Alzheimer-associated neuronal thread protein as a novel urine biomark in Alzheimer’s disease.

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Alzheimer’s disease (AD) is one of the most common and devastating aging related neurodegenerative diseases. The disease poses a great threat to older individuals and their families, becoming a serious social problem with increasing longevity. The clinical manifestation of disease occurs usually after the age of 65 [1]. This illness is characterized by massive neuronal loss, cognitive dysfunction and loss of memory. The incidence and prevalence continuously increases with advancing age [2].

AD is the most common cause of dementia in the elderly. AD is characterized by pathological findings in the brain: Senile plaques (SPs) and neurofibrillary tangles (NFTs). The former are extracellular aggregates composed of amyloid β (Aβ) peptides [3], while the latter are intracellular aggregates composed of hyperphosphorylated Tau protein. Early diagnosis and intervention to postpone AD development has become the major treatment for AD. Therefore, the development of biomarkers becomes navigation for early diagnosis and intervention in AD.

It is firstly discovered the neurofilament protein (neural thread protein [NTP]) and neurofibrillary tangles in the brains of a large number of patients with AD in 1992. NTP may play a role in the process of pathological changes in AD. In 1996, De la Monte and Wands successfully cloned a 41 KDa protein associated with the AD NTP, named as AD7c-NTP [4-6]. While, it remains unclear whether the level of AD7c-NTP in urine is increased in patients with AD. Our study aimed to examine the level of AD7c-NTP in urine to determine if it could assist in the diagnosis of cognitive impairment by comparing differences among normal controls, Mild cognitive impairment (MCI) patients and AD patients [7]. The participants were as following: 60 MCI patients and 45 AD patients were selected from the Clinic of Neurology, and 65 normal participants were selected from the Department of Health Medicine, Xuanwu Hospital between October 2011 and April 2014.

Our study showed that the level of urinary AD7c-NTP in the MCI group was higher than in the normal controls, indicating that the urinary level of AD7c-NTP had already increased in the early stage of cognitive impairment. In addition, the urinary levels of AD7c-NTP in the AD group were higher than those in MCI group study [7]. Based on our findings, we concluded that combined neuropsychological testing and urinary AD7c-NTP may be an effective way to screen MCI patients for AD in a clinical setting.

Our results demonstrated that the level of Alzheimer-associated neuronal thread protein (AD7c-NTP) in urine may be an important biomarker of mild cognitive impairment [7]. It firstly showed that urinary AD7c-NTP levels are higher in MCI patients than in normal individuals, which suggested that urinary AD7c-NTP may be an important and novel biomarker for early diagnosis of MCI.

References

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