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Increased Levels of Coagulation Factor XI in Plasma Are Related to Alzheimer's Disease Diagnosis

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Abstract.
Background: Alzheimer's disease is a complex disorder of unclear etiology that develops in the elderly population. It is a debilitating, progressive neurodegeneration for which disease-modifying therapies do not exist. Previous studies have suggested that, for a subset of patients, dysregulation in hemostasis might be one of the molecular mechanisms that ultimately leads to the development of neurodegeneration resulting in cognitive decline that represents the most prominent symptomatic characteristic of Alzheimer's disease.
Objective: To examine a relationship between factors that are part of coagulation and anticoagulation pathways with cognitive decline that develops during Alzheimer's disease.
Methods: SOMAscan assay was used to measure levels of coagulation/anticoagulation factors V, VII, IX, X, Xa, XI, antithrombin III, protein S, protein C, and activated protein C in plasma samples obtained from three groups of subjects: 1) subjects with stable cognitively healthy function, 2) subjects with stable mild cognitive impairment, and 3) subjects diagnosed with probable Alzheimer's disease.
Results: Our results show that protein levels of coagulation factor XI are significantly increased in patients who are diagnosed with probable Alzheimer's disease compared with cognitively healthy subjects or patients diagnosed with mild cognitive impairment. Furthermore, our results demonstrate that significant predictors of Alzheimer's-type diagnosis are factors IX and XI—an increase in both factors is associated with a reduction in cognitive function.
Conclusion: Our study justifies further investigations of biological pathways involving coagulation/anticoagulation factors in relation to dementia, including dementia resulting from Alzheimer's-type neurodegeneration.

Keywords: Alzheimer's disease, biomarkers, blood coagulation, blood coagulation factor xi, cognitive impairment

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