

Alzheimer's, in the United Kingdom thousands will be able to take a blood test to diagnose dementia

Two studies will involve five thousand patients to test the validity of blood biomarkers on a large scale. Here's how they work and what blood tests measure

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Thousands of people across the UK worried about their memory condition will be able to have a blood test to identify Alzheimer's disease or other dementias years in advance. The goal is to speed up diagnosis and test a cheaper and simpler way to detect the disease with greater certainty. The two trials will be launched by the University of Oxford and University College London, involving 5,000 volunteers, recruited in 50 different memory centres, who will be followed for five years. Blood tests to date have proven to be very effective, but now the United Kingdom wants to understand whether these simple, low-cost blood tests (around 115 euros) can also be useful in the real world and therefore used on a large scale by the service national health system for the diagnosis of Alzheimer's.

What will be studied

The two studies will cost approximately twelve million euros and will take place across Great Britain. Volunteers will be recruited from people who have reported symptoms such as memory problems or otherwise compatible with dementia to their GP. In the first work, conducted by University College London and led by neurology professor Jonathan Schott, 1,100 people will be involved: half of the

patients will receive the results after three months and the other half after a year to understand if the early diagnosis can actually effectively improve the effects of therapies. The team of scientists will focus in particular on the most promising biomarker for Alzheimer's disease, called p-tau217, which can indicate the accumulation of beta amyloid in the brain. The study will see whether measuring p-tau217 in the blood can increase the rate of diagnosis of Alzheimer's disease in people with early dementia, but also in those with mild but progressive memory problems. The second work, conducted by Oxford researchers, will investigate the blood tests of almost 4,000 people to understand which will be the most effective in distinguishing different types of dementia such as Alzheimer's, dementia with Lewy bodies and vascular dementia. Vanessa Raymont, from the University of Oxford, explained that numerous blood tests on dementia have shown promising results, but have limitations: «Research tends to exclude the elderly, ethnic minorities and those suffering from other pathologies, so we want to understand what happens in the real world." «If, as we hope, new treatments capable of slowing down Alzheimer's disease will soon be available - adds Jonathan Schott - early diagnosis becomes fundamental because drugs seem to bring benefits only if taken in the early stages of the disease».

The diagnosis

In the United Kingdom, as well as in Europe and Italy, the diagnosis of Alzheimer's is now based mainly on cognitive tests. While these symptom-based tests are effective at determining when a person's memory and thinking are not normal, they are not as effective at

helping doctors uncover the cause of these disorders, which can actually result from anything from vitamin and hormone deficiencies to small strokes, from tumors to infections, from Parkinson's-related disorders to dementia with Lewy bodies, as well as of course Alzheimer's disease. Cognitive tests are not always considered sufficient for a correct diagnosis, even if the diagnostic criteria are applied as best as possible, as a large study published in *Jama* in 2019 also demonstrated. Over a third of people suffering from dementia are unable to have a clear diagnosis with Alzheimer's, and only 2% of patients receive a definitive evaluation through brain scans (expensive test) or cerebrospinal fluid sampling (invasive test). For this reason, research is focusing heavily on non-invasive and low-cost blood biomarkers to identify Alzheimer's proteins well in advance. To date, none of these blood tests have yet been approved by a regulatory body and the two large UK studies will certainly help identify the best ones.

What plasma biomarkers measure for Alzheimer's

Blood tests measure abnormal levels of amyloid beta proteins in the blood, a characteristic signal of Alzheimer's disease, but also the presence of phosphorylated tau protein and non-specific neuronal damage (see light chain neurofilaments), even before the onset of symptoms. «A positive value - comments Alessandro Padovani, director of the Neurology Clinic at the University of Brescia and president of the Italian Society of Neurology - indicates the need to carry out further tests, but if negative it excludes the disease». Beta amyloid in the brain builds up slowly over decades, typically starting in middle age, and becomes more common as we age. Plasma

biomarkers should also be read from a preventative perspective. «We have known for some time - adds Padovani - that keeping some of the 12 risk factors identified in 2020 by a commission of the Lancet magazine under control can perhaps avoid, but certainly postpone the appointment with a neurodegenerative disease. High blood pressure, for example, is an under-diagnosed co-factor in 60% of the population. With the right prevention, 4 out of 10 Alzheimer's diagnoses could be avoided. Knowing that you are positive for a biomarker can only be an incentive to work with commitment and consistency on prevention, taking seriously the strategies to improve brain health with 'objective of changing the natural history of the disease.'»

Drugs against Alzheimer's

An early and accurate diagnosis of Alzheimer's disease will also ensure that people have access to drugs against the disease, currently available in the United States, in the future. Two drugs, lecanemab and donanemab, are currently being examined by the EMA (European Medicines Agency) which will have to give its opinion shortly on safety and efficacy. Even with non-negligible side effects, these monoclonal antibodies have demonstrated a certain effectiveness only if taken in the early stages of the disease, which is why the certain and early diagnosis of Alzheimer's disease will become fundamental to allow patients to access future therapies.