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Clusterin as a Blood Biomarker for Diagnosis of Mild Cognitive Impairment and Alzheimer's Disease

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ABSTRACT

With increasing global life expectancy, Alzheimer's disease will become an increasingly prevalent health problem. The development of biomarkers that predict risk for both Alzheimer's disease and mild cognitive impairment will be useful for early diagnosis of dementia. To date, no surrogate blood biomarker exists to classify between Alzheimer's disease/mild cognitive impairment and normal controls or Alzheimer's disease and mild cognitive impairment/normal control as a diagnostic parameter. In this study, we analyzed serum levels of amyloid-β 40 ($A\beta_{40}$), amyloid-β 42 ($A\beta_{42}$), clusterin (CLU) and p97 using ELISA kits from 157 subjects with normal cognition, mild cognitive impairment and Alzheimer's disease. We found a significant increase in serum levels of $A\beta_{42}$ ($P<0.05$) and serum clusterin ($P<0.001$) between normal and Alzheimer's disease subjects and between normal and mild cognitively impaired subjects. In contrast, serum $A\beta_{40}$ and p97 levels did not differ significantly between all groups. We also used receiver operating characteristic curves to determine the cut-off point of $A\beta_{42}$ and clusterin to differentiate either cognitively normal from cognitively impaired subjects (both Alzheimer's disease and mild cognitive impairment) or cognitively normal and mild cognitively impaired subjects from those with Alzheimer's disease. Only clusterin with 84% sensitivity, 75% specificity and good accuracy of diagnosis showed promise for diagnosing patients with cognitive impairment (Alzheimer's disease and mild cognitive impairment).

Keywords: Alzheimer's disease, Mild cognitive impairment, Biomarker, Clusterin, Aβ_{42}