**INTRODUCTION**

Recent research has suggested that late-life dementia may be determined more by the operation of multiple health deficits in the aggregate.[1] This hypothesis has stimulated debate about approaches to brain aging risk identification and reduction.[2] The present study investigates the relationship between physical health and brain health and their combined effect on dementia risks. The deficit accumulation based Frailty Index (FI)[3] was used to estimate the status of physical health; the MRI-based Brain Atrophy and Lesion Index (BALI)[4] was used to assess the status of brain health.

**METHODS**

Subjects from the Alzheimer Disease Neuroimaging Initiative (ADNI Phase II;[5] n=950; age=72.7 ± 7.4 years; women=47.9%) were used for the analysis. Data on clinical assessments, genetic risk factors, cerebrospinal fluid biomarkers, and 3.0 T MRI were collected within a month following the enrolment.

The statuses of brain health and physical health were highly correlated. They increased with age, differed by diagnosis, and were associated with the cognitive assessment scores and the levels of the AD biomarkers and genetic risk factors. An increase of the brain health or the physical health score was associated with a significant greater risk of AD and cognitive decline. The study suggests that the aging brain that is prone to dementia is sensitive to the general health status of both the body and the brain. These data support the role of health enhancement strategies in the promotion of healthy brain aging and the prevention of dementia.


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**RESULTS**

The statuses of brain health and physical health were highly correlated. They increased with age, differed by diagnosis, and were associated with the cognitive assessment scores and the levels of the AD biomarkers and genetic risk factors. An increase of the brain health or the physical health score was associated with a significant greater risk of AD and cognitive decline. The study suggests that the aging brain that is prone to dementia is sensitive to the general health status of both the body and the brain. These data support the role of health enhancement strategies in the promotion of healthy brain aging and the prevention of dementia.

**DISCUSSIONS**

The statuses of brain health and physical health were highly correlated. They increased with age, differed by diagnosis, and were associated with the cognitive assessment scores and the levels of the AD biomarkers and genetic risk factors. An increase of the brain health or the physical health score was associated with a significant greater risk of AD and cognitive decline. The study suggests that the aging brain that is prone to dementia is sensitive to the general health status of both the body and the brain. These data support the role of health enhancement strategies in the promotion of healthy brain aging and the prevention of dementia.