



# **Thyroid Storm**

## **Myxedema Coma**



**Thyroid storm** is also called *Thyrotoxic crisis* is a life-threatening emergency in a patient with hyperthyroidism. Thyroid storm may be the initial symptom in a patient with hyperthyroidism that hasn't been diagnosed.

Causes:

Almost always abrupt and evoked by a stressful event, such as trauma, surgery or infection.

Less common causes (metastatic carcinoma of thyroid, pituitary tumour secreting TSH, DKA, poor compliance with antithyroid drugs).

## How it happens??

Thyroid storm develops when there's surge of thyroid hormones.

Hyperthyroidism can result from genetic and immunological factors.

Graves' disease:(The most common form of hyperthyroidism)an autoimmune process in which the body makes an antibody similar to TSH and the thyroid responds to it. Overproduction of T3 and T4 increases adrenergic activity and severe hypermetabolism results.This can rapidly lead to cardiac, sympathetic nervous system, and GIT collapse.

## **What to look for:**

- .Initially **marked tachycardia, vomiting and stupor.**
- .Irritability and restlessness.
- .Vision disturbances (diplopia).
- .Tremor.
- .Weakness.
- .Heat intolerance.
- .Angina.
- .Shortness of breath.
- .Cough
- .Swollen extremities.
- .Exophthalmos.

## Signs and symptoms: (Raise the flag)

On palpation, an enlarged thyroid may be felt. Any change in LOC and increasing temperature in a patient with hyperthyroidism should raise red flags. Fever, typically above 38C, begins insidiously and rises rapidly to a lethal level.

Without treatment, the patient may experience vascular collapse, hypotension, coma, death.

## Diagnosis:

- Serum T3 and T4 levels are elevated. -
- TSH level is decreased.
- Radioisotope scanning shows increased uptake.
- CT scan or MRI (may show pituitary lesion).
- A 12-lead ECG may show atrial fibrillation and supraventricular tachycardia.

**Treatment: Immediate treatment for a patient with thyroid storm is necessary to prevent death**

- Beta blockers to block adrenergic effects.
- Propylthiouracil and methimazole to block thyroid hormone synthesis.
- Corticosteroids to block conversion of T3 and T4.
- Avoidance of Aspirin(salicylates blocks binding of T3 and T4).
- Cooling measures(hypothermia blankets)

## Nursing considerations:

- Assess patient's LOC.
- Monitor the vital signs and institute cooling measures(hypothermia blanket)
- Monitor ECG,increased adrenergic activity produce arrhythmias
- Monitor signs of heart failure
- Monitor I.V.F and fluid and electrolyte balance
- Monitor the patient for high blood glucose (increased glycogenolysis)
- Provide quite enviromnent

## Myxedema coma

Is a life threatening disorder that progresses from hypothyroidism.

Causes:

- Pituitary failure to produce TSH
- Chronic autoimmune thyroiditis (Hashimoto's disease)
- Amyloidosis and sarcoidosis
- Inability to synthesize hormones
- Use of antithyroid hormones
- Post thyroidectomy effects
- Postradiation therapy effects

# Pathophysiology:

- Primary hypothyroidism results as a disorder of the thyroid gland.
- Secondary hypothyroidism is caused by a failure to stimulate normal thyroid function or an inability to synthesize thyroid hormones due to an iodine deficiency (usually dietary) or use of antithyroid medications.



Myxedema coma can result from either primary and secondary hypothyroidism and progresses slowly and gradually.

It's usually precipitated by:

Infection

Exposure to cold

Sedative use

Cellular metabolism decreases to a fatal level if the patient with myxedema coma is left untreated.

# Signs and symptoms:

- Periorbital edema
- Dry skin
- Thick brittle nails
- Sacral or peripheral edema
- Cardiac assessment may reveal muffled heart sounds
- Changes in the patients overall appearance (decreased mental ability, thick and dry tongue, hoarseness, slow and slurred speech)

# Assessment findings:

- .Progressive stupor
- .depressed respirations
- .hypoglycemia
- .hyponatremia
- .hypotension and bradycardia
- .severe hypothermia without shivering
- .decreased deep tendon reflexes
- .alopecia
- .rough, dry skin

## Investigations:

- =Serum T3 and T4 levels decreased.
- =Serum TSH levels increased.
- =Radioactive iodine( $^{131}\text{I}$ )reveals low levels of thyroid hormones.
- =Radioisotop scanning of thyroid tissue is used to identify ectopic thyroid tissue.
- =A CT scan, MRI, or skull X-ray may show pituitary or hypothalamic lesions.
- =Chest X-ray may show pleural effusion

# Treatment:

Rapid treatment may be necessary for patients in myxedema coma:

- I.V.Hydrocortisone and I.V. Levothyroxine (as thyroid agent).
- Possible ventilatory support if coma.
- I.V.F. Replacement.
- Warming devices.
- Maintenance thyroid replacement.

## Nursing considerations:

- >Assess patient's LOC and ability to maintain a patent airway.
- >Monitor respiratory status, O2 sat, ABGs (anticipate need for intubation).
- >Monitor vital signs and cardiac arrhythmias.
- >Monitor temperature closely (apply warming blanket).
- >Administer I.V.F, monitor fluid balance, serum electrolytes, blood glucose level
- >Administer medications(sedatives contraindicated).
- >Assess for sources of infection (blood, sputum, and urine) provide meticulous skin care