



## THYROID NODULES

### TSH measurement is not an appropriate screening test for autonomous functioning thyroid nodules

#### BACKGROUND

Thyroid nodules are extremely common. In patients that have a normal or elevated TSH, biopsy of thyroid nodules has become standard of care for those nodules which meet size and ultrasound criteria. According to guidelines by the American Thyroid Association, if the TSH is low, typically indicating hyperthyroidism or subclinical hyperthyroidism, thyroid scanning is recommended to determine if the nodule is autonomous (hyperfunctioning). If the nodule is autonomous, biopsy is not recommended because the risk of cancer in these nodules is very low. It is unclear how frequently autonomous nodules occur in patients with normal TSH levels and whether these nodules also carry the same low likelihood of cancer. The goal of the study was to examine the frequency that autonomous nodules can exist in patients with normal thyroid function as measured by normal TSH levels.

#### THE FULL ARTICLE TITLE

Chami R et al. TSH measurement is not an appropriate screening test for autonomous functioning thyroid nodules: a retrospective study of 368 patients. *Eur J Endocrinol*. January 22, 2014 [Epub ahead of print].

#### SUMMARY OF THE STUDY

Thyroid scans can be performed with either radioactive iodine or sodium pertechnetate. The advantage of pertechnetate scans is that they can be done immediately, whereas the radioactive iodine scans take 4-6 hours. In this study 368 pertechnetate scans of the thyroid in patients that showed a functioning nodule were reviewed. The most common reason for the scanning in women was to

evaluate a thyroid nodule and in men, to evaluate thyroid function. In 217 patients where the scans, ultrasounds and TSH levels were all done within 6 months, half had a TSH below 0.4 uU/mL. The larger the thyroid nodule, the more likely a low TSH was present. However, 70% of the patients who had scans for evaluation of a thyroid nodule had normal TSH values and 49% of patients with normal TSH values were found to have an autonomous functioning nodule.

#### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests that many autonomous nodules occur in patients with normal TSH levels. It is unclear if autonomous functioning nodules in patients with normal TSH levels carried the same low enough risk of cancer to avoid biopsy as autonomous nodules in patients with low TSH levels and there was not a comparison with thyroid cytopathology to prove the low risk of cancer in these patients. Alternate approaches to the evaluation of thyroid nodules may be important due to the common nature of this problem. However, much more testing of this approach with thyroid scanning and biopsy cytology is needed.

— Julie Hallanger Johnson, MD

#### ATA THYROID BROCHURE LINKS

Thyroid Function Tests: <http://www.thyroid.org/blood-test-for-thyroid>

Thyroid Nodules: <http://www.thyroid.org/what-are-thyroid-nodules>

#### ABBREVIATIONS & DEFINITIONS

**Thyroid fine needle aspiration biopsy (FNAB):** a simple procedure that is done in the doctor's office to determine if a thyroid nodule is benign (non-cancerous) or cancer. The doctor uses a very thin needle to withdraw cells from the thyroid nodule. Patients usually return home or to work after the biopsy without any ill effects.

**Thyroid nodule:** an abnormal growth of thyroid cells that forms a lump within the thyroid. While most thyroid nodules are non-cancerous (Benign), ~5% are cancerous.

**Thyroid scan:** this imaging test uses a small amount of a radioactive substance, usually radioactive iodine



## THYROID NODULES, continued

but also pertechnetate, to obtain a picture of the thyroid gland. A “cold” nodule means that the nodule is not functioning normally. A patient with a “cold” nodule should have a fine needle aspiration biopsy of the nodule. A “functioning”, or “hot”, nodule means that the nodule is taking up radioactive substance to a degree that is either similar to or greater than the uptake of normal cells. An “autonomous” nodule is one that takes up all of the radioactive substance, with no uptake in the rest of the gland. The likelihood of cancer in these nodules is very low and a biopsy is often not needed.

**Pertechnetate thyroid scan:** This uses sodium pertechnetate –  $^{99m}\text{TcO}_4$  – instead of radioactive iodine. The advantage of pertechnetate scans is that they can be done immediately, whereas the radioactive iodine scans take 4–6 hours. However, they are less sensitive than radioactive iodine scans.

**Thyroid Ultrasound:** a common imaging test used to evaluate the structure of the thyroid gland. Ultrasound uses soundwaves to create a picture of the structure of the thyroid gland and accurately identify and characterize nodules within the thyroid. Ultrasound is also frequently used to guide the needle into a nodule during a thyroid nodule biopsy.

**TSH: thyroid stimulating hormone** — produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally

**Autonomous nodule:** A thyroid nodule that is producing thyroid hormone and lacks the usual regulation of normal thyroid tissue