thereby increasing the risk of cholangitis and thus the overall morbidity.

Both cholangiocarcinoma and pancreatic cancers were found more commonly in the elderly group. Metal stenting is performed in cases where surgery is not an option and this is reflected in the higher number of these stents in the elderly population with malignant strictures. In contrast, plastic stenting provides temporary relief of obstructive symptoms prior to more definitive surgical intervention. This is reflected in more frequent insertion of these stents in the younger population.

ERCP is being increasingly utilised in the elderly population at high risk undergoing invasive procedures. It remains a technically feasible and safe procedure with a low rate of complications in this population.

Key points

- ERCP is being increasingly utilised in the elderly population.
- ERCP in the elderly is a technically feasible procedure with a high success rate, comparable with a younger population.
- ERCP in the elderly is a safe procedure with a low complication risk, comparable with a younger population.

Conflicts of interest

There are no conflicts of interest.

Supplementary data

Supplementary data are available at *Age and Ageing* online.

A. R. AFTAB*, F. DONNELLAN, F. ZEB, G. COURTNEY
Department of Gastroenterology, St. Luke's Hospital, Kilkenny, Ireland
Email: aftabar@hotmail.com
*To whom correspondence should be addressed

References

1. Siegel JH, Kasmin FE. Biliary tract diseases in the elderly: management and outcomes. Gut 1997; 41: 433–5.
2. Nagenthiraja K, Ewertz M, Engholm G, Storm HH. Incidence and mortality of pancreatic cancer in the Nordic countries 1971–2000. Acta Oncol 2007; 46(8): 1064–9.
3. Patel T. Increasing incidence and mortality of primary intrahepatic cholangiocarcinoma in the United States. Hepatology 2001; 33: 1353–7.
4. Thomopoulos KC, Vagenas K, Assimakopoulos SF *et al.* Endoscopic retrogade cholangiopancreatography is safe and effective method for diagnosis and treatment of biliary and pancreatic disorders in octogenarians. Acta Gastroenterol Belg 2007; 70: 199–202.
5. Katsinelos P, Paroutoglou G, Kountouras J, Zavos C, Beltsis A, Tzovaras G. Efficacy and safety of therapeutic ERCP in patients 90 years of age and older. Gastrointest Endosc 2006; 63: 417–23.
6. McCune WS, Shorb PE, Moscovitz H. Endoscopic cannulation of the ampulla of Vater: a preliminary report. Ann Surg 1968; 167: 752–56.
7. Health in Ireland, Key Trends. 2007. www.dohc.ie/statistics.
8. Population Estimates (Thousand) by Age Group, Year and Sex. www.cso.ie.
9. Deans GT, Sedman P, Martin DF *et al.* Are complications of endoscopic sphincterotomy age related? Gut 1997; 41: 545–8.
10. Agarwal N, Sharma BC, Sarin SK. Endoscopic management of acute cholangitis in elderly patients. World J Gastroenterol 2006; 12: 6551–5.
11. Mitchell RM, O'Connor F, Dickey W. Endoscopic retrograde cholangiopancreatography is safe and effective in patients 90 years of age and older. Clin Gastroenterol 2003; 36: 72–4.
12. Clarke GA, Jacobson BC, Hammett RJ, Carr-Locke DL. The indications, utilization and safety of gastrointestinal endoscopy in an extremely elderly patient cohort. Endoscopy 2001; 33: 580–4.
13. Fritz E, Kirchgatterer A, Hubner D *et al.* ERCP is safe and effective in patients 80 years of age and older compared with younger patients. Gastrointest Endosc 2006; 64: 899–905.
14. Ashton CE, McNabb WR, Wilkinson ML, Lewis RR. Endoscopic retrograde cholangiopancreatography in elderly patients. Age Ageing 1998; 27: 683–8.
15. O'Connor HJ, Bhutta AS, Redmond PL, Carruthers DA. Suprapapillary fistulosphincterotomy at ERCP: a prospective study. Endoscopy 1997; 29: 266–70.

Screening instruments for delirium in older people with an acute medical illness

SIR—As a medical professional we are not especially good at diagnosing delirium in older people, with up to two-thirds of cases being either misdiagnosed or undetected [1]. This is largely due to many of the older people having dementia, with the features of delirium often difficult to distinguish. Delirium is associated with significant morbidity and mortality in older people, and their protracted hospital stays [2] have implications for finances and bed availability within our healthcare service. Any steps taken to improve the diagnosis and management of this syndrome would be of great benefit to both patients and the NHS.

The British Geriatrics Society (BGS) recently produced clinical guidelines to improve prevention, diagnosis and management of delirium in older people in hospital [3]. In these guidelines, diagnosis of delirium is aided by screening for cognitive impairment on admission using the Abbreviated Mental Test (AMT) or Mini-Mental State Examination (MMSE), followed by the CAM screening instrument to confirm delirium [4, 5].

