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Titel des Beitrags: Visual Versus Fully Automated Analyses of 18F-FDG and Amyloid PET for Prediction of Dementia Due to Alzheimer Disease in Mild Cognitive Impairment.

Abstract: Biomarkers of Alzheimer disease (AD) can be imaged in vivo and can be used for diagnostic and prognostic purposes in people with cognitive decline and dementia. Indicators of amyloid deposition such as (11)C-Pittsburgh compound B ((11)C-PiB) PET are primarily used to identify or rule out brain diseases that are associated with amyloid pathology but have also been deployed to forecast the clinical course. Indicators of neuronal metabolism including (18)F-FDG PET demonstrate the localization and severity of neuronal dysfunction and are valuable for differential diagnosis and for predicting the progression from mild cognitive impairment (MCI) to dementia. It is a matter of debate whether to analyze these images visually or using automated techniques. Therefore, we compared the usefulness of both imaging methods and both analyzing strategies to predict dementia due to AD. In MCI participants, a baseline examination, including clinical and imaging assessments, and a clinical follow-up examination after a planned interval of 24 mo were performed. Of 28 MCI patients, 9 developed dementia due to AD, 2 developed frontotemporal dementia, and 1 developed moderate dementia of unknown etiology. The positive and
negative predictive values and the accuracy of visual and fully automated analyses of \(^{11}\)C-PiB for the prediction of progression to dementia due to AD were 0.50, 1.00, and 0.68, respectively, for the visual and 0.53, 1.00, and 0.71, respectively, for the automated analyses. Positive predictive value, negative predictive value, and accuracy of fully automated analyses of \(^{18}\)F-FDG PET were 0.37, 0.78, and 0.50, respectively. Results of visual analyses were highly variable between raters but were superior to automated analyses. Both \(^{18}\)F-FDG and \(^{11}\)C-PiB imaging appear to be of limited use for predicting the progression from MCI to dementia due to AD in short-term follow-up, irrespective of the strategy of analysis. On the other hand, amyloid PET is extremely useful to rule out underlying AD. The findings of the present study favor a fully automated method of analysis for \(^{11}\)C-PiB assessments and a visual analysis by experts for \(^{18}\)F-FDG assessments.

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