Short Communication

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Endocrinology Research and Metabolism

2017
Vol.1 No.2:6

Impact of Thyroid on Liver Metabolism

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Keywords: Thyroid; Liver; Basal metabolic rate; Hormones

Received: November 02, 2017 **Accepted:** November 16, 2017 **Published:** November 25, 2017

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Citation: Khanam S (2017) Impact of Thyroid on Liver Metabolism. Endocrinol Res Metab. Vol.1 No.2:6

Introduction

Thyroid gland is an endocrine gland which secretes thyroid hormones useful for various metabolic processes in the body. It releases triiodothyronine (T3) and thyroxine (T4). Thyroid hormones regulates the basal metabolic rate (BMR) of almost all the cells such as hepatocyte cells of liver, cardiovascular function, energy balance and lipid metabolism. Disturbance in the level of thyroid hormones may alter the normal bilirubin metabolism and normal hepatic circulation.

Liver Metabolism

Thyroid hormones which are released by thyroid gland regulates different metabolic processes in the body. By increasing basal metabolic rate (BMR) thyroid hormones plays important role in regulating thermogenesis. By regulating BMR of cells in the body including hepatocytes cells which are present in liver, thyroid hormones are essential for development, growth and functions of all tissues. It also regulates lipid metabolism and cardiovascular functions [1]. Hypermetabolic condition is a state when level of thyroid hormone increases in the blood which leads to increased intake of food, weight loss and elevated level of energy expenditure [2]. Normal thyroid function depends on the presence of trace elements such as zinc, copper, iron, iodine, selenium for metabolism and synthesis of thyroid hormones [3].

Such conditions are mostly due to thyroid hormones which work directly on the target tissues like liver, heart, adipose tissue and on skeletal muscles [4,5]. Liver metabolises thyroid hormones and regulate their endocrine effects. diseases liver alter metabolism of thyroid hormones and the functions of liver may disturb due to dysfunction of thyroid gland **(Table 1 and Figure 1)**.

Table 1 Factors that affect thyroid function.

Factors that inhibit proper function of thyroid	Factors that increase T4 to Reverse triiodothyronine (RT3) conversion	Factors that contribute proper production of thyroid hormone
Some autoimmune diseases	Low calorie diet	Nutrients: Vitamin B2, B3, B6, E, C and D
Stress	Kidney and Liver dysfunction	Iodine
Infection	Toxic substances	Zinc, Selenium
Radiation	Stress	Iodine
Toxic substances: Pesticides, Cadmium, Lead	Inflammation	Iron
Fluoride which is antagonists to iodine	Infections	
Age, Pregnancy		
Drugs: dopamine, glucocorticoid		

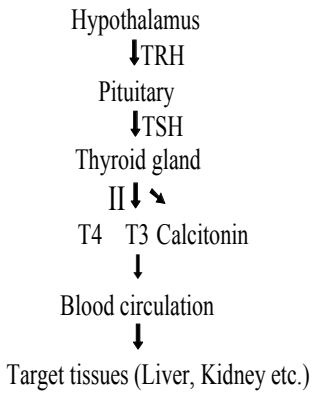

Figure 1 Release of thyroid hormones.

Conclusion

Liver plays important role in thyroid hormone metabolism. For normal bilirubin metabolism and liver function serum level is very important in blood. Liver involved in thyroid hormone excretion, conjugation and the synthesis of thyroid hormone binding globulin. Disturbance in the level of thyroid hormones may alter the normal bilirubin metabolism and normal hepatic circulation. Dysfunction of thyroid gland may disturb liver function and vice-versa [6-8].

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