Why Have Thyroid Cancer Diagnoses Spiked for U.S. Women?

Women are four times more likely to be diagnosed with thyroid cancer than men—but most cases are indolent. Is it overtreatment?

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Thyroid cancer is diagnosed more often in women than men. And over the past few decades, this sex-based gap has grown—substantially.

A new study, however, indicates that this disparity isn't what it seems on the surface. A large contributor appears to be that women are more likely to be diagnosed with small thyroid cancers that would have been unlikely to cause problems during their lifetime, researchers reported August 30 in JAMA Internal Medicine.

Women were more than four times as likely as men to be diagnosed with a small papillary thyroid cancer during their lives, the study found. Such cancers are rarely fatal. In contrast, diagnoses of aggressive and often deadly types of thyroid cancer were nearly equal in men and women. There was also no real difference between sexes in small papillary thyroid cancers found on autopsy, which weren't detected during life.

The study wasn't designed to pinpoint the cause of this imbalance. But women are more likely than men to undergo tests for other medical reasons that can detect these small cancers that otherwise would have probably not been found. "And as clinicians, we're primed to think about thyroid problems more often in women," said Louise Davies, M.D., M.S., of the Department of Veterans Affairs, who led the new research.

Currently, it's not possible to know, on detection, whether any one small thyroid cancer will go on to grow and become a problem, Dr. Davies added. But the large differences by sex in the number of these cancers found during life versus after death indicate that many thyroid cancers found in women would very likely never have caused any problems.

"We're finding [many] cancers that might never progress," Dr. Davies said. This means that, for many women, treating a thyroid cancer found in the absence of symptoms can have more harms than benefits.

Because thyroid cancer is often diagnosed in younger women, side effects from treatment can potentially affect their lives for decades, explained Megan Haymart, M.D., an endocrinologist and

thyroid cancer specialist at the University of Michigan, who was not involved in the study.

“It’s the most common cancer detected in adolescents and young adults aged 16 to 33,” she said. “There’s definitely a risk for harms to these women.”

The Potential Downside of Finding More Thyroid Cancers

Like other cancers, thyroid cancer isn’t one disease. There are several different types of thyroid cancer (based in part on the type of cell in the thyroid that the cancer began in), and each type can have very different prognoses. For example, few people with anaplastic thyroid cancer, a very rare but aggressive type, will live for even a year. But almost everyone diagnosed with a small papillary thyroid cancer will be alive 5 years after diagnosis.

In fact, past autopsy studies have shown that many people die with—not from—a small papillary thyroid cancer.

“You can die with [such] a cancer never knowing you had it,” Dr. Davies said. If these cancers are found by chance, any intervention can potentially be overtreatment—that is, therapy for a cancer that would have stayed the same or sometimes even gotten smaller, and never caused any symptoms.

And overtreatment not only carries the risk of side effects without any benefit to the patient, but it can also include substantial financial costs.

The most common side effect from surgery to remove part or all of the thyroid gland (thyroidectomy) is a lifelong need for thyroid hormone replacement therapy, which can have its own side effects. “Most people feel fine, but some might not feel as well as they did before surgery,” Dr. Haymart said.

Surgery to remove thyroid cancer also has the potential to damage vocal cord functions or nearby glands that control calcium levels in the body, she explained.

Since the 1990s, a boom in the use of thyroid ultrasound and needle biopsies, which had been developed in the previous decades, has led to thyroid cancer diagnoses more than tripling. However, during the same period, the proportion of people who have died from the disease remained about the same.

To get a fuller picture of the differences in thyroid cancer diagnoses by sex, Dr. Davies and her colleagues looked at the incidence of and deaths from all types of thyroid cancer recorded in NCI’s Surveillance, Epidemiology, and End Results Program (SEER) database between 1975 and 2017.

They also searched for all previously published studies that reported the prevalence of undiagnosed thyroid cancers found on autopsy for both women and men. Such studies provide an estimate of the proportion of people who die with—not from—thyroid cancer.

