Serum Placental Growth Factor as a Marker of Cerebrovascular Disease burden in patients with Alzheimer’s Disease

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INTRODUCTION

- There is a high prevalence of mixed cerebrovascular diseases (CeVD) and Alzheimer’s disease (AD) pathologies in the pathogenesis of dementia. Development of robust blood-based biomarkers provide critical tools to assess studies on diagnosis and treatments of AD with concomitant CeVD.
- Placental growth factor (PIGF) is a member of the endothelial growth factor (VEGF) family and a potent proangiogenic factor involved in regulating endothelial signaling and vascular function. PIGF levels in the CSF were found to be higher in AD and VaD patients, and they were associated with a higher CSF/plasma albumin ratio, WMH, and CMBs in PDD. However, little is known about the alterations of peripheral PIGF levels in CeVD, cognitive impairment and dementia.
- The objective of this study was to examine serum PIGF in preclinical stages of dementia and in AD, as well as to investigate its associations with concomitant CeVD and specific MRI markers of CeVD (i.e., cortical infarcts, WMH, lacunes, and CMBs).

METHODS

- A cross-sectional study was conducted in a total of 241 memory clinic patients who were clinically diagnosed as non-cognitively impaired (NCI), cognitively impaired no dementia (CIND), and Alzheimer’s disease dementia (AD).
- All subjects underwent standard physical, clinical, blood tests, and neuropsychological assessments as well as neuroimaging scans at the National University of Singapore.
- Serum PIGF levels were measured with electrochemiluminescence immunoassays using the Roche Elecsys PIGF assay.
- Neuroimaging measurements of CeVD were determined by MRI. CeVD markers assessed include white matter hyperintensities (WMHs, measured by ARWMC scores), lacunes, cortical infarcts, and cerebral microbleeds (CMBs). Significant CeVD was defined using a previously established cutoffs as the presence of cortical infarct and/or ≥ 2 lacunes and/or confluent WMH (ARWMC score ≥ 8).

RESULTS

- Table 1. Baseline characteristics of the participants based on cognitive categories

- Figure 1. Increased PIGF levels in AD with concomitant CeVD

- Figure 2. Associations between serum PIGF and specific CeVD markers

RESULTS cont.

- Table 3. Multivariate regression analysis on the association between serum PIGF and WMH and CMBs.

- Figure 2. Associations between serum PIGF and specific CeVD markers

- CONCLUSIONS

- Serum PIGF has potential clinical utility as a biomarker for the presence of CeVD such as WMH and CMBs, in AD patients.
- Future longitudinal studies are needed to determine the utility of PIGF as a prognostic biomarker for cerebrovascular causes of cognitive impairment and dementia.

REFERENCES