Assessment of High Risk for Alzheimer’s Disease Using Plasma Biomarkers in Subjects with Normal Cognition in Taiwan: A Preliminary Study

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Abstract

Background: In Alzheimer’s disease (AD), cognitive impairment begins 10-15 years later than neurodegeneration in the brain. Plasma biomarkers are promising candidates for assessing neurodegeneration in people with normal cognition. It has been reported that subjects with the concentration product of plasma amyloid β 1-42 and total Tau protein, i.e. \( \beta_1 \times \tau \), higher than 455 pg²/ml² are assessed as having a high risk of amnesic mild impairment (aMCI) or AD, denoted as high risk of AD (HRAD). The prevalence of high-risk for dementia in cognitively normal controls is explored by assaying plasma biomarkers.

Method: In this work, 422 subjects aged 20 to 89 years were enrolled in seven cities around Taiwan. All enrolled subjects were clinically diagnosed with normal cognition. Plasma \( \beta_1 \), \( \beta_2 \), and T-Tau levels were assayed for each subject using immunomagnetic reduction to assess the risk of dementia.

Result: The results in this study showed that 4.6% of young adults (age: 20-44 years), 8.5% of middle-aged adults (age: 45-64 years) and 7.3% of elderly adults (age: 65-90 years) had HRAD. The percentage of individuals with HRAD dramatically increased in middle-aged and elderly adults compared to young adults.

Conclusion: The percentage of HRAD in cognitively normal subjects are approximately 10%, which reveals that the potentially public-health problem of AD in normal population. Although the subject having abnormal levels of \( \beta \) or Tau is not definitely going on to develop cognitive declines or AD, the risk of suffering cognitive impairment in future is relatively high. Suitable managements are suggested for these high-risk cognitively normal population. Worth noting, the attention should be paid to preventing cognitive impairment due to AD, not only in elderly adults but also middle-aged adults. More subjects should be enrolled in the future to validate the percentage of people with normal cognition with HRAD.