Annals of General Psychiatry

BioMed Central

Poster presentation

Open Access

Plasma homocystein levels in relation to β Amyloid and Tau Protein in cerebrospinal fluid of patients with Mild Cognitive Impairment and Alzheimer's Disease

Panagiotis Alexopoulos*, Florian Guenther, Tanja Richter- Schmidinger, Barbara Gruss, Jens Wiltfang, Stefan Bleich and Johannes Kornhuber

Address: Department of Psychiatry and Psychotherapy, University Hospital of Erlangen, Friedrich- Alexander Universitaet Erlangen- Nuernberg, Erlangen, Germany

* Corresponding author

from International Society on Brain and Behaviour: 3rd International Congress on Brain and Behaviour
Thessaloniki, Greece. 28 November – 2 December 2007

Published: 17 April 2008

Annals of General Psychiatry 2008, **7**(Suppl 1):S185 doi:10.1186/1744-859X-7-S1-S185

This abstract is available from: http://www.annals-general-psychiatry.com/content/7/S1/S185

Background

Increased plasma homocystein (Hcy) is reported to be an independent risk factor for neurodegenerative diseases [1]. Hcy may be involved in the potentiation of neurotoxic and vasculopathic processes [2,3], leading to β Amyloid (Aβ) and Tau protein accumulation in brains of patients with dementia. A positive association between plasma levels of Hcy and Aβ has been observed [4]. The aim of the present study was to investigate whether plasma Hcy in patients with Mild Cognitive Impairment (MCI) and Alzheimer's disease (AD) correlates with Tau protein and Aβ in cerebrospinal fluid (CSF).

Materials and methods

Plasma Hcy, folate, vitamine B12, creatinine and CSF Tau protein, phosphorylated Tau protein (P-Tau), Aβ 1-42, Aβ 1-40 were assessed in patients with MCI (n=32) and AD (n=15). Differences between the groups with regard to demographic variables, intervals between blood and CSF collection and plasma and CSF parameters were performed using the Mann- Witney- test. Correlations between continuous variables were examined, using unadjusted Pearson correlation coefficients.

Results

The MCI patients were significantly younger and performed significantly better on the MMSE. Tau protein and P-Tau levels were significantly higher in the CSF of AD patients compared to MCI patients. The levels of Aβ 1-42 and Aβ 1-40 were significantly lower in the AD group. Hcy correlated inversely with folate and Vitamine B12, positively with age. Plasma Hcy levels did not correlate with CSF Tau protein, P-Tau, Aβ 1-42 or Aβ 1-40.

Conclusions

Plasma Hcy levels increased with age but did not correlate with CSF parameters in MCI and AD patients.

References

1. Seshadri S, Beiser A, Selhub J, Jacques PF, Rosenberg IH, D' Agostino RB, Wilson PW, Wolf PA: **Plasma homocysteine as a risk factor for dementia and Alzheimer's disease.** *N Engl J Med* 2002, **346:**476-83.
2. Ho PI, Collins SC, Dhitavat S, Ortiz D, Ashline D, Rogers E, Shea TB: **Homocysteine potentiates beta-amyloid neurotoxicity: role of oxidative stress.** *J Neurochem* 2001, **78:**249-53.
3. Zhang C, Cai Y, Adachi MT, Oshiro S, Aso T, Kaufman RJ, Kitajima S: **Homocysteine induces programmed cell death in human vascular endothelial cells through activation of the unfolded protein response.** *J Biol Chem* 2001, **276:**35867-74.
4. Irizarry MC, Gurol ME, Raju S, Diaz-Arrastia R, Locascio JJ, Tennis M, Hyman BT, Growdon JH, Greenberg SM, Bottiglieri T: **Association of homocysteine with plasma amyloid beta protein in aging and neurodegenerative disease.** *Neurology* 2005, **65:**1402-8.