Table 1. Sensitivity, specificity and predictive values of the screening tools for delirium in relation to DSM-IV criteria

Delirium rating scales items	Sensitivity (no.)	Specificity (no.)	Positive predictive value (no.)	Negative predictive value (no.)
CAM	0.909 (10/11)	0.961 (49/51)	0.833 (10/12)	0.980 (49/50)
Inattention	0.909 (10/11)	0.745 (38/51)	0.476 (10/21)	1.000 (38/38)
Disorganised thinking	0.818 (9/11)	0.784 (40/51)	0.562 (9/16)	1.000 (40/40)
Altered consciousness	0.545 (6/11)	0.863 (44/51)	0.461 (6/13)	0.898 (44/49)
Disorientation	0.818 (9/11)	0.627 (32/51)	0.391 (9/23)	1.000 (32/32)
Memory impairment	0.909 (10/11)	0.412 (21/51)	0.294 (10/34)	1.000 (21/21)
Perceptual disturbances	0.091 (1/11)	0.980 (50/51)	1.000 (1/1)	0.847 (50/59)
Psychomotor agitation	0.273 (3/11)	0.980 (50/51)	0.750 (3/4)	0.862 (50/58)
Psychomotor retardation	0.182 (2/11)	0.882 (45/51)	0.250 (2/8)	0.849 (45/53)
Altered sleep–wake cycle	0.454 (5/11)	0.941 (48/51)	0.833 (5/6)	0.906 (48/53)
Fluctuation	0.636 (7/11)	0.922 (47/51)	0.636 (7/11)	0.922 (47/51)
DSI	0.909 (10/11)	0.804 (41/51)	0.500 (10/20)	0.9854 (41/42)
Disorientation	1.000 (11/11)	0.784 (40/51)	0.524 (11/21)	1.000 (40/40)
Sleep disturbance	0.545 (6/11)	0.922 (47/51)	0.667 (6/9)	0.922 (47/51)
Perceptual disturbance	0.454 (5/11)	0.961 (49/51)	0.833 (5/6)	0.891 (49/55)
Psychomotor activity	0.454 (5/11)	1.000 (51/51)	1.000 (5/5)	0.895 (51/57)
Activity/disturbance of consciousness	0.454 (5/11)	0.941 (48/51)	0.625 (5/8)	0.889 (48/54)
General behaviour	0.727 (8/11)	0.961 (49/51)	0.889 (8/9)	0.942 (49/52)
Fluctuating behaviour	0.454 (5/11)	0.980 (50/51)	0.833 (5/6)	0.893 (50/56)

Every acute older people admission (62 in total) to a care of the elderly ward and a mixed general medical ward over a 6-week period in a teaching hospital in Newcastle upon Tyne was assessed for delirium using DSM-IV [6], the Delirium Symptom Interview (DSI) [7] and the Confusion Assessment Method (CAM) [5]. All the interviews were carried out by one of two medical SHOs (CY and NS). All patients were assessed with MMSE [8]. 'Delirium' was defined if patients fulfilled the DSM-IV criteria.

Twenty patients (32%) met the screening criteria for delirium on at least one of the three diagnostic instruments. Of these, only 11 met the diagnostic criteria for delirium according to DSM-IV; 10 were identified using either the CAM or DSI. However, each delirium rating scale failed to detect one case of DSM-IV-defined delirium. An additional two cases were CAM positive, and ten were DSI positive when DSM-IV criteria were not fulfilled. All the tools were in diagnostic agreement with only nine (81.8%) delirium patients. Compared with patients without delirium, patients with delirium had similar age (81.39 vs. 83.09, $P = 0.518$) but significantly lower MMSE scores (14.94 vs. 4.64, $P = 0.003$).

Both DSI and CAM showed similar high internal consistency (Cronbach alpha of 0.857 and 0.841, respectively). In DSI, most affected symptom domains were disorientation (33.9%), general behaviour (14.5%), sleep disturbances (14.5%) and psychomotor activity (12.9%). In CAM, memory impairment (54.8%) and disorientation (37.1%) were the most frequent symptoms, followed by inattention (33.9%) and altered level of consciousness (21.0%) (Table 1). High rates of memory impairment and disorientation may be attributed not only to delirium but also to underlying cognitive dysfunction in a significant proportion of the sample. Fifteen patients (24.2%) were unable to be assessed with MMSE because of their level of consciousness (coma or stu-

por), inability to communicate or rapidly deteriorating medical condition. This significant figure suggests that MMSE, which is dependent on patient collaboration, may not be an adequate instrument to use in older people with an acute medical illness.

Our results have raised some interesting questions. First, what is the most useful tool to use in an acute medical setting when screening for delirium? In the older people population with multiple co-morbidities and poor medical and physical condition, levels of consciousness and/or communication are frequently impaired, preventing the use of tools that rely on patient collaboration such as MMSE. Therefore, it appears that MMSE, although an efficient tool to exclude delirium, is not as useful to screen for delirium when patients are unable to interact.

