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Beyond the Brain Scan: Blood-Based Biomarker Tests for Alzheimer's Detection

Ashley Baker:
Welcome to *NeuroFrontiers* on ReachMD. I'm psychiatric nurse practitioner Ashley Baker, and today I'm with Dr. Suzanne Schindler to discuss her research that compared leading blood tests for Alzheimer's disease pathology. Dr. Schindler is the lead author for this study and an Associate Professor of Neurology at Washington University School of Medicine in St. Louis. Dr. Schindler, thanks for being here today.

Dr. Schindler:
Thanks so much for inviting me.

Ashley Baker:
To start us off, Dr. Schindler, how are tests for Alzheimer's disease used in the clinic?

Dr. Schindler:
So when a patient develops memory and thinking problems and comes to see me in my memory clinic, the cause of their symptoms is often not clear; and sometimes for a variety of different reasons, we're worried that Alzheimer's disease brain pathology may be a cause or a contributor to their cognitive impairment. In the past 20 or 30 years ago, we didn't know, and the only way we found out for sure whether someone had Alzheimer's disease as the cause of their symptoms was by doing an autopsy after they passed away. But we have, fortunately, developed tests that now can tell us in living patients whether they have this Alzheimer's disease pathology in their brain, and this helps us to give them a more accurate diagnosis and to tell them what to expect with their prognosis.

Ashley Baker:
Why are Alzheimer's blood tests so important?

Dr. Schindler:
So we've had these specialized brain scans called amyloid PET scans and also spinal fluid tests available that can really with high accuracy diagnose whether someone has this Alzheimer's disease brain pathology. And we've had these tests for over 10 years, but they're quite burdensome and expensive to perform; patients don't necessarily like getting a spinal tap, and these PET scans until very recently weren't paid for by insurance, and they are many thousands of dollars, so we just didn't do testing in very many patients. We'd only do it in pretty rare circumstances—probably less than 5 or 10 percent of our patients—where we really thought that the diagnosis would help us in our management. So we're still using those tests in some patients, but now we have these blood tests that in some cases have been demonstrated to be as accurate as the FDA-approved CSF test. And, of course, we do blood tests all the time in medicine, and patients are used to them; the burden is quite low, and so we now have the capability to find out pretty quickly and accurately whether someone has this Alzheimer's disease brain pathology, and so I think that that's very helpful. So really why these blood tests are important is that it will allow us to make an earlier and more accurate diagnosis of Alzheimer's disease in many more patients than we ever could have done with the spinal fluid test or the specialized imaging scans.

Ashley Baker:
And what motivated you and your team to compare leading blood biomarker tests for Alzheimer's disease pathology?

Dr. Schindler:
So blood tests for Alzheimer's disease have developed extremely quickly over the last five years, and there are now at least five tests that I can order as a clinician on my patients, but these tests in a variety of different studies have shown very different performance. So

some of these tests are as accurate as these FDA-approved CSF tests, but other tests are not much better than a flip of a coin. The problem is that these tests have been studied in different populations, and so you're really comparing apples to oranges, and so to really understand how these tests are performing relative to one another, you have to run them on the same exact samples in what we call a head-to-head study, so that's what we did. And we selected four tests that are now clinically available, and we also selected two tests that are widely used in the research community, and we compared how these tests performed in terms of predicting whether someone had these amyloid brain changes on PET or not. And so the key outcome in our study was the accuracy in classifying amyloid PET status and statistical analyses demonstrating whether certain tests were similar or superior or inferior to one another in classifying amyloid PET status. We also looked at a variety of other measures that are relevant to Alzheimer's disease, including something called tau PET, which measures neurofibrillary tangles in the brain volumes, and also cognition, whether someone actually had symptoms from Alzheimer's disease or not. And we evaluated how all of these different blood test measures performed in the classification and correlations with these various Alzheimer's disease outcomes.

Ashley Baker:
For those just tuning in, you're listening to *NeuroFrontiers* on ReachMD. I'm psychiatric nurse practitioner Ashley Baker, and I'm speaking with Dr. Suzanne Schindler about her research comparing leading blood tests that can detect Alzheimer's disease.

So, Dr. Schindler, let's move into the results of your study. What were the key findings?

Dr. Schindler:
Well, we looked at 15 different blood test measures from six different companies, and we found a very clear result, and that was that one specific analyte that we looked at called pTau217 performed the best in predicting all these different Alzheimer's disease-related outcomes. And we looked at other measures as well, including analytes like Aβ42/40 and pTau181 GFAP and NfL, so these are all analytes that have been studied quite a bit in Alzheimer's disease research. But for all of the outcomes we looked at—amyloid PET status, tau PET status, whether someone had significant brain shrinkage and also whether they had symptoms—pTau 217 did the best.

Ashley Baker:
And how do you think your findings about blood-based biomarkers, like plasma pTau217, might influence the development of new treatments for Alzheimer's disease?

Dr. Schindler:
Well, we are working very hard to find new and better treatments for Alzheimer's disease. One issue has been that it's in some cases a bit difficult to identify individuals who have Alzheimer's disease brain pathology without doing testing. We have been using CSF tests and amyloid PET scans to do this for clinical trials, but that's very expensive and really slows down recruitment for the study, so we think that by using blood tests instead to identify individuals who have this pathology, it will significantly speed up these trials, and that means that we'll get to more effective treatments faster, which, of course, is what we want.

Ashley Baker:
Before we close, Dr. Schindler, are there any final thoughts you'd like to leave with our audience today?

Dr. Schindler:
So in the past, there's been this idea that progressive cognitive decline and dementia were relatively normal as you got older. We have through our research learned that is not correct, that when someone has progressive cognitive decline and dementia, it's because they have a brain disease in many cases. However, because we haven't had readily accessible diagnostic tools, most people have gone undiagnosed; a lot of older people in years past had dementia likely caused by Alzheimer's disease, but they never received a clear diagnosis. So now with these new diagnostic tools, we will be able to diagnose Alzheimer's disease earlier and more accurately, but also, this gives us a lot of hope that we'll be able to identify individuals who may benefit from treatments. And the treatment pipeline is full right now, and I'm very hopeful that in the future we will have more treatments. We have two FDA-approved treatments right now that we're using on our patients that weren't available even a couple years ago. Hopefully, we'll have many more treatments. So these blood tests really give us hope that we'll be able to identify people quickly who may benefit from these treatments so this is really just a transformational time in the field, and I have a lot of hope for my patients.

Ashley Baker:
With those final thoughts in mind, I want to thank my guest, Dr. Suzanne Schindler, for joining me to discuss her study comparing leading blood tests for Alzheimer's disease to determine which biomarkers most accurately predict amyloid and tau pathology. Dr. Schindler, it was great having you on the program.

Dr. Schindler:
Thanks so much.

Ashley Baker:
For ReachMD, I'm psychiatric nurse practitioner Ashley Baker. To access this and other episodes in our series, visit *NeuroFrontiers* on ReachMD.com, where you can Be Part of the Knowledge. Thanks for listening.