

The Benson Complex Figure Test detects deficits in visuoconstruction and visual memory in symptomatic familial frontotemporal dementia: a GENFI study

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Previous studies in FTD have shown subtle cognitive deficits in the presymptomatic and early disease stages, suggesting that neuropsychological assessment can provide sensitive markers for disease onset and progression. The Benson Complex Figure Test (BCFT), is an interesting candidate test, as it assesses multiple cognitive functions, including visuospatial abilities, visual memory, and executive functions. The aim of the present study was to investigate differences in the BCFT in presymptomatic and symptomatic FTD, and to explore associations with other cognitive tests and grey matter (GM) volume. We included data from 758 participants (332 presymptomatic and 136 symptomatic mutation carriers, 290 controls) from GENFI. We examined gene-specific differences using Quade's and Pearson X² tests and associations with neuropsychological tests and GM using multiple regression. *GRN* and *C9orf72* mutation carriers had lower Copy scores from FTD-CDR 2. *MAPT* mutation carriers had lower Recall scores from FTD-CDR 1. BCFT Copy and Recall correlated with visuoconstruction ($p<0.05$), memory ($p<0.01$), and executive function ($p<0.05$). There were correlations between BCFT Copy and GM frontal and subcortical atrophy, BCFT Recall correlated mainly with temporal lobe atrophy. Our findings suggest that impaired performance on the BCFT occurs relatively late in the genetic FTD disease process. However, during the symptomatic period, it is a valuable cognitive test as it identifies differential mechanisms of cognitive impairment depending on the genetic mutation involved, corroborated by mutation-specific cognitive and neuroimaging correlates. In addition to its brief and easy-to-apply nature this makes the BCFT a potential candidate for upcoming clinical trials in FTD.

Conflicts of interest

None