The main objective of the study was to validate the findings of previous cerebrospinal fluid (CSF) proteomic studies for the differentiation between Alzheimer's disease (AD) dementia and physiological ageing. The most consistently significant proteins in the separation between AD dementia versus normal controls using CSF proteomics were identified in the literature. The classification performance of the four pre-selected proteins was explored in 92 controls, 149 patients with mild cognitive impairment (MCI), and 69 patients with AD dementia. Heart-type fatty acid binding protein (hFABP) and vascular endothelial growth factor (VEGF) CSF concentrations distinguished between healthy controls and patients with AD dementia with a sensitivity and specificity of 57 and 35%, and 76 and 84%, respectively. The optimal classification was achieved by a combination of the two additional CSF biomarker candidates in conjunction with the three established markers Amyloid-\(\beta\) (A\(\beta\))1-42, total-Tau (tTau), and phosphorylated-Tau (pTau)181, which resulted in a sensitivity of 83% and a specificity of 86%. hFABP also predicted the progression from MCI to AD dementia. The present study provides evidence in support of hFABP and VEGF in CSF as AD biomarker candidates to be used in combination with the established markers A\(\beta\)1-42, tTau, and pTau181.