Use of the abbreviated mental test to detect postoperative delirium in elderly people

Á. NÍ CHONCHUBHAIR, R. VALACIO, J. KELLY AND S. O’KEEFFE

Summary
We investigated the validity of the abbreviated mental test (AMT) as a guide to the diagnosis of delirium in 100 patients aged more than 65 yr. Patients were assessed using the AMT on the day before and on the third day after operation. Fifteen patients were delirious on the third postoperative day; 10 of 43 patients undergoing orthopaedic surgery and five of 57 patients undergoing non-orthopaedic surgery. Delirium developed in four of 16 patients with a preoperative AMT score less than 8 and in 11 of 84 patients with a preoperative AMT score of 8 or more. Patients who developed delirium had a greater decline in AMT score (mean 2.7 (sd 0.9)) than patients who did not develop delirium (0.7 (1.0)) (P < 0.001). The sensitivity and specificity of a decline in AMT score of 2 or more points after surgery for diagnosis of postoperative delirium were 93 % and 84 %, respectively. (Br. J. Anaesth. 1995; 75: 481–482)

Key words

Delirium (or acute confusional state), an acute mental syndrome caused by organic factors, is a common complication of surgery in elderly people and is associated with substantial morbidity and prolonged hospital stay [1, 2]. Delirium is often the presenting feature of physical illness or drug toxicity, and early diagnosis and treatment of the precipitating factors can shorten the duration and severity of delirium.

In spite of the frequency and importance of delirium, the diagnosis is often missed by medical and nursing staff. Routine use of bedside cognitive tests to document changes in mental function might help recognition of delirium in surgical patients. The abbreviated mental test (AMT) (table 1) is the most widely used brief cognitive test in the UK [3]. The aim of this study was to determine the validity of using a decline in AMT scores after surgery as a guide to the diagnosis of delirium in elderly patients.

Methods and results
We studied 100 patients aged more than 65 yr (mean age 74 yr; 63 females). The types of surgery were: hip fracture repair (n = 33); other orthopaedic (n = 10); urological (n = 15); biliary (n = 11); gastrointestinal (n = 13); and other (n = 18). Patients expected to remain in hospital less than 48 h after surgery and those with aphasia or deafness were excluded. The study was approved by the local Ethics Committees.

All patients were assessed using the AMT on the day before and on the third day after surgery. On the third postoperative day, a single experienced physician, who was not aware of the AMT scores, examined patients using the delirium assessment scale and determined which patients had delirium according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders (third edition) [4]. Potential causes of delirium were determined from the history, physical examination, medication review and relevant tests.

The sensitivity (or true positive rate) and specificity (or true negative rate) of the diagnosis of delirium were determined using various cut-off points for change in AMT score. Student’s t test was used to compare continuous variables and Fisher’s exact test to compare categorical data in patients with and without delirium. It was estimated that a sample size of 88 patients would provide 90 % power for detecting a two-fold difference between the proportion of patients developing delirium among patients with and without a decline of 2 or more points in AMT score; the sample size enrolled was

Table 1 Abbreviated mental test. Each correct answer scores one point

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<th>1. Age</th>
<th>2. Time (to nearest hour)</th>
<th>3. Address for recall at end of test: 42 West Street. (Ask patient to repeat the address to ensure it has been heard correctly)</th>
<th>4. Year</th>
<th>5. Name of hospital</th>
<th>6. Recognition of two persons (e.g. doctor, nurse)</th>
<th>7. Date of birth</th>
<th>8. Year of start of first world war</th>
<th>9. Name of monarch</th>
<th>10. Count backwards from 20 to 1</th>
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increased to 100 to allow for potential difficulties in follow-up.

Fifteen patients were delirious on the third postoperative day. Delirium developed in 10 (23%) of 43 patients undergoing orthopaedic surgery and in 5 (9%) of 57 patients undergoing non-orthopaedic surgery. One or more potential precipitating factors were identified in all patients with delirium, including chest infection (6), urinary tract infection (2), wound infection (1), heart failure (3), fluid or electrolyte imbalance (3) and medication toxicity (2).

There was no significant difference in mean AMT score before surgery between patients with (8.5 (SD 1.7)) or without delirium (8.9 (1.5)) (t = 1.0, df = 98, P < 0.2). Delirium developed in 4 (25%) of the 16 patients with a preoperative AMT score less than 8 and in 11 (13%) of the 84 patients with a preoperative AMT score of 8 or more (P = 0.2). Patients who developed delirium had a greater decline in AMT score after surgery (2.7 (0.9)) than patients who did not develop delirium (0.7 (1.0)) (t = 7.1, df = 98, P < 0.001).

The sensitivity and specificity of a decline in AMT scores of 2 or more points after surgery for diagnosis of postoperative delirium were 93% (14/15) and 84% (71/85), respectively. The sensitivity and specificity of a decline in AMT scores of 3 or more points were 67% (10/15) and 95% (81/85), respectively.

Comment

The results of the present study are consistent with those of many previous studies in showing an incidence of postoperative delirium of about 10% in elderly general surgical patients and of greater than 20% in patients undergoing orthopaedic surgery [1, 2]. Although it is likely that many preoperative and postoperative factors were important in the pathogenesis of delirium in our patients, the presence of potentially treatable postoperative medical or surgical complications in all delirious patients emphasizes the value of recognizing and investigating patients with delirium.

The AMT has been recommended for routine assessment of cognitive function in the elderly by the Royal College of Physicians and the British Geriatric Society [5]. Although the AMT examines relatively few cognitive domains, the brevity of this test implies that it is acceptable both to patients and to doctors [3]. Serial testing using the AMT is helpful in distinguishing the acute, and potentially reversible, decline in cognitive function of delirium from the chronic cognitive impairment of dementia. In elderly medical patients, an abrupt decline of 2 or more points in the AMT from a previously measured baseline is a sensitive and specific indicator of delirium [6].

Surgery and anaesthesia may be associated with transient impairment in psychometric tests in the days after operation, and these changes might be expected to reduce the specificity of serial AMT scores for the diagnosis of postoperative delirium. In fact, the results of this study indicate that a decline of 2 or more points after surgery has excellent sensitivity and specificity for diagnosing delirium. Thus this finding should lead to an immediate review of the patient, supplemented by a few simple investigations.

It is well established that pre-existing cognitive impairment is one of the most important risk factors for postoperative delirium [1]. In the present study, and in a previous study of almost 300 patients by Seymour and Vaz [2], postoperative delirium was more than twice as common among elderly patients with a preoperative AMT score less than 8 compared with patients scoring 8 or more. This result was not statistically significant in either study. Nevertheless, the agreement between the two studies together with the finding in elderly medical patients that an AMT score less than 8/10 is a sensitive and specific indicator of cognitive impairment [3] suggest that this cut-off may be useful for identifying patients who are at increased risk for developing postoperative delirium. These patients may benefit from particularly careful perioperative management and postoperative surveillance.

In general, delirium is easy to diagnose in acutely agitated patients. However, about 50% of patients with postoperative delirium are quietly confused, and delirium in these patients is frequently missed [1]. It is important that surgeons and anaesthetists should be able to recognize delirium in view of the frequency and importance of this condition in the older surgical patient. Detailed assessment of cognitive function is usually the domain of psychiatrists and geriatricians. The results of this study suggest that the AMT, which takes less than 1 min to perform, will be useful as a guide to the mental state of elderly surgical patients for other doctors. We recommend that the AMT should be performed before operation in all elderly people to identify those with cognitive impairment and to provide a baseline for assessing changes in the postoperative period.

References