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New biomarkers of Alzheimer's disease in Cerebrospinal fluid

Causes of Alzheimer´s disease is not known and ideal biomarkers (100% sensitivity, 100% specificity) of this type of dementia have not been revealed yet. Current biomarkers (levels of amyloid beta 1-42, tau and phospho-tau) in cerebrospinal fluid are often estimated in a combination in order to increase their sensitivity and specificity. Recently, we evaluated new diagnostic biomarkers in cerebrospinal fluid (the ratio of Thioflavin-T-based fluorescence to intrinsic amyloid fluorescence (sensitivity 61.1%, specificity 70.8% compared to nondemented controls), levels of mitochondrial 17beta-hydroxysteroid dehydrogenase type 10 – amyloid beta 1-42 (sensitivity 41.1%, specificity 83.3% compared to nondemented controls), levels of mitochondrial 17beta-hydroxysteroid dehydrogenase type 10 – mitochondrial cyclophilin D (sensitivity 92.9%, specificity 91.7% compared to nondemented controls but only 26.2% compared to Frontotemporal lobal degeneration). Significant changes of all our prospective biomarkers were observed already in early stages of disease (the group of mild-cognitive impairment related to Alzheimer´s diseases), however, specificities failed when compared to other types of dementia. Nevertheless, we can recommend the ratio of Thioflavin-T based fluorescence to intrinsic amyloid fluorescence (reflecting oligomers to aggregates rate) in cerebrospinal fluid as the relatively cheap and easily accessible supportive diagnostic biomarker of Alzheimer´s disease. Moreover, the above-mentioned complexes of two mitochondrial proteins (17beta-hydroxysteroid dehydrogease type 10 and cyclophilin D) in cerebrospinal fluid seem to be the highly sensitive biomarker of neurodegeneration. Supported by AZV project of Ministry of Health of the Czech Republic (16-27611A).

Speaker Biography

Neurochemist Zdenka Kristofikova studied at Czech Technical Univerzity in Prague (Ing., Department of Nuclear Chemistry) and at Univerzity of Defence, Faculty of Military Health Sciences in Hradec Kralove (PhD, Department of Toxicology), both in the Czech Republic. At the present time, she works as a researcher and a head of working group in Department of Experimental Neurobiology of National Institute of Mental Health, Czech Republic. She has over 100 publications that have been cited over 600 times, and her publication H-index is 15. She is interested in cerebrospinal fluid or serum/plasma biomarkers and various animal models (genetic as well as pharmacological) of Alzheimer´s disease for a long time.

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