Assessment

The Hopkins Verbal Learning Test had high sensitivity and good specificity for detecting mild dementia in older people


QUESTION: Is the Hopkins Verbal Learning Test (HVLT) a reliable and valid screening test for mild dementia in older people? How does it compare with the Mini-Mental State Examination (MMSE)?

Design
Blinded comparison of HVLT and MMSE results with Diagnostic and Statistical Manual of Mental Disorder, fourth edition (DSM-IV) diagnoses of dementia (the diagnostic standard).

Setting
The Geriatric Psychiatry Service of the Royal Brisbane Hospital and District Health Service, Australia.

Patients
56 patients (mean age 75 y, 63% women, mean education 8.5 y) participated. Exclusion criteria were age < 65 years, hearing impairment, aphasia, MMSE score < 18, insufficient English, or inability to consent.

Description of tests and diagnostic standard
3 experienced registered nurses blinded to patients’ diagnostic status administered the HVLT and the MMSE. The maximum score possible for the HVLT total score was 36 and for the HVLT recognition score was 12. The maximum MMSE total score was 30. Each patient was assessed by an independent psychiatrist blinded to psychometric test results for the presence of dementia and other psychiatric diagnoses using DSM-IV criteria.

Main results
26 patients had DSM-IV dementia, 15 had psychiatric diagnoses other than dementia, and 15 were normal controls. Using ROC analysis, the optimal cut point for detecting dementia with the HVLT was 18/19 and for the MMSE was 25/26. For these cut points, the area under the ROC curve for the HVLT was 0.9288 and for the MMSE was 0.9269. The table shows the sensitivity, specificity, and positive and negative likelihood ratios for each test. The HVLT had better sensitivity than the MMSE, but the MMSE had higher specificity. Inter-rater reliability was high (> 0.99) and comparable for the 2 tests. Both HVLT and MMSE scores were positively correlated with education level.

Conclusion
The Hopkins Verbal Learning Test had high sensitivity and good specificity for detecting mild dementia in older people.

Test characteristics for detecting mild dementia

<table>
<thead>
<tr>
<th>Scale, cut point</th>
<th>Sensitivity (95% CI)</th>
<th>Specificity (CI)</th>
<th>Positive LR</th>
<th>Negative LR</th>
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<tbody>
<tr>
<td>HVLT, 18/19</td>
<td>96% (80 to 100)</td>
<td>80% (61 to 92)</td>
<td>4.80</td>
<td>0.05</td>
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<tr>
<td>MMSE, 25/26</td>
<td>88% (67 to 98)</td>
<td>93% (78 to 99)</td>
<td>12.57</td>
<td>0.13</td>
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</tbody>
</table>

*LR = likelihood ratio, HVLT = Hopkins Verbal Learning Test, MMSE = Mini-Mental State Examination. Diagnostic terms defined in glossary. CIs and LRs calculated from data in article.

COMMENTARY
The search for simple, reliable screening methods to detect cognitive impairment has led to the generation of numerous tests to assist in the early diagnosis of dementia.1 The MMSE, although commonly used for this purpose, is limited by a ceiling effect with maximum scores as education increases,2 thereby reducing the sensitivity of the test for highly educated individuals. Another disadvantage of the MMSE is that there are no alternative forms for repeated testing of the same individual. The HVLT is a brief verbal memory test that has 6 alternative forms and does not appear to have a ceiling effect.3

Frank and Byrne used a methodologically sound study design, with blinded assessments to reduce bias, and they analysed the correlation of scores with selected socio-demographic variables. The original article by Brandt emphasises the need for more extensive normative data,4 particularly related to age and education. Although the study by Frank and Byrne provides further estimates of norms, replication with a larger sample would be useful.

Although it is feasible for nurses to give either the HVLT or the MMSE, it is important to recognise that scores should not be interpreted as diagnoses, but as indicators of cognitive impairment that could be caused by various reversible or irreversible diagnoses. For nurses working in primary care settings (eg, rural or remote communities), the HVLT could be used to monitor cognitive function over time in relation to interview assessments and family reports of memory changes, and to help to decide when to refer the individual for a comprehensive assessment and early intervention, if indicated. The higher sensitivity of the HVLT is a strength over the MMSE, but the tests are similar in terms of their brief administration time (10 minutes) and high reliability.

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REFERENCES