



The Role of Thyroid Hormones in Metabolism: Effects of thyroid on Weight, Energy Levels, and Metabolic Rates

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Abstract

Background: Thyroid hormones have a crucial effect on body and cause severe body changes. It shows link between brain and body and changes that occur due to this link. Some diseases like hypothyroidism and hyperthyroidism occurs due to abnormalities in thyroid hormones and its imbalance rate may cause disorders. **Objective:** This article is showing some research related to thyroid hormones and metabolism and its effects on human body. It also shows that how thyroid hormone effects on body, weight, growth, development, brain and many other body functions. **Methods:** in this article, we study about the thyroid hormone and metabolism and its effect. We are going to check latest search on TH. Two types of hormones were released with it first one is triiodothyronine and second one thyroxine. Clinical researches are also included in this research. **Results:** this research show a strong bond between body and brain due to thyroid hormone and metabolism. It plays a significant role in controlling rate of disease. patients feel different types of changes in their bodies like Patients weight gain, poor growth, fatigue, slow development etc. But those who suffers with hyperthyroidism often exhibit increased energy, development and increased energy. **Conclusion:** thyroid hormones have strong link with metabolism and its regulation. This research helps to understand the cause of disorder, its effects and treatment. **Keywords:** TH, Metabolism, metabolic Regulation, Weight gain, disorders, development, growth.



INTRODUCTION:

The thyroid gland region of the body produces hormones. [1] Basophils helps to produce and regulate these hormones. It help to regulate several body functions. Hormones like thyroxine, used for development including brain and other body organs, weight gain/loss, growth etc. [2] A proper research is needed on thyroid hormone to save several lives.

Two most important disorders of thyroid hormones are hypothyroidism and hyperthyroidism. [3] These disorders show different body changes and effects like poor development, weight gain or loss, growth etc. This paper is written in the purpose of treating disorders and dysfunction of body tissues and metabolism. Thyroid stimulating hormone is mainly produced by the basophils which are present in the distal portion of the pituitary glands. [4] They bind themselves with tissues which help to synthesize and production of thyroid hormones. [5] TSH are present in different cytes and phages of cell. It clarifies that thyroid hormones are the one which help to link organs with brain and make a building block. Thyroid stimulating hormone regulates several thyroid functions, metabolism, development and growth of the body. [6] All these factors are including in functions of TSH. Inaccuracy leads to several disorders like thyroid cancer, hyperthyroidism, dyslipidemia etc. These hormones provide energy to tissues and glands of the body. [7] These glands include adrenals and gonads. [8] Lipids create a surface tension air present in lungs, it helps in excretion from bile and many other functions to create better nervous transmission. It also provides signals to molecules, substrates and enzymes for nuclear reception. [9] Lipids help regulate thyroid hormones and it function but irregularity cause several abnormalities. Due to these abnormalities it leads to several disorders in the body. TSH mostly influence upon body and brain. [10] It happens due to direct effect of thyroid hormones on the body and lipid. The major role of thyroid stimulating hormone in metabolism of lipid is the stimulation of hormones, its breakdown and lipids synthesis. TSH cause severe effect on brain and damage nervous system badly. TSH leads to the abnormalities including hyperthyroidism and hypothyroidism.

[11] Here we have discussed the link between brain and body due to TSH and involvement of lipid metabolism. Its functions, effects and disorders, everything is discussed. We have decided to make a latest research on TSH and the connection between brain and body. [12] We will also help to search out about the latest treatment and medication for abnormalities occur due to TSH. HDL functions can stabilize and reduce lipids and enzymes effects. Most of the abnormalities occur due to enzymes, receptors and proteins. [13] TSHR present in the liver play a key role to cholesterol level in the body. Study on mouse show the low dosage of MMI.

METHODOLOGY

This research is based on a qualitative literature review. This data is collected to check the metabolic rates and thyroid hormones effect on body. Which type of disease or disorders caused by hormonal imbalance. We focused on the studies held in last 2 years to check the latest research on thyroid hormone and its effects. There are different researches which shows deep study on thyroid hormone and its metabolism and also its effect on human body. With proper detailed research on thyroid hormone, metabolism, its regulation, effect on organs and its disorders cause several disease. We find some specific hormones like T3 and T4 which cause several changes and disorders in human body.

