

PROTOCOL #46 - Maternal Fetal Medicine, University of New Mexico

Thyroid Storm During Pregnancy

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I. General

- Thyroid storm is a severe and life-threatening thyrotoxicosis characterized by exaggerated symptoms of hyperthyroidism
- The most common underlying cause of thyrotoxicosis in cases of thyroid storm is Grave's Disease. Other causes include solitary toxic adenoma, toxic multinodular goiter and in rare cases hypersecretory thyroid carcinoma, thyrotropin-secreting pituitary adenoma, struma ovarii/teratoma and hCG-secreting hydatidiform mole to name a few.
- Usually precipitated by surgery, infection, trauma or labor and delivery
- Rare- occurs in only 1% of pregnant patients with hyperthyroidism
- 20-30% of all cases are fatal

II. Diagnosis

- Thyroid Storm is a clinical diagnosis. It is important to recognize the signs and symptoms and to treat immediately. The consequences if left untreated can be shock, stupor, coma or death.
- Signs and Symptoms include: hyperthermia, tachycardia, dehydration, nausea, vomiting, diarrhea, abdominal pain, diaphoresis, cardiac arrhythmias and change in mental status.
- Diagnostic Criteria Scoring System: point system developed to assess patients with severe thyrotoxicosis to determine their likelihood of having or developing thyroid storm (located at the end of this protocol).
- Labs: Elevated FT4 and FT3 with a depressed TSH
- Other possible lab findings: hyperglycemia, hypercalcemia, elevated alkaline phosphatase, leukocytosis and elevated liver enzymes
- REMEMBER: if you suspect thyroid storm, treatment should begin IMMEDIATELY, do not hold treatment waiting for thyroid lab results to return.

III. Management

1. Aggressive reversal of thyroidotoxins with antithyroid drugs (ATDs)
 - a. **Propylthiouracil (PTU)** 600-800 mg orally STAT followed by 150-200 mg by mouth every 4-6 hours; can be administered by NG tube or as rectal suppository if patient unable to take by mouth
 - b. Starting 1-2 hours after PTU administration:
Saturated solution of potassium iodide (SSKI) 2-5 drops every 8 hours or
Sodium iodide 0.5-1g IV every 8 hours or
Lugol's solution 8 drops every 6 hours or
Lithium carbonate 300 mg orally every 6 hours
 - c. **Dexamethasone** 2 mg IV or IM every 6 hours X 4 doses
 - d. **Propranolol** 20-80 mg orally every 4-6 hours or
Propranolol 1-2 mg IV every 5 minutes for a total of 6 mg, then 1-10 mg IV every 4 hours
**If patient has h/o severe bronchospasm:
Reserpine 1-5 mg IM q 4-6 hours, Guanethidine 1 mg/kg PO q 12 hours, Diltiazem 60mg PO q 6-8 hours
 - e. **Phenobarbital** 30-60 mg PO every 6-8 hours PRN for extreme restlessness
2. Supportive management of signs and symptoms:
 - a. Fluids (D5 or D10 1/2 NS)
 - b. Nutritional support
 - c. Oxygen
 - d. Antipyretics – acetaminophen (do not use salicylates)
 - e. Correction of electrolyte imbalance
3. Continuous cardiac monitoring and frequent monitoring of vital signs (ICU setting may be indicated)
4. Careful monitoring of the fetus (U/S, BPP or NST)
5. Avoid delivery unless fetal indications for delivery outweigh the risks to the women

References:

1. ACOG Practice Bulletin #32: Thyroid Disease in Pregnancy. August 2002
2. Nayak B, Burman K. Thyrotoxicosis & Thyroid Storm. Endocrinol Metab Clin N Am 35 (2006) 663-86.
3. Neale D, Cootauco A, Burrow G. Thyroid Disease in Pregnancy. Clin Perinatol 34 (2007) 543-57.
4. Waltman P, Brewer J, Lobert S. Thyroid Storm During Pregnancy, A Medical Emergency. Critical Care Nurse Vol 24 No 2, April 2004.

Diagnostic Criteria for Thyroid Storm

Diagnostic parameters	Scoring points
Thermoregulatory dysfunction	
Temperature F (C)	
99–99.9 (37.2-37.7)	5
100–100.9 (37.8-38.2)	10
101–101.9 (38.3-38.8)	15
102–102.9 (38.9-39.4)	20
103–103.9 (39.5-39.9)	25
≥104.0 (40)	30
Central nervous system effects	
Absent	0
Mild (agitation)	10
Moderate (delirium, psychosis, extreme lethargy)	20
Severe (seizures, coma)	30
Gastrointestinal-hepatic dysfunction	
Absent	0
Moderate (diarrhea, nausea/vomiting, abdominal pain)	10
Severe (unexplained jaundice)	20
Cardiovascular dysfunction	
Tachycardia (beats/minute)	
90–109	5
110–119	10
120–129	15
≥140	25
Congestive heart failure	
Absent	0
Mild (pedal edema)	5
Moderate (bibasilar rales)	10
Severe (pulmonary edema)	15
Atrial fibrillation	
Absent	0
Present	10
Precipitating event	
Absent	0
Present	10

Scoring system:

- A score of 45 or greater is highly suggestive of thyroid storm
- A score of 25–44 is suggestive of impending storm
- A score below 25 is unlikely to represent thyroid storm.

Adapted from Burch HB, Wartofsky L. Life-threatening thyrotoxicosis. Thyroid storm. *Endocrinol Metab Clin North Am* 1993;22(2):263–77.