

Thyroid Nodule and its Effect on Women

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Abstract -

Women are ten times more likely to suffer from thyroid disease than men. Thyroid problems increase with age and may affect adults differently than children. The incidence of most thyroid diseases: Hypothyroidism, Hyperthyroidism, and cancer is highest among postmenopausal and elderly women. Thyroid status beneficially influencing longevity relates to low thyroid function.

Keywords: Thyroid nodule, hypothyroidism, hyperthyroidism, cancer.

INTRODUCTION

Thyroid is a small gland present in the front of the neck that produces hormones to control the body's metabolism. Abnormal growth of cells in the thyroid gland forms a lump inside the gland known as the thyroid nodule [Figure 1]. Thyroid nodules are 95% benign and 5% malignant. Thyroid cancer caused due to the thyroid nodules are mostly seen in women and it is five times more frequent in menopausal people. Thyroid nodule (TN), one of the most common clinical thyroid diseases. It has been becoming increasingly widespread all over the world in the last decades. It is estimated that TN affects 4% to 7% of adults by palpation and 19% to 67% with ultrasonography, with 5 to 10% being malignant worldwide Thus, more thyroid nodule diagnoses mean more possibilities of the thyroid cancer occurrence in the future⁽¹⁾.

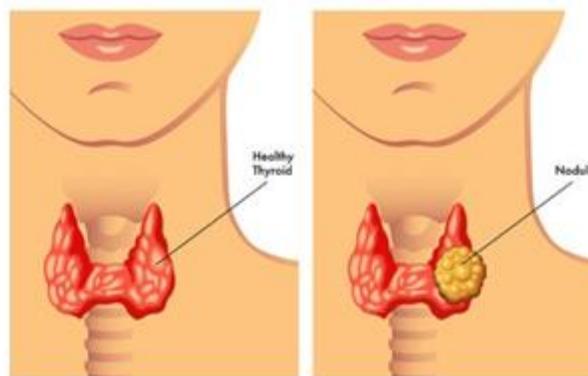


Fig. 1 Thyroid nodule

HYPOTHYROIDISM AND HYPERTHYROIDISM

Hashimoto's thyroiditis, which is the most common cause of hypothyroidism, is associated with an increased risk of thyroid nodules. Iodine deficiency is also known to cause thyroid nodules. Symptoms of hypothyroidism caused by thyroid nodules are persistent fatigue, unexplained weight gain, constipation, sensitivity to cold, dry skin and hair and brittle nails. A toxic thyroid nodule causes hyperthyroidism. This occurs when a single nodule grows on the thyroid gland causing it to become enlarged and produce excess thyroid hormones. If the increased hormone production is coming from a single nodule in the gland, this is called toxic adenoma. Symptoms of hyperthyroidism caused by thyroid nodules are rapid, irregular heartbeat, unexplained weight loss, muscle weakness, difficulty sleeping and nervousness⁽²⁾

THYROID DISORDERS IN WOMEN

The symptoms of hyperthyroidism are similar to that of menopause which includes fatigue, depression, hair loss, hot flashes, insomnia and mood swings. Thyroid disorders are more often diagnosed around the time of menopause or between the ages of 45 and 55. Carcinomas of the thyroid are three-times more frequent in women than in men. It is also seen that lower iodine content in women during pregnancy induces the growth of thyroid nodules⁽¹¹⁾

EFFECT OF ESTROGEN ON THYROID

Estrogen is a potent growth factor both for benign and malignant thyroid cells that may explain the prevalence of thyroid nodules and thyroid cancer⁽⁴⁾. Too much estrogen can block the uptake of thyroid hormones leading to symptoms of hypothyroidism. During pregnancy, iodine deficiency, the TSH receptor-stimulating effect of hCG and high estrogen levels are believed to promote growth of benign and malignant nodules.⁽⁵⁾

MENOPAUSE AND THYROID HORMONES

The menopausal transition starts with the menstrual cycle becoming longer. This changes the entire hormonal balance in the body, mainly the thyroid hormones. This causes thyroid to produce less thyroxine (T4) hormone and triiodothyroxine (T3) and more reverse triiodothyroxine (rT3) hormone. Estrogen prevents the conversion of T3 from T4 (6). Low levels of these thyroid hormones, slows the body metabolism and decreases growth or repair of many parts of the body.⁽⁷⁾