RESULTS:

1. Thyroid Hormones and effects on metabolic rates

T3 and T4 cause heart issues and breathing problem among patients

2. Table 1: shows the details and mechanism



Aspect	Details
TH	Thyroxine and triiodothyramine
Gland Involved	Thyroid gland (located in the neck)
Regulatory terms	Hypothalamic and Pituitary/Thyroid glands
Primarily action	It regulates metabolic rates and cause thermogenesis
Metabolic effect	It increase the consumption of oxygen and increase protein, lipids and carbohydrates
Weight	Both gain and loss in terms and conditions
Influence on Energy	Hyperthyroidism: fatigue with high activity; Hypothyroidism:

Aspect	Details
Levels	fatigue with low activity
Lipid Metabolism	It effects on cholesterol clearance
Effect on Glucose Metabolism	Enhances gluconeogenesis and glycolysis
Thermogenic Role	Increases body heat production via mitochondrial uncoupling proteins

o Studies show that individuals with hyperthyroidism have a significantly higher BMR, while those with hypothyroidism have reduced BMR.

3. **Impact on Body Weight** o Hypothyroidism cause several changes in human body which include weight gain.
 - o Hyperthyroidism often results in weight loss due to increased energy expenditure and fat catabolism.
4. **Energy Levels and Fatigue** o If level of thyroid hormones reaches to lowest level it causes severe effects. Patients start feeling lethargic and fatigue occurs. Patients feel low energy and unable to perform daily tasks also. Always feel lethargic and headache started. o **Effect of temperature and its regulation**
 - o Thyroid hormones cause the person feeling distress and in restless phase and feeling temperature.
 - o Hypothyroid individuals may experience cold intolerance, while hyperthyroid patients often feel overheated.
5. **Metabolism in macro elements** o T3 stimulates several functions in the body which generate energy for the body to work properly. Dysregulation can lead to insulin resistance or hypoglycemia depending on the type and severity of thyroid dysfunction.

6. **Table 2: Clinical and Research Insights**

Clinical Aspect	Observations
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Hyperthyroidism Symptoms	Weight loss, heat intolerance, increased appetite, insomnia, anxiety
Hypothyroidism Symptoms	Weight gain, cold intolerance, fatigue, depression, constipation
Relevant Disorders	Graves' disease (hyper), Hashimoto's thyroiditis (hypo)
Measurement of metabolic rates	Direct or indirect link, resting energy check
Treatment Effects	Levothyroxine in hypothyroid patients normalizes metabolic functions
Research Evidence	Studies show T3 directly increases mitochondrial biogenesis and energy expenditure
Therapeutic Considerations	Individualized dosing; monitor weight and BMR changes in response to treatment
Future Research Directions	Exploring tissue-specific thyroid hormone action; T3 mimetic
Clinical Aspect	Observations
	without cardiac side effects

DISCUSSION:

Thyroid hormones including thyroxine and T4 hormone show its effects on body tissues. [14] They effect internal structure of the body and T3 is the more biologically active form and is critical for increasing the number and activity of the body. Mitochondria and generation of ATP also got effect due to this disease. [15] The production of BMR increased but it also increases the level of energy in the body. Disorders which occur due to thyroid hormones cause fatigue, restlessness and low energy level among patients. On the other hand, if patient is suffering from another disorder, they will get weight gain and increased level of energy.

[16] Due to loss of weight, appetite increase and patients thought that they are taking proper diet then why they are not having proper energy and losing weight, and heat intolerance. [17] Due to this issue patient face loss of muscular strength and energy to survive.

There is a critical situation and need to thought upon it that why thyroid hormones cause that much changes in the body. Either it is important in life or not. People mostly did not care about these type of diseases and does not know about it systems specifically. [18] Due to this reason, they stay uneducated about their issues and never visit to doctors to treat their disease. Fatigue, poor development, improper vitamins, proteins and carbohydrates intake, weight loss or excessive gain cause many other diseases like hypersomnia, heart attacks, asthma etc. So, there is a need to visit doctor are per your schedule and discuss your routine issue to clarify your disease and health. In this way, most of the people will be able to save their lives.

CONCLUSION:

Thyroid hormones are very important for human body. It shows clear significance of various disease and treatment. This article shows the clear research on thyroid hormones and if it leads to abnormality it causes severe disorders which leaves harmful effects on human body. Effects of thyroid hormones abnormalities or imbalance include poor development and growth, weight loss or gain in term of specific disorder, several respiratory issues, fatigue etc.



patients start feeling restlessness and lethargic. They are even unable to perform their daily tasks. Several departments related to health and science is working on this project and showing results related to thyroid hormones and its disorders. In previous times lots of patients, we unable to get proper treatment but now as we are progressing and have treatment of almost every disease. It is easy to save millions of lives by giving them proper care and treatment.

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