Article: EPA-0381
Topic: P05 - Cognitive Neuroscience

PRELIMINARY STUDIES ON CEREBROSPINAL FLUID OF PATIENT WITH ALZHEIMER'S DISEASE USING PEPTIDE MICROARRAY

Z. Ol·h[1], M. P·k·ski[1], M. TÛth E.[2], A. Zvara[3], P. KlivÈnyi[4], E. Ivitz[1], M. S·ntha[2], L. VÈcsei[4], Z. Janka[1], J. K·lm·n[1]

[1]Department of Psychiatry, University of Szeged, Szeged, Hungary ; [2]Biological Research Centre of the Hungarian Academy of Sciences, Institute of Biochemistry, Szeged, Hungary ; [3]Biological Research Centre of the Hungarian Academy of Sciences, Institute of Genetics, Szeged, Hungary ; [4]Department of Neurology, University of Szeged, Szeged, Hungary

The recently published diagnotic criteria of Alzheimer's disease (AD) includes biological markers (determination of b-amyloid 1-42 (Ab), tau and phospho-tau) from cerebrospinal fluid (CSF), but their positive predictive value proved low, therefore a new biomarker indentification is needed. Apoptosis plays crucial role in AD pathomechanism. Ab interacts with mitochondrial proteins causing oxidative stress. That induces the impairment of energy metabolism promoting tau phosphorylation indicating apoptosis.

The purpose of this study was to identify pathognostic and apoptotic proteins in the CSF of AD patients.

Pooled CSF samples of 5x5 AD patients and 5x5 controls were used. ELISAs were performed to determine the concentrations of Ab, tau and phospho-tau. 10 ultrasensitive slides of peptide microarrays with 653 antigens were used. If the ratio of technical repeats of AD and control samples was under 0.65 that meant decreased protein concentration.

Apolipoprotein D (0,62), DNA polymerase gamma (0,51), parkin (0,58) and methylated-DNA-protein-cysteine methyltransferase (0,56) showed decreased concentration in AD in four chip pairs. The concentration of cyclin-dependent kinase 5 (0,45), granzyme B (0,37) and prostate apoptosis response 4 proteins (0,60) reduced in three chip pairs.

These data contribute to the database that will be used to elucidate the new biological markers for AD. Our findings may have implications for both the diagnosis and the understanding of AD pathogenesis, by defining a patient-specific signature to diagnose AD. Using these 7 biomarkers to identify AD prior to the onset of clinical symptoms and associated with neuronal loss enables novel clinical trial design and early mechanism-based therapeutic intervention.

This study was supported by grants from OTKA (83667), and the Hungarian Ministry of Education and Culture (TÁMOP 4.2.2-08/1-2008-0002, 4.2.1./B-09/1/KONV-2010-0005-3, 4.2.4.A/2-11-1-2012-0001).

https://doi.org/10.1016/S0924-9338(14)77804-6 Published online by Cambridge University Press