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Japan introduces world's first machine learning model to screen Alzheimer's disease

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First machine learning study to focus on biological data and lifestyle data



Japan-based Oita University and pharmaceutical firm Eisai Co. have announced the development of the world's first machine learning model to predict amyloid beta (A?) accumulation in the brain using a wristband sensor. This model is expected to enable screening for brain A? accumulation, which is an important pathological factor of Alzheimer's disease (AD), simply by collecting biological and lifestyle data from daily life.

In AD, which is said to account for over 60% of the causes of dementia, A? begins to accumulate in the brain about 20 years before the onset of the disease. This has prompted the development of new therapeutic drugs targeting A?, leading to the approval of an humanized anti-soluble aggregated A? monoclonal antibody in Japan.

The key to maximising treatment effects of the medicine is detecting A? accumulation in the brain of patients with mild cognitive impairment before the onset of symptoms. Currently, although brain A? accumulation can be detected by positron emission tomography (amyloid PET) and cerebrospinal fluid testing (CSF testing), the number of medical institutes able to perform those tests is limited, and the high cost and invasiveness of these tests are considered issues. Therefore, development of an inexpensive and easy-to-use screening method has been sought after to identify those who need amyloid PET or CSF testing.

Although lifestyle factors, including lack of exercise, social isolation, and sleep disorders, as well as diseases, including hypertension, diabetes, and cardiovascular disease are known risk factors for AD, thus far, studies applying machine learning models to predict brain A? accumulation have used only cognitive function tests, blood tests, and brain imaging tests. In contrast, this is the first machine learning study to focus on "biological data" and "lifestyle data".