doi: 10.1038/s41572-021-00275-0; Article citation ID: (2021) 7:34 For the Primer, visit doi: 10.1038/s41572-021-00269-y

PrimeView
Alzheimer disease

Alzheimer disease (AD) is a neurodegenerative disorder that causes cognitive impairment, and is the most common cause of dementia. AD is characterized by accumulation of β-amyloid (Aβ)-containing extracellular plaques and intracellular tau-containing neurofibrillary tangles.

Epidemiology

The prevalence of dementia is predicted to increase from 50 million individuals worldwide in 2010 to 113 million individuals by 2050. This increase is driven by increased life expectancy over time. Indeed, the main risk factor for both dementia and AD is age; the incidence of dementia exponentially increases in those >65 years of age. Other risk factors for dementia include diabetes mellitus, hypertension, obesity, low HDL cholesterol, hearing loss, traumatic brain injury and alcohol misuse. Genetic risk factors for AD include variants of *APOE* (of which the ε4 allele increases the risk of dementia 3–4-fold), *TREM2*, *SORL1* and *ABCA7*. Dominantly inherited forms of AD are caused by mutations in *APP*, *PSEN1* and *PSEN2*.

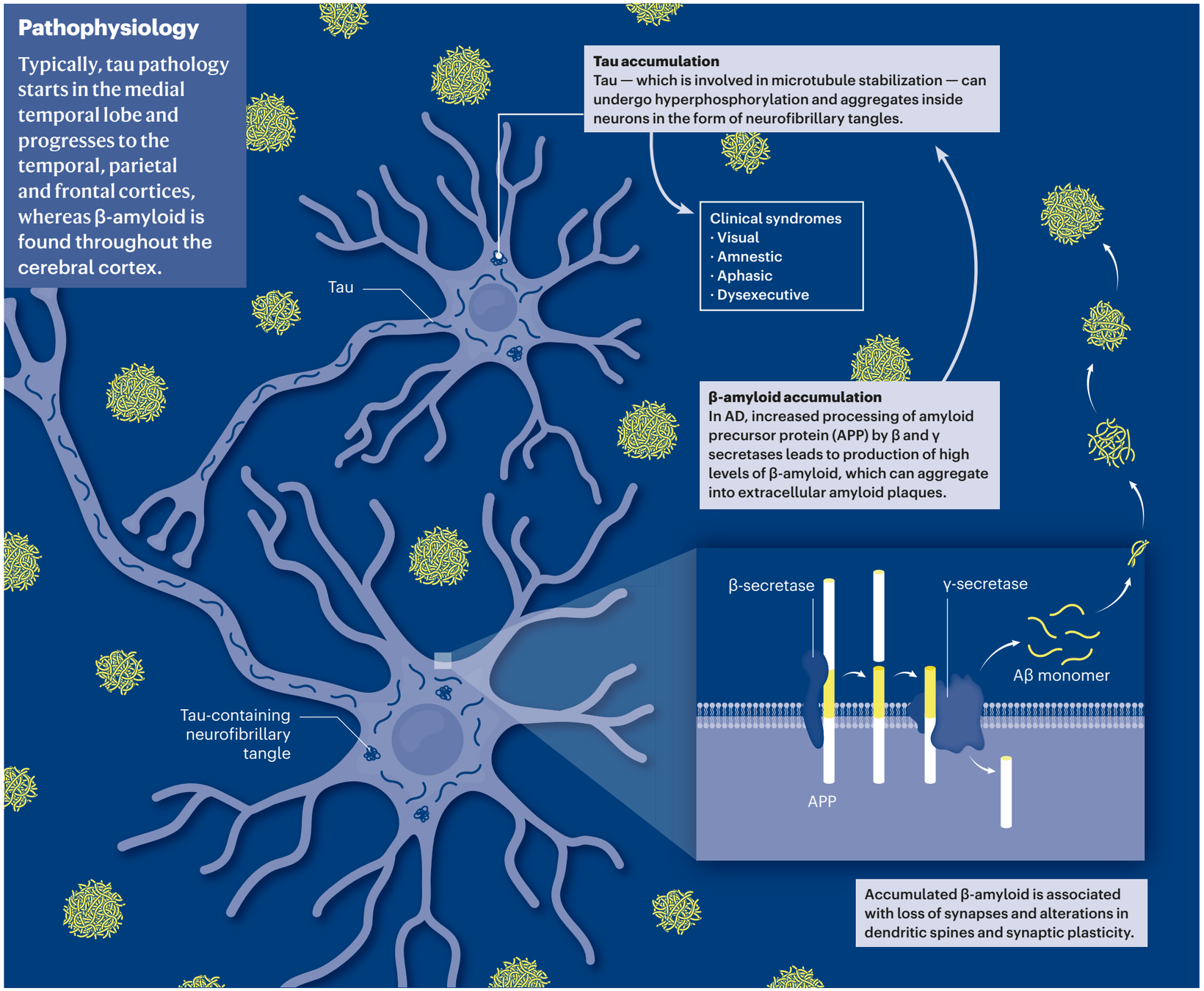
- The characteristic clinical presentation of AD is amnestic cognitive impairment, of which short-term memory deficits are a frequent manifestation. Some patients present with deficits in speech, visuospatial processing and executive function.

Diagnosis

Clinical interview and neuropsychological testing are used to determine the presence and severity of cognitive impairment in individuals with suspected AD. Biomarkers can facilitate diagnosis by identifying AD pathology. Biomarkers of β-amyloid pathology are fibrillar β-amyloid deposit levels measured by amyloid-PET and cerebrospinal fluid levels of Aβ42. Available biomarkers for tau pathology are tau as measured by tau-PET and cerebrospinal fluid levels of p-tau181 and total-tau. Other cerebrospinal fluid biomarkers, such as neurofilament light chain and SNAP-25, are markers for neurodegeneration and are not specific for AD pathology.

Pathophysiology

Typically, tau pathology starts in the medial temporal lobe and progresses to the temporal, parietal and frontal cortices, whereas β-amyloid is found throughout the cerebral cortex.



Management

The only approved pharmacological therapies for AD are the cholinesterase inhibitors donepezil, rivastigmine and galantamine, and the NMDA receptor antagonist memantine. These therapies are approved only for patients with various severities of dementia and can slow symptom progression by ~6 months. As AD occurs in the elderly population, many patients have comorbidities that require treatment in addition to cognitive impairment. Frequent comorbidities that may require treatment in patients with AD include hearing loss, sleep disorders, pain, depression and anxiety.

Quality of life

AD can affect the quality of life of both the patient and their primary caregiver. For both individuals, quality of life can also be affected by the presence of comorbid disorders, the composition of the family unit, finances and the residential setting. Of note, interactions with healthcare professionals can have a considerable effect on the patient's and caregiver's well-being, and all healthcare professionals should try to interact in an open, honest and empathetic manner.

Outlook

Timely diagnosis of cognitive impairment and AD is lacking in many regions. Diagnosis could be improved through the use of technological aids, including smartphone applications and telemedicine approaches, that could provide objective assessment and recording of behavioural changes that are not observed by caregivers.

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