



THYROID CANCER

Being overweight is linked to a genetic mutation that causes increased risk of thyroid cancer

BACKGROUND

The medical community has recognized that excess weight (obesity) is a risk factor for different types of cancers, including breast, colon and pancreatic cancers. Some studies have suggested that obesity is also associated with thyroid cancer. Part of this association is that the increase in thyroid cancer has mirrored the increase in obesity in the United States. Since there has been a rise in the cases of thyroid cancer at the same time that there are more people who are obese, it is important to find the cause of this relationship. Some studies suggest that obese patients seek more medical care and are more likely to be diagnosed with thyroid cancer. Others point to chemicals in the environment that increase both obesity and thyroid cancer. Still others have looked at cancer gene mutations as a cause.

One such cancer gene mutation that is known to promote thyroid cancer is called *BRAF^{V600E}*. This review was done to determine if *BRAF^{V600E}*-positive thyroid cancer was associated with obesity.

THE FULL ARTICLE TITLE

Rahman S et al 2020 Obesity is associated with *BRAF^{V600E}*-mutated thyroid cancer. *Thyroid*. Epub 2020 Mar 31. PMID: 32228152.

SUMMARY OF THE STUDY

This study looked at the Body Mass Index (BMI) and the presence of BRAF mutation in participants ages 18 to 79 between the years 2013 and 2016. The study included

1013 thyroid cancer patients and 1057 individuals without thyroid cancer. The average age of participants was 52 years, 73% were women, and 88% had papillary thyroid carcinoma, of which approximately 59% were *BRAF^{V600E}*-positive. Age and sex distributions were similar between patients with and those without the *BRAF^{V600E}* mutation.

Overweight and obesity were significantly associated with an increased risk of thyroid cancer (as high as double the risk compared to normal weight subjects). This was noticed in thyroid cancers with and without the *BRAF^{V600E}* mutation. In regards to having more *BRAF^{V600E}*-positive thyroid cancers - this was only seen in obese/overweight women (not in men). There was no association between the participants' weight and how aggressive the cancer was.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

In this study, overweight/obesity was associated with general increased risk of thyroid cancer with the *BRAF^{V600E}* mutation in women. This is important because it suggests a genetic link to both obesity and thyroid cancer. At this point, it is unclear if treatment of the obesity or the thyroid cancer would have any effect on the other disorder. Importantly, most obese patients do not have thyroid cancer. However, it is important that doctors and patients are aware of this risk.

— Maria Brito, MD

ATA THYROID BROCHURE LINKS

Thyroid Cancer (Papillary and Follicular): <https://www.thyroid.org/thyroid-cancer/>

Thyroid and Weight: <https://www.thyroid.org/thyroid-and-weight/>





THYROID CANCER, continued

ABBREVIATIONS & DEFINITIONS

Body-mass index (BMI): a standardized measure of obesity calculated by dividing the weight in kilograms by the square of the height. A normal BMI is 18.5-24.9, overweight is 25-30 and obese is >30.

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.

Papillary thyroid cancer: the most common type of thyroid cancer. There are 4 variants of papillary thyroid cancer: classic, follicular, tall-cell and noninvasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP).

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