So, which additional tool is best for screening for delirium? In reality, it is too time-consuming to consider a vast battery of tests, since in routine clinical practice we need a quick and reliable method. Of the 20 patients positively screened with delirium, 11 met the DSM-IV criteria, 20 met the DSI criteria and 12 met the CAM criteria. Although CAM and DSI seem to have high sensitivity to detect delirium, the biggest difference appears with respect to their positive predictive values, with DSI being over-inclusive and substantially higher rates of false positivity (when DSM-IV criteria are used as the gold standard for diagnosing delirium). This suggests that the screening procedure alone is not enough, and needs to be expanded to include more detailed clinical assessment incorporating clear and detailed items from the DSM-IV. When dealing with older people with an acute medical illness, with high rates of underlying cognitive impairment as detected in our study, clinical diagnosis of delirium is challenging, being difficult to distinguish from dementia especially if other sources of information are not available. A

detailed analysis of CAM and DSI (Table 1) shows that, as expected, disorientation and memory problems are not useful for diagnosis of delirium given the low positive predictive value. On the other hand, inattention and disturbance of consciousness seem to be more reliable symptoms for diagnosis of delirium, having the advantage of not requiring prolonged assessment.

Our study was conducted on a real group of acutely admitted older people being assessed by junior medical doctors. We confirmed that CAM, which is based on DSM-III-R, is a good screening instrument for delirium in this subset of patients because of its simplicity, suitability for non-communicating patients and psychometric proprieties. We should highlight the need for specific training to apply this scale, as recommended by Inouye [5], since it requires determining the level of consciousness and attention which are often difficult to assess. Although we also found the DSI usefulness in routine clinical practice, it can easily lead to over-diagnosing delirium when the DSM-IV criteria are used as the gold standard. Our study revealed that MMSE could not be used in a quarter of patients. Similarly, AMT (suggested in the BGS guidelines), although less complex as it is purely verbal, may be difficult to use in clinical practice in this context. Other assessment approaches, dependent more on clinical observation (e.g. of inattention and disturbance of consciousness), may therefore be more appropriate to screen for delirium without the necessity for cognitive assessment, as demonstrated in our study.

Our study represents a practical clinical implementation of the BGS guidelines for delirium. Diagnosis of delirium should be done by skilled professionals, with good knowledge of this clinical syndrome and confidence in applying reliable tools as part of routine clinical practice. Teaching these skills needs to be an essential part of the medical curriculum, so that junior clinicians are empowered to think about delirium and how to recognise it early. This in turn will contribute to earlier diagnosis and treatment of this syndrome.

Key points

- Recognition of delirium should be done by skilled professionals.
- We confirm that CAM is a good screening instrument for delirium in elderly with dementia. However, there is a further need for specific training to apply CAM, since it requires assessment of level of consciousness and attention.
- The usefulness of MMSE in elderly with delirium is limited, with one-quarter of the elderly not able to be assessed because of altered level of consciousness, inability to communicate or rapidly deteriorating medical condition.
- Delirium symptom instrument (DSI), although useful in diagnosing delirium, can easily lead to over-diagnosing

delirium when DSM-IV criteria are used as a golden standard.

CATHERINE YATES[1], NEIL STANLEY[2], JOAQUIM M. CEREJEIRA[1],
ROGER JAY[3], ELIZABETA B. MUKAETOVA-LADINSKA[1],*
[1]Institute for Ageing and Health, Newcastle University,
Newcastle upon Tyne, NE4 6BE, UK,
Email: Elizabeta.Mukaetova-Ladinska@ncl.ac.uk
[2]University Hospital of North Durham, North Road, Durham,
DH1 5TW, UK
[3]Department of Geriatric Medicine, Royal Victoria Infirmary,
Newcastle upon Tyne, NE1 4LP, UK
*To whom correspondence should be addressed

References

1. Foreman MD, Milisen K. Improving recognition of delirium in the elderly. Prim Psychiatry 2004; 2: 46–50.
2. Siddiqi N, House AO, Holmes JD. Occurrence and outcome of delirium in medical inpatients: a systematic literature review. Age Ageing 2006; 35: 350–64.
3. British Geriatrics Society. The prevention, diagnosis and management of delirium in older people. RCP. June 2006
4. Inouye SK, Bogardus ST, Charpentier PA et al. A multicomponent intervention to prevent delirium in hospitalised older patients. N Engl J Med 1999; 340: 669–76.
5. Inouye SK. The Confusion Assessment Method (CAM): Training Manual and Coding Guides 2003. Boston: Yale University School of Medicine, 2003.
6. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, . Washington, DC: APA, 1994.
7. Albert MS, Levkoff SE, Reilly C et al. The delirium symptom interview: an interview for the detection of delirium symptoms in hospitalized patients. J Geriatr Psychiatry Neurol 1992; 5: 14–21.
8. Folstein MF, Folstein SE, McHugh PR. Mini-Mental State. A practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res 1975; 12: 189–198.

C-reactive protein and memory function suggest antagonistic pleiotropy in very old nondemented subjects

SIR—A possible role of inflammation in the development of dementia [1] has led to investigations examining whether C-reactive protein (CRP), a systemic marker of inflammation, is associated with worse cognitive function and decline in old age. Elevated CRP has been associated with worse global and specific cognitive functioning [2–7], although other studies have found no relationship between CRP and cognition [8–10]. Most studies have examined samples averaging <75 years