CLINICAL THYROIDOLOGY **FOR PATIENTS**

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THYROID CANCER

Surgical treatment of RET mutation–positive medullary cancer can be based on measurement of calcitonin levels

BACKGROUND

Medullary thyroid cancer is a rare cancer which can occur as part of a genetic syndrome. Medullary cancer can be detected in family members by measuring calcitonin, which is a hormone produced by the cells in the thyroid gland that are abnormal in medullary cancer. Calcitonin identifies patients who already have developed cancers. A more sensitive test is a blood test looking for a mutation in the RET gene which can identify patients at risk before the cancers develop. Patients who have the RET gene mutation are called gene carriers. Early diagnosis can allow for treatment before medullary thyroid cancer becomes invasive or spreads to the lymph nodes, which increases the chance of death from the disease. It is recommended that gene carriers undergo early removal of their thyroid gland, even if there is no evidence of cancer being present. In this study the authors looked at delaying surgery in gene carriers based on calcitonin levels.

THE FULL ARTICLE TITLE

Elisei et al. The timing of total thyroidectomy in RET gene mutation carriers could be personalized and safely planned on the basis of serum calcitonin: 18 years experience at one single center. J Clin Endocrinol Metab 2012;97:426-35.

SUMMARY OF THE STUDY

This study examined 472 individuals from 103 families with medullary carcinoma. A total of 140 of these individuals had the RET gene mutation. A total of 89 individuals had already undergone thyroidectomy and 84 of these agreed to participate in the study. Calcitonin was measured before surgery before (baseline) and after stimulation with another hormone known as pentagastrin. The authors looked at three groups. In group 1, baseline calcitonin levels were elevated and the pentagastrin stimulation was positive. A total of 20 of 21 of these people had suspicious findings on neck ultrasound. In group 2, baseline calcitonin levels were normal, but the pentagastrin stimulation was positive. Group 3 had normal baseline and pentagrastrin stimulation tests.

The authors found that patients that had a calcitonin level of greater than 60 (Group 1) were typically found to spread of the cancer to the neck lymph node. When the calcitonin level was between 10 and 60 (Group 2), the cancer was usually confined to the thyroid and small and had not spread to the lymph nodes. The patients in group 3, showed no evidence of medullary thyroid cancer.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests that patients with a calcitonin level of greater than 60 will have spread to the lymph nodes at the time of surgery. If calcitonin levels are less than 10, the cancer will typically be small at the time of surgery. According to these authors surgery may be delayed in patients with normal calcitonin and pentagastrin stimulated calcitonin levels. This may be particularly beneficial for young patients who may be at higher risk for complications at the time of surgery. This assumes that young patients will be carefully followed and aggressively treated if calcitonin levels increase.

— Ronald B. Kuppersmith, MD, FACS

ABBREVIATIONS & DEFINITIONS

Thyroidectomy: surgery to remove the entire thyroid gland. When the entire thyroid is removed it is termed a total thyroidectomy. When less is removed, such as in removal of a lobe, it is termed a partial thyroidectomy.

Medullary thyroid cancer: a relatively rare type of thyroid cancer that often runs in families. Medullary cancer arises from the C-cells in the thyroid.

Pentagastrin stimulation test: a sensitive test to stimulate calcitonin levels to diagnose latent medullary

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THYROID CANCER, continued

thyroid cancer. This test is currently unavailable in the United States.

Calcitonin: a hormone that is secreted by cells in the thyroid (C-cells) that has a minor effect on blood calcium levels. Calcitonin levels are increased in patients with medullary thyroid cancer.

RET gene: this is a gene that is normally expressed in cells. Thyroid cancer cells frequently have mutations in the RET gene. It is unclear whether mutations in this gene cause the cancer or are just associated with the cancer cells