In the news

AD BIOMARKERS AT AAIC 2019

Progress in the search for blood-based biomarkers for Alzheimer disease (AD) and other dementias was highlighted in several presentations at the Alzheimer's Association International Conference (AAIC) 2019 (14–18 July 2019, Los Angeles, CA, USA).

Using plasma levels of amyloid precursor protein (APP) and amyloid-β (Aβ) peptides, Akinori Nakamura and colleagues developed a composite biomarker comprising the $APP_{669–711}$:$Aβ_{1–42}$ and $Aβ_{1–40}$:$Aβ_{1–42}$ ratios. This biomarker was tested against imaging findings in 131 patients with mild cognitive impairment, AD or non-AD dementia and 70 cognitively healthy controls. The biomarker values were found to correlate with imaging measures of brain Aβ deposition, atrophy and glucose hypometabolism. "We found that the plasma biomarker can detect earlier stages of amyloid deposition, even before dementia symptoms are apparent," concluded Nakamura.

In another study reported at AAIC 2019, Filippo Baldacci and co-workers measured levels of α-synuclein, Aβ and tau in red blood cells from healthy controls and patients with early-stage AD. The researchers showed that levels of α-synuclein — both alone and in combination with Aβ or tau — were reduced in the cells from patients with AD. "Red blood cells may represent workable and relevant models of neurodegeneration since they are likely to be involved in the accumulation and clearance of the misfolded proteins," commented Baldacci.

In a third study, Adbul Hye and colleagues measured plasma levels of neurofilament light chain (NfL) — a marker of axonal damage — in a range of dementias. The investigators detected significantly elevated levels of plasma NfL in several neurodegenerative conditions, including AD, frontotemporal dementia, dementia with Lewy bodies, corticobasal syndrome, amyotrophic lateral sclerosis and Down syndrome with dementia. "Though, as previously seen in other studies, NfL is not specific for any condition, with validation it could be valuable as a relatively inexpensive and fast test for accumulating neurodegeneration in the brain," concluded Hye.

Heather Wood

RELATED ARTICLE Hampel, H. et al. Blood-based biomarkers for Alzheimer disease: mapping the road to the clinic. *Nat. Rev. Neurol.* **14**, 639–652 (2018)

In the news

AAIC 2019 HIGHLIGHTS SEX DIFFERENCES IN AD

Women and men exhibit notable differences in Alzheimer disease (AD) risk and resilience, according to data presented at the Alzheimer's Association International Conference (AAIC) 2019 (14–18 July 2019, Los Angeles, CA, USA).

In one study, Brian Kunkle and colleagues used exome-wide analysis to explore sex differences in genetic risk factors for AD. The investigators found that the genes *MCOLN3* and *CHMP2B* were specifically linked to AD risk in men, whereas the *CD1E* and *PTPRC* genes were related to AD risk in women only. "This research demonstrates that genetics may contribute to differences in risk and progression of AD between men and women," commented Kunkle.

In the early stages of AD, verbal memory is known to be better preserved in women than in men. In a new study reported at AAIC 2019, Erin Sundermann and colleagues used ^{18}F-FDG–PET to identify neuroimaging correlates of this phenomenon. The researchers found that in the presence of moderate levels of amyloid-β deposition, women showed higher levels of brain glucose metabolism than did men, suggesting that the female brain is more resilient to AD-related brain changes at this stage of the disease.

In a third study presented at the conference, Elizabeth Rose Mayeda and co-workers found evidence that social factors can contribute to cognitive resilience in the female population. Specifically, the team observed that participation in the paid workforce during early adulthood and middle age was associated with a reduced rate of cognitive decline in women.

"The majority of people living with AD are women and it's imperative we understand why," said the Alzheimer's Association chief science officer Maria C. Carrillo. "The research reported … at AAIC gets us one step closer to answering that question by identifying specific biological and social reasons why AD is different in men and women."

Heather Wood

RELATED ARTICLE Ferretti, M. T. et al. Sex differences in Alzheimer disease — the gateway to precision medicine. *Nat. Rev. Neurol.* **14**, 457–469 (2019)

In the news

SENSORY LINKS TO DEMENTIA FROM AAIC 2019

Two studies presented at the Alzheimer's Association International Conference (AAIC) 2019 (14–18 July 2019, Los Angeles, CA, USA) demonstrate a link between co-occurring impairments in multiple sensory domains and the risk of dementia.

Philip Hwang and colleagues studied the relationship between combined visual and hearing impairment and dementia risk in 2,052 individuals aged ≥75 years. The researchers found that visual or hearing impairments alone were associated with modest increases (10–11%) in the risk of developing all-cause dementia or Alzheimer disease (AD). However, in individuals with impairments in both sensory domains, the risks of all-cause dementia and AD were increased by 86% and 112%, respectively.

"These findings suggest that co-occurring hearing and vision problems in late life are strongly associated with increased risk of all-cause dementia and AD dementia," commented Hwang. "Impairment of more than one sense seems to increase risk of dementia synergistically."

In the second study, Willa Brenowitz, Kristine Yaffe and co-workers examined the relationship between multisensory impairment and dementia risk. The study enrolled 1,810 individuals aged 70–79 years who did not have dementia. The researchers combined measurements of impairments in vision, hearing, smell and touch to generate a multisensory function score — the lower the score, the greater the impairment. The risk of developing dementia over the next 10 years was increased sevenfold in participants in the bottom quartile of sensory function compared with those in the top quartile.

"Our findings suggest that testing for changes in multisensory function may help identify those at high risk for dementia," said Brenowitz. "Sensory function in multiple domains can be measured during routine health-care visits using non-invasive or minimally invasive tests. In addition, some forms of hearing and vision loss can be treated or corrected, which provides potential opportunities for intervention."

Heather Wood

RELATED ARTICLE Murphy, C. et al. Olfactory and other sensory impairments in Alzheimer disease. *Nat. Rev. Neurol.* **15**, 11–24 (2019)