Q&A: How a simple blood test could affect how Alzheimer's is diagnosed

August 31 2024, by Will Kwong

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A simple blood test to diagnose Alzheimer's disease, which afflicts nearly 7 million Americans, could soon replace more invasive and expensive diagnostic methods such as spinal taps and brain scans.

The discovery would make Alzheimer's diagnosis faster, more accessible and cheaper. Additionally, the blood test has the potential to enable more people to begin taking Alzheimer's medications at the disease's earliest stages.

Soeren Mattke, a professor of economics and director of the Brain Health Observatory at the Center for Economic and Social Research in the USC Dornsife College of Letters, Arts and Sciences who studies how advances in technology affect the access to memory care, spoke on the subject.

What are the current methods to diagnose Alzheimer's disease?

In order to determine if someone has Alzheimer's disease, you need to show the pathology exists in the brain—typically the presence of amyloid clumps in the brain. Historically, this determination has been done using two methods.

One method is a PET scan. This is similar to an MRI, but the contrast agent is a radioactive tracer that binds to amyloid in the brain. If you do a scan, you can see whether or not that tracer is present in the brain, and that confirms the presence of amyloid.

The second way is a cerebral spinal fluid analysis for which you have to do a lumbar puncture, draw fluid and then analyze the spinal fluid in the lab to determine evidence of amyloid proteins.

What are the weaknesses of these approaches?

Neither method is great. PET scanners can be inaccessible due to the expense of the device. There are only 2,500 PET scanners, give or take,

in this country. And these scanners are only in the larger cities, the larger hospitals, because you need a high volume of patients to pay for a PET scanner.

CSF analysis is more scalable, but patients are reluctant to this method of testing. In CSF analysis, a needle must be inserted into a patient's spine. Many doctors have stopped practicing CSF analysis due to patients' hesitation.

How will blood tests change the diagnostic process?

A few years ago, researchers began to develop blood tests that could replace the need for collecting cerebral spinal fluid. Blood tests for Alzheimer's have been around for quite a while, but the APS2 test developed by researchers at Lund University is the most accurate to date.

There are blood tests aside from APS2 on the market, but they're not quite as accurate. They can only be utilized as so-called "triage tests." A doctor could say, "Well, if the test is negative, we can be pretty sure that the patient isn't an Alzheimer's candidate." These blood tests would decrease the number of PET scans and CSF tests, but they wouldn't completely eliminate them.

How will a high-performing blood test affect health care policies with regard to Alzheimer's?

That's the focus of my research. My lab creates projections of how a novel diagnostic product might impact the diagnosis process and, by extension, access to care. We don't endorse products, but our studies test the performance of potential diagnostic tools. One of our research studies forecasted the effect of a diagnostic tool with similar characteristics to APS2.

The overall message is: with a highly accurate blood test, you can shorten diagnostic wait times quite dramatically. That's really important because the longer a doctor has to wait for a patient's definite diagnosis, the more time is lost before patients can get started on treatment.

Alzheimer's is a progressive, neurodegenerative disorder. The longer you have to wait for diagnosis and treatment, the more cognitive capacity is lost. And that loss is irreversible. I'm trying to figure out how to get the health care system to act as fast as possible.

You published a study last year that found more than 7 million Americans have mild cognitive impairment but most have not been diagnosed. Do you think this blood test could solve that problem?

Yes and no. A clinical diagnosis of mild cognitive impairment is a necessary first step, but we cannot formally diagnose Alzheimer's disease based on the clinical presentation. Confirmation of the pathology is still required.

My hope is that an easier path to confirmation of pathology with a blood test and the availability of disease-specific treatment will motivate physicians to pay more attention to early-stage cognitive decline.

Provided by University of Southern California

Citation: Q&A: How a simple blood test could affect how Alzheimer's is diagnosed (2024, August 31) retrieved 3 September 2024 from https://medicalxpress.com/news/2024-08-qa-simple-blood-affect-alzheimer.html