

Concordance between the in vivo concentrations of neurospecific proteins (BDNF, NSE) in the brain and blood in patients with epilepsy

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Background

The state of the brain is usually assessed by analyzing brain-specific substances in peripheral biological fluids that are easily available for research

○ blood ○ urine ○ saliva ○ cerebrospinal fluid

On the other hand, blood-brain barrier and a number of other factors may make such association weak or completely absent.

The extent to which the concentration of neurospecific molecules at the periphery corresponds to their content in the brain remains unknown for the most analytes.



Aim



The study was aimed at elucidating a concordance of the content of neurospecific proteins in the hippocampus and blood:

01. Brain-derived neurotrophic factor BDNF (a universal marker of neurogenesis and neuroplasticity)
02. Neuron-specific enolase NSE (a marker of neuronal damage in brain diseases including epilepsy)

Methods

The subjects

Patients with epilepsy who underwent a planned resection of the hippocampus

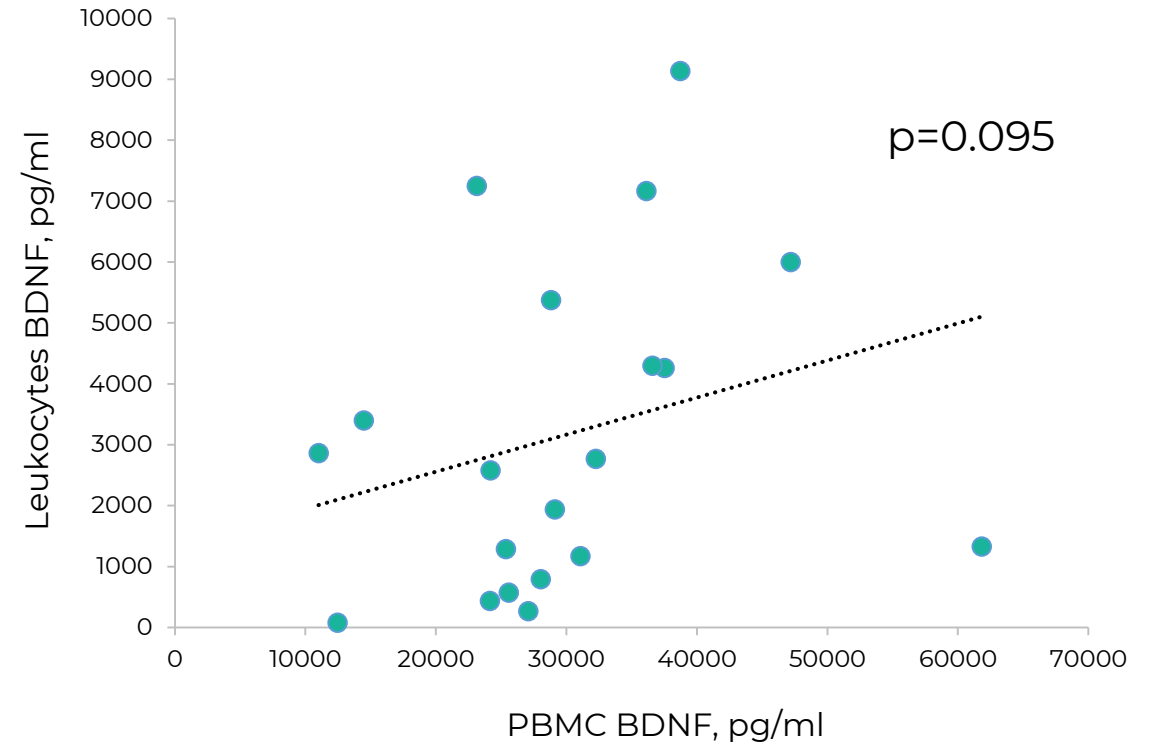
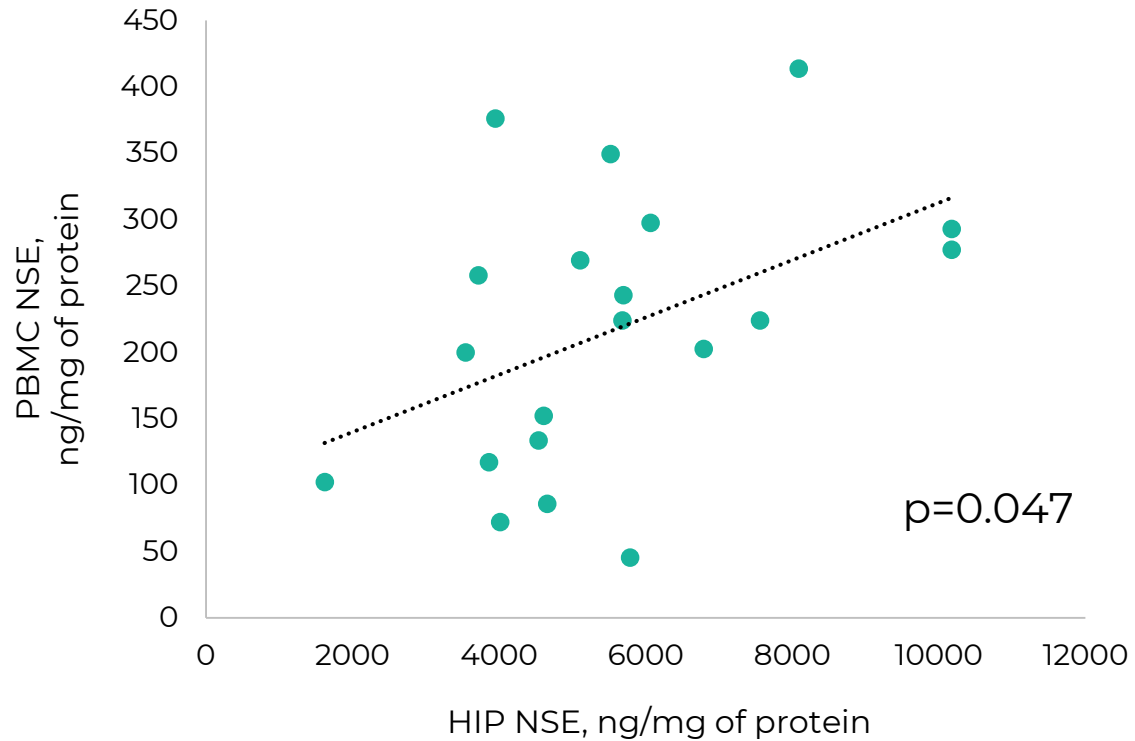
Specimens for the analysis

- 1 hippocampal tissue
- 2 venous blood leukocytes
- 3 serum (taken one hour prior the surgery)



The analysis included a measurement of BDNF by multiplex solid phase analysis, NSE by enzyme-linked immunosorbent assay (ELISA), and total protein by biochemical methods.

Results



NSE concentration corrected by total protein correlated positively between the brain and leukocytes, with the strength of this correlation to be mild ($r=0.45$, $p=0.047$, Pearson test, $N=20$). No other correlations were significant.

Conclusion

This preliminary finding indicates that the concentration of some neurospecific proteins in the periphery reflects their concentration in the brain in humans.

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