DOI: 10.1002/alz.052733

BIOMARKERS

POSTER PRESENTATION

Alzheimer's & Dementia®
THE JOURNAL OF THE ALZHEIMER'S ASSOCIATION

Stability of blood-based biomarkers of cognitive impairment

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Abstract

Background: Widespread investigation of these biomarkers in large population studies has been hampered as several blood biomarkers of cognitive impairment need the blood to be processed immediately into plasma/serum. We evaluated the stability of these biomarkers to delayed blood processing using an ultra-sensitive assay.

Method: We processed blood collected from 20 volunteers immediately (0 hours), and after a delay of 24 hours and 48 hours to obtain serum. In addition, we also processed blood from five volunteers immediately (0 hours) and after a delay of 24 hours, 48 hours and 72 hours to obtain plasma. All serum and plasma samples were analyzed in duplicate for Aβ42, Aβ40, tau and neurofilament light (NfL) on the Quanterix platform using commercially available assays.

Result: The decrease in plasma Aβ42 and Aβ40 values were relatively modest in blood processed after a delay of 24 hours (6% and 11% respectively), 48 hours (20% and 21% respectively) and 72 hours (30% and 32% respectively) as compared to samples processed immediately. Furthermore, the plasma Aβ42/ Aβ40 ratio showed only a 9% decrease in plasma processed after a delay of 72 hours. Plasma tau levels decreased by 20% at 48 hours as compared to a 9% decrease in serum. Plasma levels of Aβ42, Aβ40 and tau were substantially higher than serum levels. However, even at 48 hours, plasma tau levels were higher as compared to serum levels. NfL levels were comparable in serum and plasma and NfL levels decreased 10% and 6% in plasma and serum at 48 hours.

Conclusion: Despite a decrease in plasma levels of Aβ42 and Aβ40 was substantial after 48 hours the Aβ42/ Aβ40 was stable in plasma processed up to 72 hours after blood collection. Plasma and serum levels of NfL appear to be stable even when blood was processed for up to 48 hours after blood collection while plasma tau levels showed only modest reduction in values over 48 hours. These results suggest that blood-based biomarkers of cognitive impairment can be reliably measured in plasma samples that were processed even after a delay of up to 48 hours after blood collection.