



THYROID CANCER

Presence of BRAF gene mutations in small thyroid cancers is an indication of worse prognosis

WHAT IS THE STUDY ABOUT?

Papillary cancer is the most common thyroid cancer. Small papillary thyroid cancers are cancers that are less than 2 cm in size. While most patients with these small cancers have an excellent prognosis and are treated solely with surgery, a few patients do not do well, with recurrent cancer that requires more aggressive therapy. Many investigators are studying how to identify patients that have the more aggressive small papillary thyroid cancers. The focus of these studies is on mutations in cancer-associated genes, especially a gene known as BRAF. The aim of this study was to correlate BRAF gene mutations with the clinical and pathological features in patients with small papillary thyroid cancers.

THE FULL ARTICLE TITLE:

Basolo F et al. Correlation between the BRAF V600E mutation and tumor invasiveness in papillary thyroid carcinomas smaller than 20 millimeters: analysis of 1060 cases. *J Clin Endocrinol Metab* 2010 doi:10.1210/jc.2010/jc.2010-0337.

WHAT WAS THE AIM OF THE STUDY?

The aim of this study was to correlate BRAF gene mutations with the clinical and pathological features in patients with small papillary thyroid cancers.

WHO WAS STUDIED?

The study group included 1060 patients who had surgery for papillary thyroid cancers less than 2 cm at the University of Pisa, Italy, between January 2006 and April 2009. All patients had a total or near total thyroidectomy and removal of enlarged lymph nodes when necessary.

HOW WAS THE STUDY DONE?

Thyroid cancer specimens from each patient were obtained and examined for the presence of a mutation in the BRAF gene. The thyroid cancers were also divided into groups based on degree of spread of the cancer into surrounding tissues.

WHAT WERE THE RESULTS OF THE STUDY?

A mutation in the BRAF gene was common and was found in 44.6% of all cancers. The mutation was more common in larger cancers (> 1.1 cm), those without capsule surrounding the cancer, those spreading into surrounding tissues and lymph nodes and in patients with a more advanced stage of disease. Only 1/3 of the non-aggressive papillary cancers had the BRAF mutation while 2/3 of the aggressive papillary cancers had the mutation. The results suggest that BRAF mutation may be a precursor to the cancer invading the soft tissues adjacent to the thyroid.

HOW DOES THIS COMPARE WITH OTHER STUDIES?

The prevalence of BRAF mutation in this study was similar to prior reports. While most prior reports linked presence of BRAF mutation in papillary cancers to worse outcomes and older age at diagnosis, some did not find an association with age, or cancer aggressiveness. In this study, presence of BRAF mutation was linked with younger age at diagnosis and worse outcomes.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The identification of mutations in cancer-associated genes has the potential to identify the small numbers of patients with papillary thyroid cancer that have a worse prognosis. The results of this study suggest that cancers that contain mutations in the BRAF gene require more aggressive therapy.

— Mona Sabra, MD

ATA THYROID BROCHURE LINKS

Thyroid cancer: http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html

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THYROID CANCER, continued

ABBREVIATIONS & DEFINITIONS

Cancer-associated genes — these are genes that are normally expressed in cells. Cancer cells frequently have mutations in these genes. It is unclear whether mutations in these genes cause the cancer or are just associated with the cancer cells. The cancer-associated genes important in thyroid cancer are BRAF, RET/PTC and RAS.

BRAF gene — this is gene that codes for a protein that is involved in a signaling pathway and is important for cell growth. Mutations in the BRAF gene in adults appear to cause cancer.

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.

Papillary thyroid cancer — the most common type of thyroid cancer.



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