mm<sup>3</sup>

UA : Alb 3+, sugar negative.

Blood sugar 173 mg / dl.

BUN / creatinine 9 / 0.8 mg / dl.

Liver function test : total bilirubin 1.0 mg / dl (0.8 -1), direct bilirubin 0.2 mg / dl (0 - 0.2), alkaline phosphatase 110 U / L (38 - 126), SGOT 35 units (8 - 40), SGPT 31 units (7 - 56)

PT 13.1 Sec control 11 - 14 Sec

PTT 39.7 Sec control 27 - 43 Sec

Diagnosis: 31 weeks pregnancy with severe pre-eclampsia

Management: The patient received conservative management with 1 gm / hr of MgSO<sub>4</sub>, 10 mg of hydralazine, 12 mg of dexamethasone and 20 mg of furosemide intravenously. An internist was consulted and the diagnosis of thyrotoxicosis was raised. Despite hydralazine given periodically, her blood pressure was still out of control. Because of the severity of the condition, termination of pregnancy by cesarean section was decided. A male infant weighing 1560 gm was delivered with apgar scores at 1 and 5 minutes of 5 and 10 respectively. The time of the operation was 50 minutes. During the operation her blood pressure was between 170 / 80 - 180 / 90 mmHg. After the operation the endotracheal tube could not be removed because of respiratory problem and had to be on respirator at the post-operative ward. Her body temperature rose to 40.2°C with a pulse rate of 100 / min and blood pressure of 190 / 100 mmHg. Her

consciousness got worse but still responded to verbal command. From these clinical features the diagnosis of thyroid storm was made. She was treated with 300 mg of PTU every 6 hours and 10 drops of Lugol's solution every 8 hours via nasogastric tube. Intravenous nitroprusside was used to control her blood pressure. One gram of ceftriaxone was also given. Later on she was transferred to the intensive care unit. On the fourth post-operative day, she could wean off respirator and intravenous nitroprusside but still remained on oral anti-hypertensive drug. Thyroid function test which was taken before anti-thyroid therapy revealed the following results: free T4 3.4 ng / dl (0.6 - 1.7), T3 449 ng / dl (52 - 160), TSH 0.007 µU / ml (0 - 4). She could be discharged from the hospital on the ninth post-operative day with 100 mg of PTU TID and 4 mg of prazosin BID. Two weeks later her blood pressure was 150 / 100 mmHg and the pulse rate was 80 / min. The results of thyroid function at this time were: free T4 1.3 ng / dl, T4 6.5 ng / dl, T3 205 ng / dl. She was treated with 100 mg of PTU BID and 40 mg of propranolol BID and was still healthy 4 months later.

Regarding the fetus, he was in the sick newborn unit after delivery. Three days later he developed neonatal jaundice, he was treated with phototherapy and got better. He remained in sick-new born unit for 28 days and was discharged with a body weight of 1700 GM.

#### **Discussion**

Thyroid storm is a life - threatening condition, usually develops in patients who have stressful situations.<sup>(3,4)</sup> The patient in this report had unrecognized signs and symptoms of thyrotoxicosis for 2 years and thus received no therapy. At 31 weeks gestation, she developed severe pre-eclampsia and with masked signs and symptoms of thyrotoxicosis. The treatments that prescribed to her were those directed to severe pre-eclampsia. But the condition did not improve, she underwent cesarean section followed by thyroid storm which was diagnosed and managed aggressively.

Thyrotoxicosis complicates about 1 in 2000

pregnancies.<sup>(5)</sup> Mild thyrotoxicosis is difficult to diagnose during pregnancy. Some helpful signs include: 1. Tachycardia that exceeds the increase associated with normal pregnancy, 2. An abnormally elevated sleeping pulse rate, 3. Thyromegaly, 4. Exophthalmos, 5. Failure in non obese woman to gain weight despite normal or increased food intake. Confirmation has been made easier by assays to determine elevated free thyroxin levels and thyrotropin levels of less than 0.05 µU/ml.<sup>(5)</sup>

The clinical diagnosis of thyroid storm is suspected in the presence of severe symptoms of hyperthyroidism, fever over 100°F and central nervous system changes including irritability, severe tremor, agitation and alteration in mental status. Cardiovascular symptoms are very pronounced, palpitation, symptom of congestive heart failure, tachyarrhythmias, including atrial fibrillation. Nausea, vomiting and diarrhea are not uncommon.<sup>(1,5,6)</sup>

Thyroid storm in pregnancy has been reported to be between 1 and 2 % of all cases of thyrotoxicosis.<sup>(1,2)</sup> With an incidence much higher in untreated patient. It appears that pregnancy carries a significant risk of hyperthyroidism. For laboratory tests in making the diagnosis of thyroid storm, serum thyroid levels are not different as compared with uncomplicated hyperthyroidism.<sup>(3)</sup>

The management of thyroid storm includes general and specific measurements.<sup>(4,7)</sup> The patient should be admitted to an intensive care unit, careful attention must be paid to maintenance of fluid and electrolytes balance. Fever control with acetaminophen reduces metabolic demands. Salicylates may displace thyroid hormone from plasma protein and thus should be avoided. Specific treatment consists of propylthiouracil, an anti-thyroid drug. Supersaturated

solution of potassium iodide (SSKI) or lugol's solution is given to inhibit the release of T3 and T4 from the thyroid gland. In the woman with a history of iodide induced anaphylaxis, lithium carbonate is given instead of iodide solution. An additional therapeutic goal is to inhibit conversion of T4 to the active T3. An effective agent is ipodate sodium. Although most authorities recommend dexamethasone. Some recommend propanolol, but this must be done with caution if there is heart failure.<sup>(5,7)</sup> A principal direction of therapy is supportive and aggressive management of serious hypertension, infection and anemia.<sup>(3,5)</sup>

Pregnancy outcome in thyrotoxic woman depends upon whether metabolic control is achieved in woman who remain hyperthyroid despite therapy and in those whose disease is untreated. There is a higher incidence of pre-eclampsia and heart failure as well as adverse perinatal outcome. Perinatal mortality in woman with thyrotoxicosis is 8-12%.<sup>(5)</sup>

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