04 - Neuropathological correlate of cognitive decl

Neuropathological correlate of cognitive decline

© SPMM Course Beta A4 peptide interacts with cholinergic receptors and this interaction stimulates the abnormal phosphorylation of tau. The hyperphosphorylated tau is a major constituent of the tangle. It is also present in the degenerated neurites. Hence both tangles and neuritic plaques can be identified by staining with antibody to the abnormal tau. Apart from Alzheimer's, NFT occur in several disorders including Down syndrome, dementia pugilistica (punch-drunk syndrome), Parkinson-dementia complex of Guam, Hallervorden-Spatz disease, and the normal elderly. Most tangles are faintly basophilic. Tau immunostaining and silver impregnation can be used to improve the chances of light microscopic detection. Tangles are mostly intraneuronal, though upon neuronal degenration, they may appear extracellularly, thus losing their basophilia. According to Love (2005), "the earliest pattern of involvement is usually not associated with clinical symptoms: tangles and neuropil threads are restricted to parts of the entorhinal cortex and the CA1 field of the hippocampus. As dementia develops, tangles and neuropil threads accumulate in increasing density in other parts of the hippocampus and medial temporal neocortex, and then in other cortical regions and in subcortical grey matter structures such as the hypothalamus and thalamus". A staging scheme devised by Braak and Braak (1995) is often employed to describe the extent of tangle related abnormalities (distribution from entorhinal cortex to isocortex) in AD and correlates well with the severity of dementia. Stages V-VI operationally define AD. C. Hirano bodies These are rod-shaped eosinophilic bodies in the cytoplasm of neurons. Hirano bodies are seen in the extracellular space when the neuron dies. Hirano bodies are intracellular aggregates of actin and actin-associated proteins They are frequently seen in hippocampal pyramidal cells Neuropathological correlate of cognitive decline The number and distribution of tangles increases as cognitive decline increases. When both neuritic plaques and tangles are present, the presence of even a few tangles in a single field in the neocortex suggests a significant cognitive decline. There is also an association between the numbers of neuritic plaques and the degree of cognitive decline. However, this is less apparent than the relationship between CEREBRAL AMYLOID ANGIOPATHY (CAA) CAA is the accumulation of Aß in the walls of blood vessels (particularly arteries and arterioles) in the cerebral cortex and overlying leptomeninges.

This affects about 30% of normal elderly people but over 90% of patients with AD, in whom the angiopathy tends also to be much more severe.

CAA is an important cause of strokes in the elderly. Most of these are haemorrhagic; CAA is confined to superficial cerebral blood vessels, rupture of the amyloid laden blood vessels usually causes relatively superficial, lobar haemorrhages that may extend into the subarachnoid space.

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