Neurovascular dysfunction and oligemia in linking diabetes and cognitive dysfunction

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Multiple epidemiological studies have demonstrated a remarkable overlap among risk factors for cerebral vascular disorder and sporadic, late-onset AD. For example, mid-life diabetes, hypertension, and obesity have all been shown to increase the risk for both AD and vascular dementia. It is now acknowledged that most AD cases have mixed vascular pathology and small-vessel disease. Moreover, reduced brain blood perfusion, silent infarcts, and the presence of one or more infarctions.

Reduced cerebral blood flow (CBF) and hypoxia, from one end, and neurovascular dysfunction associated with accumulation of different vasculotoxic and neurotoxic macromolecules in the brain, from the other, can initiate neuronal dysfunction and neurodegenerative changes independently and/or prior to Aβ deposition. Elevated levels of Aβ in brain may in turn accelerate neurovascular and neuronal dysfunction and promote self-propagation, leading to cerebral β-amyloidosis.

Diminished CBF, neurovascular dysfunction, and impaired vascular clearance of Aβ from brain support an essential role in linking diabetes and AD pathogenesis.

References:
1. de la Torre JC. 2010. Vascular risk factor detection and control