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SHORT REPORT

Can doctors predict patients' abbreviated mental test scores

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Abstract

Objectives: the abbreviated mental test is widely used in the assessment of cognitive impairment in elderly patients. However, many doctors do not administer the full 10 questions, preferring to estimate the patient's score instead. We have studied the accuracy of doctors in predicting patients' abbreviated mental test scores.
Methods: we assessed 102 patients in the geriatric unit. We asked doctors to predict the patient's abbreviated mental test during the admission interview. A true abbreviated mental test was then recorded.
Results: mean age was 80.9 years with a male : female ratio of 27 : 74. The mean predicted abbreviated mental test score was 6.57 (SD 2.9); the mean actual abbreviated mental test score being 6.36 (SD 3.2). Comparing the two groups, abbreviated mental test scores were predicted most accurately at the extremes and correlation between the two groups of scores was high ($P < 0.001$ Spearman test). Kappa statistics revealed moderate agreement between the two groups, (0.56, 95% CI 0.48–0.63). A predicted score of 5/10 showed the greatest spread of true abbreviated mental test scores (0–10, mean 4.5). However in total, only 31% of the predicted abbreviated mental test scores were accurate, with 42% being incorrect by >1. Using the accepted cut-off of <7/10, this revealed that 13% were underdiagnosed and 19% were overdiagnosed as being cognitively impaired.
Conclusions: clinicians are poor at predicting abbreviated mental tests in the midrange but are more accurate at predicting lower and higher scores. This descriptive study reinforces the importance of using an objective assessment of cognitive impairment rather than clinicians estimating its presence or absence.

Keywords: *abbreviated mental test, cognitive assessment, cognitive impairment*

Introduction

Cognitive impairment is common in elderly people and is associated with an increased morbidity and mortality [1]. Dementia increases the rate of long-term hospitalization and institutional care [2].

Despite its high prevalence, the presence of cognitive impairment is poorly diagnosed and documented by both general practitioners (GPs) [3–5] and hospital physicians [6–9]. Many GPs rely on information given by informal carers when making a diagnosis of dementia, often omitting formal testing [5].

Many screening tests are available for the assessment of cognitive impairment. The Abbreviated Mental Test (AMT) is one of the commonest used in hospital and primary care. Originally derived from the longer Mental Test Score [10] by Hodkinson [11], the AMT is a ten-question test, a score of less than seven indicating cognitive impairment [11]. It is has been verified in a variety of clinical and research areas [12, 13]. It takes less than 2 min to complete [14], and is therefore practical for clinical use [15, 16]. The British Geriatrics Society and the Royal College of Physicians currently recommend the AMT as the instrument of choice for the initial assessment of older patients on admission to hospital.

Holmes and Gilbody [17] revealed important inconsistencies in the use of the AMT by psychiatrists and geriatricians. Doctors frequently failed to use the correct ten questions when performing the AMT and also scored the test inaccurately. They concluded that inconsistencies in using the AMT were likely to lead to inconsistencies in clinical practice. One of the reasons for variation commonly given by doctors is that it is

difficult to remember all the correct questions in the original AMT. Some physicians omit to ask all ten, instead preferring to estimate the patients' AMT score based on the perceived accuracy of answers up until that point in the interview or consultation.

The aim of this study was therefore to determine whether junior medical staff could accurately predict patients' AMT scores.

Methods

We assessed patients admitted or referred to the Department of Medicine for the Elderly in Stobhill Hospital, Glasgow during a four-month period. During this period, there were 990 admissions to the whole geriatric unit. Those included in the study were assessed on the ward, in the outpatient clinic or day hospital by a junior doctor (either a senior house officer or a specialist registrar). Most patients assessed by our department do not have previous documentation of their AMT. We excluded patients who already had an AMT recorded during the current admission.

Stobhill Hospital admits patients directly to the acute geriatric assessment wards as well as transferring patients from other areas in the hospital to the acute and rehabilitation beds. During the admitting or interviewing process, the doctor was asked to form an opinion of the patient's AMT based on how well the patient had answered routine questions used in clerking. This 'predicted' AMT was recorded on a standard data collection sheet. Using the original set of ten questions, a formal AMT was then performed and this 'actual' AMT was entered onto the same data sheet. As the same doctor who interviewed the patient also performed the subsequent AMT, questions asked during the interview such as 'how old are you' (which would have been relevant to the subsequent AMT assessment) were avoided. This was to prevent recall bias in patients or observer bias in the doctors.

Statistical analysis

We compared the predicted and actual AMT groups using the Spearman test, a rank order correlation co-efficient. We performed other statistics using SPSS for Windows (version 9.0.0). A probability value of $P<0.05$ was taken as statistically significant.