Trends in Thyroid Cancer Diagnosis by Sex and Cancer Type

As seen in previous studies, the researchers found that diagnoses of thyroid cancer increased sharply beginning in the 1990s. At the peak of this trend, in 2013, about 22 cases of thyroid cancer were diagnosed per 100,000 women, compared with only about 8 per 100,000 men. Papillary thyroid cancer accounted for around 75%–80% of cases diagnosed between 1975 and 1989. This increased to 90% between 2010 and 2017.

Correspondingly, between 1983 and 2017, women were more than four times as likely as men to receive a diagnosis of a small, localized papillary thyroid tumor. When larger and more advanced papillary thyroid cancers were included, women were only about 2.5 times as likely as men to receive such a diagnosis.

For more deadly types of thyroid cancer, such as medullary thyroid cancer and anaplastic thyroid cancer, the gap between sexes nearly disappeared, with diagnoses being about equally likely for men and women. And from 1992 to 2017, the overall annual death rate from any thyroid cancer diagnosed during life was approximately the same for women and men.

The researchers also identified eight studies—including more than 23,000 people in total—that reported the prevalence of undiagnosed thyroid cancer on autopsy. Unlike diagnoses made in the living, the prevalence of undiagnosed small papillary thyroid cancer did not differ substantially between women and men.

Rao Divi, Ph.D., of NCI's Division of Cancer Control and Population Sciences, called the imbalance between sexes reported in the study "striking." The findings, Dr. Divi continued, do raise important concerns about overdiagnosis.

In addition to highlighting the potential for overdiagnosis and overtreatment, Dr. Davies said, these results point to two sides of another problem.

On one hand, doctors are less likely to think of thyroid cancer as a potential cause of symptoms reported by a man, which can lead to delayed diagnosis for them. On the other, "we do women a disservice if we say: Women only get the low-risk cancers. That's not true either," she said.

What Happens after a Thyroid Cancer Diagnosis?

The disparity by sex in the prevalence of small papillary thyroid cancers found during life and after death suggests that many women are receiving treatment for small tumors that might never have caused symptoms, Dr. Davies explained.

The factors that lead more women to get a diagnosis of small papillary thyroid cancer are numerous and complex, she said. Women tend to be more likely than men to seek medical care overall. They're more likely to encounter health issues that may have hormonal causes, such as difficulties with pregnancy.

Thyroid ultrasound is widely used to evaluate medical problems that may involve the thyroid. But it's not intended to be used to screen people who don't have symptoms for thyroid cancer, Dr. Davies explained. However, she added, it often gets ordered along with other tests to speed the process of diagnosing a potential thyroid issue.

"That can lead to finding things that were unrelated to someone's symptoms. And that can also distract from discovering the real cause of the problem someone came to the clinic for," said Dr. Davies.

The biggest challenge, said Dr. Haymart, is that it's currently impossible to predict which tumors found by chance will pose a threat to health.

"How do you determine which cancers might be indolent and just sit there for the rest of the patient's life, and which ones might be aggressive and potentially cause harm?" she asked. "That's very difficult to tease out."

No matter how a small asymptomatic thyroid cancer is found, it can't be dismissed outright, Dr. Haymart explained. But unlike with many other cancer types, people diagnosed with a small papillary thyroid tumor have time to understand their treatment options and get a second opinion, she added.

"With thyroid cancer, typically, making decisions about treatment isn't urgent," said Dr. Haymart. "It's perfectly fine for people to take time to process the information, think about their preferences, talk with family members and loved ones, and come up with a decision that's right for them, she said.

"There's time to actually think through these things," agreed Dr. Davies. "It's not an emergency."

Some people may be able choose a surveillance approach, having a small thyroid nodule imaged regularly and not taking action unless it starts to grow, explained Dr. Haymart. Others may want to have a needle biopsy and make decisions based on those results.

And molecular tests are becoming available that can help determine whether a small thyroid mass is more or less likely to contain cancer. Such tests can help determine whether surgery is needed.

"Molecular testing has led to improvements, but I think there's more room for tailored care," said Dr. Haymart. "We need additional data on how to incorporate patient characteristics, tumor characteristics, and molecular results [into treatment decision making]."

More research is also needed to better understand whether thyroid cancer is really a different disease in women and men, she added.

"Although overdiagnosis likely plays an important role, thyroid nodules and thyroid diseases are more common in women in general. So some wonder if there may also be biological differences as well."

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