NEUROPATHOLOGIC FEATURES OF CENTENARIANS.

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AIMS

While in the brains of patients with Alzheimer disease (AD) the neuropathological hallmarks are senile plaques and neurofibrillary tangles, the neuropathology of centenarians is not completely known and further studies are needed. We performed the neuropathological investigation on 7 centenarian brains that were analyzed immunohistochemically for changes related to A-beta and tau.

MATERIALS and METHODS

At autopsy, brain tissue were fixed in formalin and studied neuropathologically with routine stains and immunohistochemically for reactive astrocytes, activated microglia, A-beta deposits (4G8 monoclonal antibody), neurofibrillary changes containing phosphorylated tau (AT8 monoclonal antibody).

RESULTS

Three subjects (age at death 103 years for two of them and 105 years) showed neuropathologically the typical lesions of Alzheimer disease: abundant Abeta deposits in the cerebral cortex and in the striatum, but not in the cerebellum nor in the brainstem (corresponding to Thal stage 3). Strong intraneuronal staining for 4G8 antibody and variable severity of amyloid angiopathy were detected in the cerebral cortex. Neurofibrillary changes under the form of neurofibrillary changes, neuropil threads and abnormal neurites surrounding the amyloid deposits were present (Braak stages 3-4) and in one subject showed a peculiar topographically distribution, with more intense tau pathology in the occipital cortex compared to frontal and temporal areas.

Three subjects (age at death 102, 105 and 106 years) showed the presence of a moderate number of Abeta deposits largely preamyloid deposits, and tau pathology mainly under the form of neurofibrillary tangles and neuropil threads in the mesial temporal structures indicative of primary age-related tauopathy (PART) and presence of clusters of thorn shaped astrocytes with perivascular distribution, indicative of Aging Related Tau AstroGliopathy (ARTAG).

Finally, one subject (age at death 104 years), was very surprising , being completely free of AD pathology in any brain region, Abeta antibody stained only intraneuronal cytoplasm but was spared from plaques and vascular deposition of amyloid. Immunolabelling for phospho-tau was negative.

Discussion

Our results confirm previous findings indicating that in centenarians AD neuropathological alterations may be relatively mild, while other types of tauopathy are frequent.

Conclusion

Advanced stages of AD pathology does not became universal in extreme old age.

Preferred: platform presentation