IMMUNOHISTOLOGICAL CORRELATION BETWEEN SSAO/VAP-1, BETA AMYLOID (Aβ) AND STRESS-RELATED PROTEINS, IN POST-MORTEM BRAIN OF ALZHEIMER AND ALZHEIMER WITH DIABETES PATIENTS

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Introduction: Vascular pathologies as diabetes are risk factors for the development and severity of sporadic Alzheimer's Disease (AD). The amine oxidase Semicarbazide Sensitive Amino Oxidase (SSAO), present in the cerebrovascular system and in blood plasma, is overexpressed in AD cerebrovascular tissue. Its activity is also increased in the plasma from severe AD patients. Similar alterations in SSAO behaviour have been found in plasma of diabetic patients, associated with vascular dysfunction due to the pathogenesis of the products generated by SSAO activity.

Aims: To establish a comparison between the immunolocalization of SSAO, Aβ deposits and markers of vascular stress or inflammation in post-mortem brains of AD patients, diabetic patients (DM) and AD patients with diabetes (ADD).

Methods: Human brain cortex samples (parietal, frontal and temporal lobes) were supplied by the human neurological tissue bank (Hospital Clínic, Barcelona, Spain). Samples were from non-demented controls (ND, n=6), DM (n=3), AD (n=10) and ADD (n=10).

Results: ADD samples show higher SSAO immunostaining compared to DM or AD samples. Vessels with SSAO staining are surrounded by an increased inflammatory environment evidenced by astrocytic and microglial markers presence. An increase of proteins related with oxidative vascular damage, such as superoxide dismutase (SOD) or ciclooxigenase-2 (COX-2), are also upregulated in the SSAO stained vessels showing the highest values in ADD cortical tissues.

Conclusions: The SSAO increase observed in ADD correlates with the rate of vascular damage measured by the presence of SOD, COX-2 and inflammation, which are all enhanced in ADD patients.