

The Dementia Cognitive Fluctuation Scale, a New Psychometric Test for Clinicians to Identify Cognitive Fluctuations in People with Dementia

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Objectives: Cognitive fluctuation (CF) is a common feature of dementia and a core diagnostic symptom for dementia with Lewy bodies (DLB). CF remains difficult to accurately and reliably detect clinically. This study aimed to develop a psychometric test that could be used by clinicians to facilitate the identification of CF and improve the recognition and diagnosis of DLB and Parkinson disease, and to improve differential diagnosis of other dementias. **Methods:** We compiled a 17-item psychometric test for identifying CF and applied this measure in a cross-sectional design. Participants were recruited from the North East of England, and assessments were made in individuals' homes. We recruited people with four subtypes of dementia and a healthy comparison group, and all subjects were administered this pilot scale together with other standard ratings. The psychometric properties of the scale were examined with exploratory factor analysis. We also examined the ability of individual items to identify CF to discriminate between dementia subtypes. The sensitivity and specificity of discriminating items were explored along with validity and reliability analyses. **Results:** Participants comprised 32 comparison subjects, 30 people with Alzheimer disease, 30 with vascular dementia, 29 with DLB, and 32 with dementia associated with Parkinson disease. Four items significantly discriminated between dementia groups and showed good levels of sensitivity (range: 78.6%–80.3%) and specificity (range: 73.9%–79.3%). The scale had very good levels of test–retest (Cronbach's alpha: 0.82) and interrater (0.81) reliabilities. The four items loaded onto three different factors. These items were: 1) marked differences in functioning during the daytime; 2) daytime somnolence; 3) daytime drowsiness; and 4) altered levels of consciousness during the day. **Conclusions:** We identified four items that provide valid, sensitive, and specific questions for reliably identifying CF

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and distinguishing the Lewy body dementias from other major causes of dementia (Alzheimer disease and vascular dementia). (*Am J Geriatr Psychiatry* 2013; ■:■—■)

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Cognitive fluctuations (CF) are spontaneous alterations in cognition, attention, and arousal. They are common features in all types of dementia, occurring in about 20% of people with Alzheimer disease (AD);^{1–3} in 35%–50% of people with vascular dementia (VaD);^{4,5} and are more frequent in people with dementia with Lewy bodies (DLB) and dementia associated with Parkinson disease (PDD), being reported in around 90% of each.^{6–8} As a result, CF are a core diagnostic feature of DLB.⁷ Both DLB and PDD are generally considered to be part of the same spectrum with similar neuropsychiatric phenomena (e.g., CF, hallucinations, rapid eye movement sleep behavior disorder), and the same underlying pathologic features of alpha-synucleinopathy are present in both of these forms of dementia.^{9,10} We therefore use the term *Lewy body dementia* (LBD) when referring to both of these dementias, with PDD and DLB being considered as a single entity. Although different diagnostic criteria are recognized for all major subtypes of dementia, there is ongoing debate about the degree of overlap between LBD, especially DLB, and AD, as well as between AD and VaD. This confusion is in part due to the identification of multiple pathologies in people with dementia at autopsy¹¹ but also because of the difficulty clinically in distinguishing subtypes. People with DLB are often misdiagnosed as having AD,^{12,13} and one of the factors contributing to this misdiagnosis is the inaccurate recognition of CF. The identification and assessment of CF still present a major clinical challenge^{7,14,15} despite several attempts to identify, quantify, and assess the phenomenon.^{6,16–21} Failure to accurately recognize CF contributes to the poor differential diagnosis of DLB because it is one of the three core diagnostic features, of which two need to be present for a confident diagnosis of DLB (probable DLB), and this in turn leads to poorer differential diagnosis in dementia overall. Furthermore, poor recognition of CF represents an important clinical issue because the inaccurate diagnosis of people with DLB leads to inappropriate management, including the prescription of antipsychotic

medications; approximately 40% of patients with DLB who are prescribed antipsychotic medications will exhibit increased sensitivity to these agents, often with serious or even fatal consequences.^{15,16}

The goal of the current study was to develop a short instrument by identifying questions that could be used by all physicians assessing subjects with possible dementia, or known dementia, to facilitate the identification of CF and thus improve the recognition and diagnosis of DLB and PDD, and concomitantly to improve the differential diagnosis of the other dementias. Given the overlap of PDD and DLB, and because CF in particular are the same psychopathologically in PDD and DLB,²¹ the DLB and PDD groups were then merged for the primary analyses and compared with the non-LBD groups (AD and VaD) combined. For other analyses, dementia groups were considered separately.

METHODS

The Dementia Cognitive Fluctuation Scale (DCFS) was designed based on three preexisting measures: the Mayo Composite Fluctuations Scale (MCFS),⁶ the Clinician Assessment of Fluctuation,¹⁷ and the One Day Fluctuation Assessment Scale (ODFAS).¹⁷ The grant applicants for this study who are experienced in LBD research (AJT, UM, and IM) met and discussed the items from these measures together with Dr. Lee to identify which items to include in the pilot version for this study. MCFS items that sensitively distinguished between groups were selected and included in the DCFS (e.g., drowsiness, sleepiness, staring into space). Items from the Clinician Assessment of Fluctuation and ODFAS that were considered to represent CF (e.g., alertness, confusion, daytime somnolence) were also included in the DCFS; items considered unrelated to CF (e.g., falls) were excluded. The final version of the pilot DCFS to be investigated in the current study comprised 17 questions under 4 domains that might identify CF in people with dementia: confusion, sleep, alertness, and communication.^{6,17} [Appendix 1](#) (available online)

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