Recommendations for biomarker-based diagnosis of neurocognitive disorders

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Experts from 11 European scientific associations and organizations and a patient advocacy association (Alzheimer Europe) have collaborated to define a diagnostic pathway focused on each individual case that enables

the right tests to be identified according to the symptoms profile.

The pathway is easy to use in memory clinics and enables a highly reliable diagnosis to be made. The study is published in *The Lancet Neurology*.

This diagnostic pathway has been developed on the basis of the scientific literature and from the practical experience of the specialists. After having examined the individual's complaints, performed memory tests and conducted a brain MRI, the specialist can now take advantage of these recommendations to classify the case into one of the 11 defined phenotypes, then look for biomarkers using the tests recommended by the international experts, namely lumbar puncture, amyloid PET, glucose PET, ioflupane SPECT, MIBG SPECT and tau PET.

Moving beyond the biomarker-centric approach

The objective of the diagnostic pathway is to overcome the current limitations of the recommendations and guidance related to the diagnosis of Alzheimer's disease. The latter focus mainly on the disease itself or on biomarkers, rather than on the person affected.

Although they have been developed to help clinicians use the correct diagnostic tests, they reveal gaps when applied in clinical practice. Indeed, most of these recommendations do not take account of the many diagnostic options available nor of the existence of several tests that can be carried out simultaneously or sequentially.

Moreover, those that do take these into account often only reflect the opinion of non-representative expert groups. As a result, in clinical practice biomarker choice is often influenced more by organizational and logistical considerations than by clinical factors.

"The diagnostic pathway we have developed will help clinicians define the most informative biomarker in the most frequent clinical case scenarios. It will promote consistency in the diagnosis of neurocognitive disorders in European countries, reduce the cost of analyses and identify those eligible for treatments with more precision," explains Prof. Giovanni Frisoni, head of the HUG Memory Center, Professor of Clinical Neuroscience at the University of Geneva and first author of the study.

To reach this consensus the 22 experts used the Delphi participatory approach to compare the difference in effectiveness of one test compared to another in various situations. This approach consists of measuring the specialists' opinion on the characteristics studied in order to retain only those opinions that achieve a consensus of over 70% and therefore considered highly probable.

Next steps

This pooling of expertise has enabled a reference standard to be established that will be useful to all doctors in Europe. It will now be incumbent on national services, health care providers, medical officials and insurance companies to implement it in each country.

As far as the study is concerned, the next step will be to integrate blood biomarkers into the decision tree. These are only available currently within the remit of research and are in the process of being approved for clinical use. In future they will avoid up to 70% of invasive tests such as lumbar punctures and PETs, helping to reduce costs and expand diagnoses in the general population.

In the United States the first anti-amyloid drug was approved by the Food and Drug Administration (FDA) in 2021 followed by a second in 2023. These drug types will be introduced in Europe in 2024. The arrival

on the market of the first drugs for specific forms of Alzheimer's disease will now require the existence of a consensual, precise and easy-to-apply diagnostic pathway. Indeed, these expensive disease-modifying treatments can only be prescribed at the cost of increasingly accurate diagnoses.

Explosion in cases of Alzheimer's disease in Switzerland

In Switzerland the number of people affected by Alzheimer's disease or another form of dementia is expected to reach 315,400 by 2050, up from 153,000 in 2023 according to Alzheimer Switzerland. It is the most common form of dementia in older people, although it can also affect younger individuals.

Characteristics of Alzheimer's disease include the formation of beta-amyloid protein plaques and neurofibrillary degeneration in the brain, resulting in the progressive death of brain cells. Over time the disease progresses from mild forgetfulness to impaired cognitive functions, memory and the ability to perform everyday tasks. These symptoms are easily confused with those of other neurocognitive disorders.

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