CEREBRAL AMYLOID ANGIOPATHY, BLOOD-BRAIN BARRIER DISRUPTION AND AMYLOID ACCUMULATION IN SAMP8 MICE

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Introduction: Cerebrovascular dysfunction and amyloid-β peptide deposition on the walls of cerebral blood vessels might be an early event in the development of Alzheimer Disease (AD). The senescence accelerated mouse-prone 8 (SAMP8) strain of mice is an experimental model of accelerated aging and has also been proposed as a model of AD.

Aims: To study the time-course of amyloid deposition in blood vessels and blood-brain barrier (BBB) disruption in the CA1 subzone of the hippocampus of SAMP8 mice and the association between these two variables. Another objective is to determine the association between the amyloid deposition in blood vessels and the recently described amyloid clusters in the parenchyma.

Methods: Cerebral tissues from SAMP8 and ICR-CD1 mice were obtained at different ages (3 to 12 months-old). Cryostatic sections were then obtained and immunohistochemical procedures using antibodies against different Ab peptides, blood vessels and endogenous IgG were applied.

Results: SAMP8 mice showed greater amyloid deposition in blood vessels than age-matched ICR-CD1 control mice. Moreover, at 12 months of age the number of vessels with disrupted BBB had increased in both strains, especially SAMP8. At this age, all the vessels with amyloid deposition showed BBB disruption, but several capillaries with altered BBB showed no amyloid on their walls. Moreover, amyloid clusters showed no spatial association with vessels with amyloid deposition, nor with vessels in which the BBB has been disrupted.

Conclusions: Vascular amyloid deposition seems to induce BBB alterations but BBB disruption may also be due to other factors.