DIABETES IN THYROID DISEASES

Women with a family history of autoimmune disorders like diabetes are at a higher risk of developing more thyroid nodules. Thyroid hormones contribute to the regulation of Carbohydrate metabolism and pancreatic function, also diabetes affects thyroid function tests to variable extents. Type 1 diabetes is an autoimmune disorder. If a person already has an autoimmune disorder, they are more likely to develop another one. For people with type 2 diabetes, the risk is lower. If a person has type 2 diabetes, they are more likely to develop a thyroid disease later in life.⁽⁸⁾

TREATMENT

Treatment depends on the size and type of thyroid nodule. If the nodule is found to produce more thyroid hormones radioactive iodine is used to remove the nodule or thyroid blocking medications are given in such

cases. Ultrasound is usually done to monitor the thyroid nodule.⁽⁶⁾ Benign nodules are often monitored by ultrasounds and Biopsy is usually performed to remove the cancerous nodule or the benign nodule that may later turn cancerous. During surgery or biopsy the whole thyroid glands are sometimes removed (thyroidectomy)⁽³⁾, in such conditions synthetic thyroid hormones are given to maintain the hormone levels.

- Levothyroxine is a replacement hormone for T4 and is a treatment for hypothyroidism⁽⁹⁾
- Liothyronine is a replacement hormone for T3. This medication has a short half-life and is taken twice per day in combination with levothyroxine

CONCLUSIONS

Thyroid hormone is responsible for coordinating energy, growth and metabolism in your body. Weight changes and depression are two major symptoms that may indicate women. Prevention is better than cure. So it is better to keep in track of the thyroid functions mainly in women because:

1. Thyroid disorders cause similar symptoms to the menopause
2. Thyroid diseases like hypothyroidism, hyperthyroidism, and cancer are especially frequent in postmenopausal and elderly women

REFERENCE

1. Xiaoying Ding ,1,2 Ying Xu,3 Yufan Wang ,1 Xiaohua Li,1 Chunhua Lu,4 Jing Su,1 Yuting Chen,1 Yuhang Ma,1 Yanhua Yin,1 Yong Wu,3 Yaqiong Jin,3 Lihua Yu4 et al. Gender Disparity in the Relationship between Prevalence of Thyroid Nodules and Metabolic Syndrome Components: The SHDC-CDPC Community-Based Study. Mediators of Inflammation.: Volume 2017.
2. Kenneth A, Woeber, MD, FRCPE. Update on the management of hyperthyroidism and hypothyroidism. ARCH INTERN MED/VOL160, APR24, 2000. Pg no: 1, 4
3. Cooper DS. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. Official journal of the American Thyroid Association · November 2009. Pg no: 15
4. Ana Paula Santin1 and Tania Weber Furlanetto. Role of Estrogen in Thyroid Function and Growth Regulation. Journal of Thyroid Research. Volume 2011. Pg no: 1
5. Michael Derwahl and Diana Nicula. Estrogen and its role in thyroid cancer. Published by Bioscientifica Ltd. 2014. Pg no: 7
6. 6.Sudhir Rama Varma, Maher Al Shayeb, Abed El Kaseh, AwadAshekhi, Syed Kuduruthullah, Issmaeledin El Khader. Incidental thyroid nodules an ultrasound screening of the neck region: prevalence & risk factors. 2018. Pg no: 3
7. 7.R. Slopian, M. Owecki, A. Slopian, G. Bala, B. Meczekalski. Climacteric symptoms are related to thyroid status in euthyroid menopausal women. Journal of Endocrinological Investigation (2020). 7 August 2019. Pg no: 3, 4
8. 8.MirellaHage, Mira S. Zantout, and Sami T. Azar. Thyroid Disorders and Diabetes Mellitus. Journal of Thyroid Research · July 2011. Pg no: 2, 3
9. 9.BagherLarijani†, Mohammad Pajouhi, Mohammad HasanBastanhigh, AlirezaSadjadi, ShahrarAghakhani, FarhadZare, NahidSedighi, Mohammad Reza Eshraghian, Amir HosseinNadjafi, Mohammad Reza Amini, HosseinAdibi&Seyed Mohammad Akrami.

- 10.** Role of levothyroxine suppressive therapy for benign cold nodules of thyroid: a randomized, double-blind, placebo-controlled clinical trial. Future Drugs Ltd.2005. pg no: 3

11. 1. A. W. C. KUNG, M. T. CHAU, T. T. LAO, S. C. F. TAM, AND L. C. K. LOW. The Effect of Pregnancy on Thyroid Nodule Formation. The Journal of Clinical Endocrinology & Metabolism 87(3):1010–1014. 10 October 2020. Pg no: 4