Analysis of Amyloid Beta Plasma Biomarkers in Intensive Care Unit Delirium Survivors

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Background & Objective:

Intensive care unit (ICU) delirium occurs in up to 70% of patients with 20-40% later developing dementia post-discharge. Plasma amyloid-beta (Aβ) levels have been associated with Alzheimer's Disease. Whether ICU delirium compared to subsyndromal delirium (SSD) is associated with higher plasma Aβ levels at hospital discharge is not well described.

Methods:

This is a secondary analysis of the IMPROVE randomized controlled trial. Subjects were ICU delirium survivors aged 50 years or older who provided venous blood samples at discharge. Delirium was assessed twice daily until discharge using Confusion Assessment Measurement in the ICU (CAM-ICU). SSD is a less severe form of delirium with one abnormal CAM-ICU feature. Samples were analyzed using a Multiplex Luminex Assay (Thermofisher), values were reported in pg/mL, and compared using the Wilcoxon Rank Sum Test using SAS. The detection range is 451 – 1846900pg/mL for Aβ1-40 vs. 0.68 – 2800pg/mL for Aβ1-42.

Results:

In total, 68 subjects were included, 45% experienced SSD, and 54% had delirium. The mean age in the SSD group was 63.7 years [SD 7.3] vs. 64.4 years [SD 7.1] in the delirium group (p=0.667). The SSD group had a mean education of 13.6 years [SD 2.6] vs. 13.1 years [SD 2.3] (p=0.441) in the delirium group. Median plasma Aβ1-40 levels were 200.55 pg/mL (IQR 137.76, 286.57) in the SSD group, and 189.35 (IQR 150.38, 283.00) in the delirium group. The median plasma values of Aβ1-42 were 0.02 (IQR 0.02, 0.72) for the SSD group and 0.67 (IQR 0.02, 1.85) for the delirium group. There were no significant differences in plasma levels between the two groups (Aβ1-40: p=0.936; Aβ1-42: p=0.178).

Conclusion & Impact:

There were no significant differences in plasma Aβ levels between ICU delirium and SSD. Further studies are needed to explore the relationship between delirium and plasma Aβ levels.