

Normal Thyroid state

TRH(hypothalamus) controls the release of TSH from the anterior pituitary(TSH release is also dependent on feedback from the circulating T4 & T3) which causes release of Thyroid hormones from the thyroid gland. Thyroid hormones released from the gland are bound reversibly to thyroglobulin proteins. The free unbound portions are active. T4 is the predominant one and is responsible for producing 80% of circulating T3.

Available tests for checking thyroid function

Free T4

Total T4

T3

Reverse T3

TSH

Thyroid auto antibodies

Interpretation of Thyroid Function Tests(British Thyroid association)

Currently the BTA does not hold the view that treatment for thyroid disease, either under- or over-active, should be commenced if patients have thyroid function test results within the normal laboratory reference range.

Thyroxine treatment together with T3 treatment, either as separate tablets or in combination tablets (e.g. Armour).

The view of the BTA is that at present there is no convincing evidence that the combination therapy will be of benefit to patients.

Both of these issues will be addressed in the forthcoming BTA/BTF/ACB Guidelines on Thyroid Function Testing.

Summary points (BMJ 2000..Dr O Reilly,s article)

There are no data on the relative importance of biochemical thyroid function tests and clinical symptoms and signs in assessing thyroid dysfunction

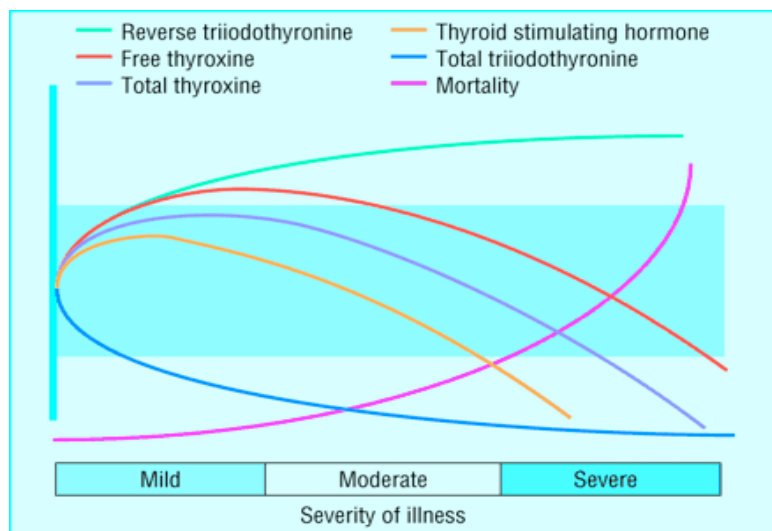
Secretion of thyroid stimulating hormone is influenced by many factors other than the negative feedback inhibition by thyroxine or triiodothyronine

Changes in thyroid stimulating hormone, thyroxine, and triiodothyronine concentrations during systemic illness are poorly understood

Thyroid function tests cannot be interpreted in patients with systemic illness

Since thyroid stimulating hormone concentrations are distributed logarithmically in the population, minor changes are unlikely to be clinically important

The possibility of false positive and false negative results should be considered in interpreting thyroid stimulating hormone concentrations



CAUSES OF HYPERTHYROIDISM

(as mentioned by J E Tintanalli)

Primary Hyperthyroidism

Graves disease

Toxic multinodular goiter

Toxic nodular(adenoma) goiter

Iodine intake

Central Hyperthyroidism

Pituitary adenoma

Thyroiditis

Subacute painful(de Quervain)

Silent subacute

Postpartum

Radiation thyroiditis

Nonthyroidal disease

Ectopic thyroid tissue(struma ovarii)

Metastatic thyroid cancer

Drug induced

Lithium

Iodine

Amiodarone

Excessive thyroid hormone ingestion(thyrotoxicosis factitia)

SYMPTOMS & SIGNS OF HYPERTHYROIDISM(as described by BTA)

•Palpitations

- Rapid and sometimes irregular heart beat (Tachycardia,Atrial Fibrillation)
- Breathlessness
- Hair loss
- Brittle nails
- Unexplained weight loss

- Swelling and or tenderness at front of throat(Thyroid bruit)
- Hyperactive behaviour. Children tend to be clumsy and drop things
- In children they may have grown faster than their peers so that their height is greater than normal for their age
- Difficulty sleeping
- Nervousness / Anxiety (hyperreflexia)
- Irritability
- Aggressive behaviour
- Sweating
- Heat intolerance
- Thirst
- Tremor in hands and fingers
- Looseness of the bowels, diarrhoea
- Weak muscles – the upper muscles of your legs and arms are most likely to be affected.
- Double vision(thyroid ophthalmopathy.... lid retraction,lid lag,proptosis)
- moist hands
- Increased appetite
- Lack of concentration and memory loss
- Eye pain, double vision (Thyroid eye disease)
- Swelling or protrusion of the eyes(proptosis,lid lag,lid retraction)
- Development of painless red lumps, usually on the shins
- In women of reproductive years the periods may become scant and sometimes can prematurely stop
- Impaired fertility
- Osteoporosis
- Low cholesterol
- High systolic blood pressure(widened pulse pressure)
- Loss of libido / impotency

THYROID STORM

The life threatening metabolic state due to hyperthyroidism.

Rare occurrence/Mortality rates 10-75%

Classically, occurs as a result of unrecognized or poorly treated hyperthyroidism

Pathophysiology not clearly understood. Increased sympathetic activity

T4 levels may not be different from patients with symptomatic uncomplicated hyperthyroidism

Presenting symptoms

Fever

Tachycardia/arrhythmia/congestive heart failure

CNS dysfunction(agitation,confusion,delirium,stupor,coma,seizure)

Precipitants of thyroid storm

Infection

Trauma
DKA
MI
PE
General surgery
Withdrawal of thyroid medication
Iodine administration
Palpation of the thyroid gland!
Ingestion of thyroid hormone
Unknown etiology in 20-25% cases

Differentials

Sepsis/heat stroke/sympathomimetic ingestion(cocaine,amphetamines)/DT's/malignant hyperthermia/malignant neuroleptic syndrome/pheocromocytosis

Treatment

ABC
Betablockers(propranolol,esmolol)..To treat severe adrenergic symptoms
Additional treatments(propylthiouracil,corticosteroids,antipyretics)
Direct removal of the thyroid hormone with plasmapheresis/exchange transfusions
Co-morbid factors need to be addressed
Supportive care