Can stress cause the thyroid disease *Hypothyroidism*?

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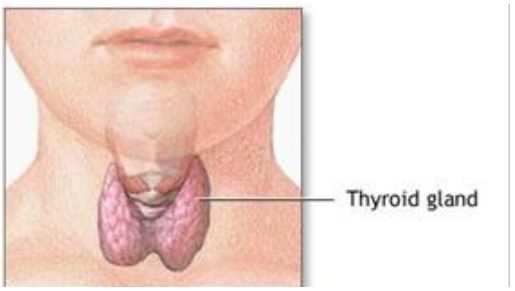
It is essential for the body that the thyroid gland functions normally. When it does not, the disease hypothyroidism can occur. The disease is common, and thanks to today's health care it is not something to worry about if you are affected, as long as you have gotten the right diagnosis. The disease is easily treated with the artificial hormone levothyroxine. This makes it possible for people affected by the disease to live a normal life.

Hypothyroidism
A thyroid hormone deficiency disease that occurs in the body when the thyroid gland is unable to produce a sufficient amount of the T3 and T4-hormones. About 0.3–3.7% of the general population in the U.S. have the disease, while the corresponding number in Europe is 0.2-5.3%.

Hypothyroidism is easily treated when diagnosed, even though the symptoms are quite diffuse. The man-made chemical levothyroxine, which imitates the T4-hormone, is really the only treatment for the disease. It has the same function as the real hormone and the dosage of the medicine is 1.5 µg/kg body weight – 1.8 µg/kg body weight.

The thyroid gland is located in the frontal part of the neck, and is the smallest gland in the human body. It is part of the endocrine system, which controls many bodily functions, and disturbance of the endocrine system may cause different illnesses. The thyroid is responsible for producing the vital hormones tetraiodothyronine (T4) and triiodothyronine (T3). There are several different symptoms from being affected by thyroid hormone deficiency; tiredness, weight gaining, and concentration issues are some examples. The reason for gaining weight is because the thyroid hormones are responsible for the proper function of the metabolism. Hypothyroidism however, is actually not a deadly disease at first. Some people can go years without realising that they have the sickness, but if it is not treated it will eventually be deadly. Stress is a factor that seems to affect the endocrine system negative, but can it directly cause hypothyroidism?



The placement of the thyroid gland [Arnavaz 2006] (https://commons.wikimedia.org/wiki/File:Thyroide.jpg)

Stress
Stress is characterized as increased adrenaline levels in the blood, which will interfere with the equilibrium of molecules between the blood and tissues. In this case, a few studied experiments on rats have shown that stress has a negative effect on the body. In one experiment, increased stress levels resulted in signs of hypothyroidism in the rats. The signs were however, restored to normal after a few weeks. The increased adrenaline levels affect the whole endocrine system, but cannot directly cause any diseases. Hypothyroidism can occur if a person already has an autoimmune disease, for example type 1 diabetes. In this case, the stress will have a greater effect inducing the disease. Because hypothyroidism is caused by a few different factors, several experiments support the conclusion that stress cannot directly cause the disease.

More information

L Malmqvist, E. 2017. Kan stress orsaka sköldkörtelsjukdomen *Hypotyreos*? Självständigt arbete i biologi, Uppsala Universitet.