

**THYROID CANCER****BRAF^{V600E} Mutation in papillary thyroid microcarcinoma as recurrence risk factor****BACKGROUND**

The rate of diagnosis of papillary thyroid cancer has increased markedly in the past 20 years. Up to half of these new diagnoses are small (<1 cm) and are termed microcarcinomas. Despite this increase in thyroid cancer, there has not been a corresponding increase in deaths from thyroid cancer, which is ~0.5% over 10 years. While most patients with papillary thyroid cancer do very well, rarely this cancer can be aggressive. Because of this, it is likely that some cancers are overtreated. Predictors of aggressive cancers are being sought to help decrease this risk for overtreatment. One such predictor may be the presence of a mutation in a common cancer gene (BRAF^{V600E} mutation). This mutation has been shown to be common in larger papillary thyroid cancers that are more aggressive. This study was done to determine if the BRAF^{V600E} mutation can predict recurrence in papillary thyroid microcancer, and therefore help to guide treatment decisions.

THE FULL ARTICLE TITLE

Chen Y et al BRAF^{V600E} is correlated with recurrence of papillary thyroid microcarcinoma: a systematic review, multi-institutional primary data analysis, and meta-analysis. *Thyroid* 2016;26:248-55. Epub January 11, 2016

SUMMARY OF THE STUDY

A large search was done for studies that reviewed the correlations between BRAF^{V600E} and recurrence of papillary

thyroid microcancer. A total of 431 articles were initially screened, but only 4 met criteria for inclusion. These inclusion criteria were papillary thyroid cancer less than 10mm in size, BRAF^{V600E} studies, documentation of clinical remission, and at least 2 years of follow-up. Also, 2 unpublished series were added to the analysis. The sample size of the combined series was 2247 patients (average age of 45-50, 77-88% women) from 6 different datasets of patients. BRAF^{V600E} rate was 40-69% of the patients depending upon the series, with recurrence rates of 10.0% in the BRAF+ group and 4.5% in the BRAF negative group. BRAF^{V600E} mutation status was directly correlated with this ~2-fold increase in the rate of recurrence.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study suggests that the presence of the BRAF^{V600E} mutation is correlated with recurrence of papillary microcancers. If this indeed is true, initial treatment could then be tailored to reduce recurrence in higher risk patients, sparing low risk patients from potential side effects of therapy. Prospective trials from the time of nodule evaluation through long-term follow-up will be helpful in confirming whether the BRAF^{V600E} mutation analysis can predict cancer recurrence.

— Julie Hallanger Johnson, MD

ATA THYROID BROCHURE LINKS

Thyroid Cancer: <http://www.thyroid.org/thyroid-cancer/>

ABBREVIATIONS & DEFINITIONS

Papillary microcancer: a papillary thyroid cancer smaller than 1 cm in diameter.

Cancer recurrence: this occurs when the cancer comes back after an initial treatment that was successful in destroying all detectable cancer at some point.

Genes: a molecular unit of heredity of a living organism. Living beings depend on genes, as they code for all proteins and RNA chains that have functions in a cell.

Genes hold the information to build and maintain an organism's cells and pass genetic traits to offspring.

Mutation: A permanent change in one of the genes.

BRAF gene: this is a 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.