

THE RELATIONSHIPS BETWEEN PLASMA BIOMARKERS LEVELS AND PET AMYLOID BURDEN IN ALZHEIMER'S DISEASE

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Background

Background: Plasma biomarkers (e.g., A β 42, A β 40, pTau181, pTau217, GFAP and NfL) have been recommended for Alzheimer's disease (AD) diagnosis and had a good predictive values. However, the association between plasma levels of these biomarkers and brain A β burden have not been determined. In the present study we investigated the associations between plasma biomarkers levels and cerebral A β burden measured by PET.

Methods

Methods: This cross-sectional observational study included 41 patients with AD. All participants underwent A β -PET scans, and global A β burden was measured using Centiloid, while lobar regions A β burden was quantified using SUVmean. Fasting venous blood samples were collected, and plasma levels of A β 42, A β 40, pTau181, pTau217, NfL, and GFAP were measured using chemiluminescence assays. Spearman correlation analysis and multiple linear regression models were used to investigate the associations between plasma biomarkers and cerebral A β burden.

Results

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After adjusting for confounders (age, sex, APOE ϵ 4 genotype, education), multiple linear regression analysis revealed that plasma pTau181 and GFAP levels positively correlated with global A β burden (Centiloid) significantly. Plasma pTau181 and GFAP levels also positively correlated with A β burden in multiple lobar regions (frontal, parietal, temporal, occipital; β range: pTau181 0.022-0.031, GFAP 0.00039-0.00059; all $p < 0.05$). Plasma A β 42 level negatively correlated with A β burden in the insula ($\beta = -0.040$, $p = 0.033$) and subcortical gray matter ($\beta = -0.024$, $p = 0.046$) significantly. Plasma A β 40, A β 42/A β 40 ratio, NfL and pTau217 did not associate with global A β burden (all $p > 0.05$).

Conclusion

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Plasma A β 42, pTau181 and GFAP levels associated with cerebral A β burden, while plasma A β 40, pTau217, NfL levels did not. These indicated that different plasma may connect with different pathophysiology.