BioSpectrum
the business of Bio & Health Sciences
ASIA EDITION

How blood-based protein biomarkers enable early detection and intervention of Alzheimer’s disease

01 September 2023 | Opinion | By Dr Joyce Ouyang, Managing Director, Cognitact Limited, Hong Kong

Blood-based protein biomarkers have emerged as a promising tool for the early detection of Alzheimer's disease

Alzheimer's disease (AD) is a rapidly growing global public health concern, with an estimated 55 million patients worldwide. This number is projected to double every twenty years, reaching a staggering 139 million in 2050, primarily due to the ageing population. AD progresses in stages, with early symptoms including memory loss, language difficulties, and spatial awareness problems. As the disease advances, individuals may experience personality changes, confusion, and difficulty with daily activities.

While treatment options for AD have remained stagnant for the past two decades, there is now a glimmer of hope. Lecanemab, a mono-antibody targeting amyloid-beta (A?), the pathological hallmark of AD, recently received traditional approval from the US FDA this July. The significant milestone marks the first disease-modifying drug with significant beneficial effects. However, individuals recommended to take the drug often have mild symptoms that go unnoticed in daily life and miss the window for effective treatment. Therefore, there is an urgent need for a diagnostic test to screen the population for early-stage AD.

Blood-based protein biomarkers have emerged as a promising tool for the early detection of AD. Research studies have shown that specific blood proteins, such as plasma A?42/40 ratio, phosphorylated-tau (p-Tau) isoforms, and neurofilament light chain (NfL), are significantly associated with AD. Compared to traditional diagnostic methods like cognitive tests and brain imaging, measuring these blood-based protein biomarkers is less invasive, more convenient, and much cheaper in

clinical settings. However, a single biomarker is usually inadequate in capturing the full range of AD-associated changes within the body. Consequently, it lacks the necessary accuracy to detect AD in early stages and indicate the progression of the disease.

PlasmarkAD, a blood test that simultaneously measures 21 blood protein biomarkers, was introduced to clinics in Hong Kong in July. Developed by a research team at the Hong Kong University of Science and Technology and licensed to Cognitact Limited for further development and commercialisation, it leverages cutting-edge proteomic technology and self-developed machine learning algorithms. This innovative test detects AD 5-10 years before symptoms manifest with an accuracy of 96 per cent through a simple blood draw. Moreover, it provides a multi-dimensional analysis of various body systems that may be affected by AD, including the immune, metabolic, nervous and vascular systems, enabling personalised analysis and recommendations.

In real clinical settings, this multiplex biomarker panel offers a simple blood test for large-scale population screening of early AD cases, with only 1/3 of the price of brain scanning. Additionally, the examination of multiple biomarkers assists in disease staging and patient stratification. Longitudinal test results, combined with medical consultation records, provide valuable insights into disease progression and treatment response over time. This information enables timely intervention and biomarker-guided targeted therapy.

For over a century, people have been fighting against AD and the decline of memory. Now, with the advent of AD drugs and blood-based protein biomarker examinations, we are finally witnessing the dawn of a triumphant era. Although there is still a long journey ahead, we believe these powerful tools will bring us one step closer to defeating this devastating disease.

Dr Joyce Ouyang, Managing Director, Cognitact Limited, Hong Kong