False positives and false promises for Alzheimer's disease

Using ten blood proteins and the status of an Alzheimer's linked gene, a team of industry scientists in London reported in the journal Alzheimer's and Dementia they were able to predict which patients with mild cognitive impairment would go on to develop Alzheimer's disease within a year.

The study and press release said the test was 87 percent accurate, which would make it a boon for clinicians everywhere. Instead of waiting for a person to develop the disease outright, they could predict who will get it. This would give patients time to reach out to their families and plan, while they are still cognitively intact, how they want to be cared for later in life.

The finding was widely reported last week. Alzheimer's disease affects more than five million people in the U.S. There are no treatments or a cure and the cognitive decline patients experience can be especially brutal for family members and other caretakers. A study that could predict which patients who have some impairment will go on to develop the disease would be very valuable.

But a few journalists dug a bit deeper into the study, pulling apart the 87 percent figure. They discovered, with a look at the relevant statistics that the test would be far from useful to clinicians. John Gever, a veteran medical reporter at MedPage Today, called the study 'another round of exaggeration.'

I urge you to read his full analysis of the test, but in summary, using the reported sensitivity and specificity, Gever summarizes:

> That's 26 false positive results against nine correctly positive. That's useless in a clinical setting. In fact, it's worse than useless, since the false-negative results will expose patients to unnecessary clinic visits and treatments, and generate anxiety for them and their families.

So for every patient the test correctly identified, more than two would be incorrectly told they would develop Alzheimer's within the next year. What's more is there's nothing to be done for patients regardless of how the test. In this situation, Gever argues, is testing even worth while?

> In the real world of geriatric medicine, even 100 percent accuracy is of limited use to patients and clinicians. They can be watched more closely for onset of disabling symptoms and perhaps treated more aggressively with symptomatic medications such as cholinesterase inhibitors. But without a disease-modifying therapy, it won't transform the experience for patients.

This test draws a lot of parallels with genetic testing for Alzheimer's. If a person decides to be tested for the APOE gene, which has the strongest association with developing the disease, his or her results will only offer a risk profile. The results can never definitely say whether the disease will develop because there are so many other factors that play a role, most of which we are just beginning to understand.

It's only natural to want an answer, especially when your loved one is falling ill. But as genomics moves further and further into the practice of medicine on a personal level, we will all need to become more adept at understanding and evaluating risk.

Additional Resources:

- [Common Alzheimer's gene APOE4 raises risk for women but not men](#), Genetic Literacy Project
- Confusion reigns on genes, race and Alzheimer's, Biopolitical Times