Results

We assessed 102 patients during the study period. The mean age was 80.9 years with a male : female ratio of 27 : 74. Most were seen in the acute geriatric assessment wards ($n=84$), the rest on rehabilitation wards ($n=10$), in the day hospital ($n=2$), on the medical receiving unit ($n=4$) and in the outpatient clinic ($n=1$).

The mean predicted AMT score was 6.6 (SD 2.9), with a median of 7 (IQR 5–10).

The mean actual AMT score was 6.4 (SD 3.2), with a median of 7 (IQR 4–9). Comparing the two groups, AMT scores were predicted most accurately at the extremes (3/5, 60% correct at predicted AMT=0/10; 14/26, 54% correct at predicted AMT=10/10). However, prediction of scores in the midrange were less accurate, with predicted scores of 2 or 3/10 being the worst (0/2, 0% correct at predicted AMT= 2/10; 0/3, 0% correct at predicted AMT=3/10). A predicted AMT score of 5/10 showed the greatest spread of actual AMT scores (0–10, mean 4.5), with the range lessening once more towards the extremes of scoring.

The assessment of agreement between data sets of this nature is complex. Correlation calculations on data derived from two similar measurements of the same entity will nearly always produce a statistically significant result. Here the correlation is $r_s=0.78$ ($P<0.001$, Spearman test). Agreement between observers can be calculated using the kappa statistic. Kappa for this data set gives a value of 0.56 (95% CI 0.48–0.63), indicating moderate agreement between the sets of observations.

In total, only 32/102 (31%) of the predicted AMT scores correlated exactly with predicted scores, with a trend towards overestimating AMT scores. 59/102 (58%) of the predicted AMT group were within ± 1 of the actual AMT, leaving 43/102 (42%) incorrect by >1. If a value of $\leqslant 7/10$ is taken to indicate evidence of cognitive impairment, 6/45 (13%) thought to be cognitively good had clinically significant impairment and 11/57 (19%) thought to be impaired were cognitively intact. Compared with the standard of the actual AMT score, again using the value $\leqslant 7/10$, the sensitivity of the predicted AMT score was 88%, and the specificity was 78%. The predictive value of a positive ($\leqslant 7$) predicted test is 80%. The predictive value of a negative (>7) predicted test is 86%.

Discussion

In this study we have shown that clinicians are poor at predicting AMT scores in the midrange, though they are more accurate at predicting lower or higher scores. This effect is expected as prediction of a score at the ends of an assessment range (0 and 10) is limited more by these 'ceilings' compared to predictions in the middle of the range. This convenience sample of patients also raises the possibility that systematic bias occurred in the study by excluding patients unrepresentative of the whole admission cohort.

Almost a fifth of patients were misdiagnosed as having the presence or absence of cognitive impairment

when assessed by interview alone. While we accept that decisions on patient care are not based solely on an AMT score being greater or less than seven out of ten, detection of any degree of cognitive impairment is important in discharge planning and in other decisions on care. Hence the importance of using an objective assessment of cognitive impairment to avoid inconsistencies in cognition assessment.

Holmes and Gilbody have shown that doctors are often inconsistent in their use of the AMT because of lack of knowledge of the test itself [17]. They pointed out that apparent differences in serial AMTs might not reflect change in the patient's cognition, but merely the differences in skills of the physicians involved. The same may apply if we omit to use formal testing in the first place, as physicians' abilities in estimating AMTs are variable too. One solution would be to incorporate pre-printed AMT lists into admitting documents to ensure that there are no inconsistencies in practice.

Assessment of cognitive function is not the only area in which doctors forgo formal testing, relying instead on clinical judgement in diagnosing and managing patients. For example the use of tools such as the Geriatric Depression Scale is often omitted when diagnosing the presence of depression. Similarly decisions on patient competency to consent to investigations and operations are usually based on clinical judgement alone. A paper by Kelly *et al.* [18] looked at agreement between physicians on competency rates of patients to consent to procedures. They showed that level of agreement—and hence consistency between clinicians—increased when a standard assessment tool was applied.

We therefore recommend that health care professionals using the AMT as part of the assessment of older people should use a repeatable, explicit instrument for testing (such as pre-printed sheets) to reduce the variability of assessment seen with using less formal methods.

Key points

- Cognitive impairment is common in elderly patients and is associated with an increase in morbidity and mortality.
- Many doctors omit formal testing, instead preferring to estimate patients' abbreviated mental test scores.
- Doctors are poor at predicting abbreviated mental test scores in the midrange but are more accurate at predicting higher or lower scores.
- About 1 in 5 of patients were misdiagnosed as having the presence or absence of cognitive impairment.
- Doctors should use the abbreviated mental test (in pre-printed format) to minimise inconsistencies in assessment of cognitive impairment.

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