

Module 4:Hormone-Behaviour Relationship

Lecture 21: Thyroid gland

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Lecture 21:Thyroid gland

Thyroid

See video on web

Located in the neck region, this gland has to do with the basal metabolic rate. Thyroid secretes thyroxin (T4), triiodothyronine (T3) and calcitonin. Thyroxin (T4) regulates metabolic rate, thus affecting growth and development whereas calcitonin stimulates calcium deposition into bones. Hyperthyroidism results to Graves's disease which is characterized by elevated metabolic rate, excessive perspiration, rapid but irregular heartbeat, nervousness and weight loss. It can also lead to exophthalmos. This is protrusion of the eyeballs caused by edematous tissue behind the eyes. Hyperthyroidism might get reflected in the form of goiter, abnormal growth of the thyroid gland visible in the form of engorged neck. On the other hand, hypothyroidism results into cretinism which is characterized by stunted growth, thickened facial features, abnormal bone development and mental retardation. It can also lead to myxedema— low metabolic rate, lethargy, weight gain and increase in body fluids.

Thyroid secretions are significant from psychological point of view too. If not taken care of, thyroid (T4) deficiency can result into mental retardation. Abnormality in thyroid functioning have been associated with attention deficit hyperactivity disorder (ADHD). Thyroid dysfunction in adults has also been associated with emotional instability, lack of energy, memory impairment and irritability. Children with congenital hypothyroidism have been reported to have neurocognitive and behavioural impairments. The thyroid axis has a primitive role in energy homeostasis.

Several studies have explored the neurobiological correlates of suicidal behaviour. The findings suggest correlation between reduced serotonin (5-HT) and suicidal acts. Abnormalities of the adrenal and thyroid systems also play role in this. However, studies investigating relationship between suicidality and hypothalamic-pituitary-thyroid (HPT) axis activity are not yet conclusive. Calcitonin Gene-Related Peptide (CGRP) is involved in various forms of behaviour. Alteration in the CGRP level is likely to affect depression. Animal research shows that CGRP is involved in the processing of fear-related sensory information and Pavlovian fear conditioning. It also controls locomotor activities. It is also involved in the regulation of dopaminergic reward system.

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