Abstract

Alzheimer's disease represents an important socio-economic problem worldwide. Its complex and not entirely clear pathophysiological mechanisms are subject of intensive research with the aim to identify the affected individuals very soon in the disease process and to find efficacious prevention or treatment. According to recent knowledge, a multifactorial microangiopathy plays a role in the disease development. Probably both traditional vascular risk factors as well as mechanisms linked to neurodegeneration with amyloid accumulation are the factors involved.

This work presents a summary of up to date knowledge about Alzheimer's disease vascular risk factors, signs of vascular impairment on brain imaging and possible interactions of vascular and neurodegenerative pathophysiological pathways. It focuses on the neurosonological signs of brain vascular impairment and presents own outcomes in this research area. Using cross-sectional and longitudinal design, the study demonstrates functional impairment of brain microcirculation in patients with various cerebrovascular burdens and various degrees of cognitive decline and it identifies the most appropriate neurosonological parameter in the prediction of cognitive decline progression. On the same study sample it explores the association of other vascular factors and signs with the development and progression of Alzheimer's disease.

Keywords

Alzheimer's Disease, Dementia, Mild Cognitive Impairment, Subjective Cognitive Decline, Vascular Hypothesis, Vascular Risk Factors, Neurosonology, Cerebrovascular Reserve Capacity, Breath-Holding Index.