Key Summary of Conference Abstract

Plasma β-Amyloid 1-42/1-40 Ratio Provides Insight into the Presence of Alzheimer's Disease

Background

- Alzheimer's disease (AD) is a chronic neurodegenerative disease characterized by extracellular brain aggregates of β-amyloid peptides.[1]
- These peptides originate from the amyloid precursor protein (APP). Cleavage of APP primarily yields 2 peptides: β-amyloid 1-42 and β-amyloid 1-40.[1]
- Measurement of β-amyloid peptide 1-42 in cerebral spinal fluid (CSF), as well as tau and hyperphosphorylated tau, has become a standard diagnostic tool for AD. A blood-based method would avoid the invasiveness of collecting a CSF specimen.
- In addition, some studies suggest that the ratio of 1-42/1-40 in plasma can help identify patients with AD.[2-4]
- **Objective:** The investigators of this study developed a method to simultaneously measure β-amyloid 1-42 and 1-40 in plasma specimens. They also evaluated the correlation of the 1-42/1-40 ratio with mild cognitive impairment and AD.

Methods

- A highly sensitive multiplex assay for the simultaneous measurement of β-amyloid 1-42 and 1-40 was developed and validated at Quest Diagnostics.
- Clinical specimens were selected from 100 patients who were categorized based on the Clinical Dementia Rating test and the Montreal Cognitive Assessment. The categories were as follows:
  - Normal (n=35)
  - Early mild cognitive impairment (MCI; n=25)
  - Late MCI (n=15)
  - AD (n=25)
- β-amyloid 1-42 and 1-40 were measured using the assay, and 1-42/1-40 ratios were calculated.
- Categories were compared using the Kruskal-Wallis H test.

Results

- β-amyloid 1-42/1-40 ratios were generally higher in specimens from normal patients than those from AD-affected patients (*P*=0.008).
  - Pairing AD with late MCI data and normal with early MCI data slightly improved the distribution (*P* = 0.001).
- For identifying patient with AD vs normal patients, the clinical specificity was 71% and sensitivity was 76%.

Conclusions

- The investigators developed an assay that simultaneously measures β-amyloid peptides 1-42 and 1-40 in plasma specimens.
- The assay allows assessment of the 1-42/1-40 ratio, which may help identify patients with AD.

Poster presentation at the Alzheimer's Association International Conference

Authors

Keith R Morneau,[1] Brian G Sansoucy,[1] Robert J Lagier,[2] Charles M Rowland,[2] Torey Neusch,[1] Altin Qeleshi,[1] Edward I Ginns,[1] Nigel J Clarke[3]

Affiliations

[1] Quest Diagnostics, Marlborough, MA
[2] Quest Diagnostics, Alameda, CA
[3] Quest Diagnostics, San Juan Capistrano, CA

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