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Can IQCODE differentiate Alzheimer’s disease and frontotemporal dementia?

SIR—The differential diagnosis of Alzheimer’s disease (AD) and behavioural variant frontotemporal dementia (bvFTD) may be difficult because the clinical features and diagnostic criteria for these conditions show a degree of overlap [1]. A number of bedside test instruments, examining cognitive, behavioural and/or functional domains, and based on patient or informant report, have been suggested to be helpful in making the distinction between AD and bvFTD [2], but those examined in this clinic have not proved particularly useful, namely the Addenbrooke’s Cognitive Examination VLOM ratio [3], the Instrumental Activities of Daily Living Scale [4] and the Cambridge Behavioural Inventory [5].

The Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE) is a widely used screening test for dementia, providing information complementary to cognitive tests [6]. A lower score (range 1–5) represents better performance. As part of ongoing studies of IQCODE in this clinic based in secondary care [7], the utility of IQCODE scores to differentiate AD and bvFTD was examined.

Patients and methods

All cases with diagnoses of either probable AD (using NINCDS-ADRDA criteria [8]) or bvFTD (using Neary criteria [9]) and with IQCODE (long form [10]) performed at the same time as initial clinical and neuropsychological assessments were identified from clinic records over an 18-month period (July 2007–December 2008 inclusive), and IQCODE scores for patients with AD and bvFTD were compared.

Results

As expected, the bvFTD cases (n = 13) had a younger age at diagnosis (range 47–76 years, mean 60.2+/−7.3 years) than the AD cases (n = 41; age range 52–92 years, mean 70.6+/−9.0 years) and a greater male preponderance (bvFTD M:F = 11:2; AD M:F = 15:26).
and bvFTD scores being higher for bvFTD patients in all cases. Mean scores for seven of the 26 questions (Table 1), with patients. Significance of the difference in IQCODE score, since time from symptom onset to diagnosis is reported to be longer in bvFTD than AD [12], but this was not specifically examined in this study.

It is recognised that IQCODE scores may be affected by informant characteristics such as depression and anxiety and by the quality of the relationship between informant and subject [6]. It is possible that the impact on informants of the core diagnostic behaviour symptoms of bvFTD, ‘character change and disordered social conduct’ [9], might account, at least in part, for the observed differences in IQCODE scores found in this study, in addition to the specific questions found to be most likely to differentiate between AD and bvFTD.

### Key points

- The differential diagnosis of AD and bvFTD may be difficult in some cases.
- The IQCODE is a widely used screening test for dementia that provides information complementary to cognitive tests.
- IQCODE scores were higher in bvFTD than AD, and thus may prove useful in the differential diagnosis.
- Specific IQCODE questions found most likely to differentiate AD from bvFTD differ from those previously reported to be useful in screening for AD, and several tap executive rather than mnemonic functions.

### Conflicts of interest

None declared.

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**Table 1. IQCODE questions differentiating between AD and bvFTD**

<table>
<thead>
<tr>
<th>Question</th>
<th>AD vs. bvFTD</th>
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<tbody>
<tr>
<td>Q2 Remembering the names of family and friends</td>
<td>Diff</td>
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<tr>
<td>Q3 Remembering things about family and friends, e.g. occupations, birthdays, addresses</td>
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<tr>
<td>Q12 Knowing how to work familiar machines around the house</td>
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<td>Q18 Understanding magazine or newspaper articles</td>
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<td>Q19 Following a story in a book or on TV</td>
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<td>Q20 Composing a letter to friends or for business purposes</td>
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<tr>
<td>Q22 Making decisions on everyday matters</td>
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Mean IQCODE score for bvFTD patients was 4.34 +/− 0.31 and for AD patients was 3.94 +/− 0.39, a difference which proved statistically significant (t = 3.25, df = 52, P < 0.01).

The null hypothesis that the proportion of patients with IQCODE score ≥ 4.0 did not differ significantly between the bvFTD (11/13 = 84.6%) and AD (17/41 = 41.4%) groups was examined. The result of the χ² test permitted rejection of the null hypothesis (χ² = 6.51, df = 1, P < 0.02), a finding corroborated by the Z test (Z = 2.67, P < 0.01).

Mean scores for each of the 26 questions in the IQCODE long form [10] were compared between AD and bvFTD patients. Significant (P < 0.05) differences were found in the mean scores for seven of the 26 questions (Table 1), with scores being higher for bvFTD patients in all cases.

### Discussion

There is little validation of IQCODE against neuropathological diagnoses [6], and indeed IQCODE was not specifically designed to identify cause of dementia. No prior study examining whether IQCODE is able to differentiate AD and bvFTD has been identified. Nonetheless the preliminary data from this pragmatic study suggest that a high IQCODE score (≥ 4.0) is more likely to occur in bvFTD than AD. Hence the use of IQCODE scores to assist in the differential diagnosis of AD and bvFTD might be worth further examination. Certainly some of the seven IQCODE questions shown to be most likely to differentiate between AD and bvFTD (Table 1) may tap executive functions (e.g. working machines, composing letters, making decisions) rather than simply mnemonic abilities. Only one of these seven questions (remembering things about family and friends) overlapped with those incorporated into a seven-item version of the IQCODE found to have excellent screening properties for MCI and AD [11].

One potential problem with this study was that the average age of the bvFTD group was younger than that of the AD group by some 10 years. Some prior diagnostic studies have compared AD and bvFTD patients with similar age at onset, for example in their fifties [1, 12], but this is of course atypical for the majority of AD patients. Hence the patients in the current cohort are more representative of day-to-day clinical practice, as anticipated in a pragmatic study. It is difficult to assess how the IQCODE might discriminate between bvFTD and AD in patients of similar age. However, since the AD group in this study performed better than the bvFTD group despite their greater age, it is likely that controlling for age may lead to greater differences in IQCODE scores, and therefore not affect the conclusion of the present study. Disease duration might possibly account for part of the difference in IQCODE score, since time from symptom onset to diagnosis is reported to be longer in bvFTD than AD [12], but this was not specifically examined in this study.

References

A comparison of two assessment systems in predicting functional outcomes of older rehabilitation patients

SIR—Inpatient rehabilitation can improve physical functioning and quality of life of older persons with musculoskeletal (MSK) disorders [1–5]. For these persons, small gains in activities of daily living (ADLs) may result in large improvements in functional status and independence [4].

The advantage of rehabilitative services is clear; however, the availability of services is limited [6]. Consequently, it is useful to identify factors that may predict successful rehabilitation and target limited resources to patients most likely to benefit—this information would also help to provide realistic expectations to patients and caregivers, and to guide care and discharge planning [7, 8].

Assessment of rehabilitation potential and the potential success of rehabilitation for older patients is challenging due to medical complexity, frailty and multiple co-morbidities [9, 10]. Valid and reliable assessment systems that capture these characteristics could improve predictions of rehabilitation potential based solely on indicators of functional status. The Functional Independence Measure [FIM; 11] and interRAI/MDS (Minimum Data Set) assessments [12] are instruments designed to measure functional ability, are widely used with older persons and are mandated in multiple care settings. The interRAI/MDS instrument recommended for use in rehabilitation settings is the RAI-Post Acute Care [PAC; 13]. Compared to the FIM, the PAC contains additional information on common characteristics that reflect clinical complexity and, thus, may be predictive of outcome. A direct ‘head-to-head’ comparison of these instruments in the same population would provide important evidence for evaluating the utility of the FIM and MDS in older adults receiving rehabilitation [14].

The objective of this study was to collect data with both the FIM and PAC to assess their relative ability to predict discharge outcomes for older patients receiving inpatient rehabilitation.

Methods

Participants were from musculoskeletal (MSK) and geriatric rehabilitation units (GRU) at London Parkwood Hospital and Toronto Rehabilitation Institute (TRI). Parkwood has a 20-bed MSK and 30-bed GRU that both target frail older persons with multiple co-morbidities. Annually, the TRI GRU admits ~200 patients and the MSK ~850.

The FIM focuses on burden of care and measures both physical and cognitive disability [11]. It contains 18 items that are scored on seven-point ordinal scales based on the amount of assistance required [11, 15]. Thirteen items compose the motor subscale (FIM motor) and the remaining five items, the cognitive subscale [FIM cognitive; 16].

interRAI, an international research consortium, develops comprehensive assessment tools especially intended for older patients. Currently, there are 10 Resident Assessment Instruments (RAIs) designed for care settings across the continuum [16]. Each RAI tool consists of >300 items in- cluding specialised items exclusive to the specific setting as well as a proportion of common items intended to facilitate communication across the continuum [12, 16, 17].

There is evidence for the reliability and validity of both the FIM and the MDS. While there are extensive reports on the use of the FIM for older adults receiving inpatient rehabilitation, few MDS articles specifically focus on this population [14].

As the FIM is part of the National Rehabilitation Reporting System [NRS; 18] currently mandated for use in Ontario rehabilitation units, the FIM motor was collected in its usual manner for each institution. Prior to the PAC data collection