

Delirium screening in older patients

Over half of older hospital inpatients have co-existing cognitive impairment but the majority do not have a preadmission diagnosis of dementia [1]. Delirium (acute confusional state) is highly prevalent, affecting around one-fifth of acute medical admissions and reaching rates of over 40% in the oldest old [2, 3]. Delirium, perhaps even more than dementia, is associated with high care needs and poor outcomes [4, 5], but is often poorly recognised by staff who are more focussed on physical aspects of illness, or may not be trained in the care of complex older patients [6, 7]. Recognition difficulties are compounded by the fluctuating nature of the condition and service issues, including workload pressures, and lack of continuity of care. Although there is consensus that screening for delirium is required in at-risk patients, there is uncertainty around how best to do this, specifically which tools to use as well as how to define those at risk and thus target screening [8, 9].

In this edition of *Age and Ageing*, Quispel-Aggenbach and colleagues report a systematic review [10] of studies examining the test accuracy of very short delirium screening instruments in older patients: only instruments taking <3 min to perform and which did not require lengthy training, clinical expertise or surrogate information (collateral history) were included. The authors make the important point that for delirium screening to be achievable across a large patient population and particularly across acute secondary care organisations, chosen tests must be feasible (quick, widely applicable and well-tolerated) whilst retaining adequate sensitivity and specificity. Surrogate information is a requirement of widely used (diagnostic) tools including the Confusion Assessment Method (CAM) [11] and the four 'A's (alertness, abbreviated mental test-4, attention (months backwards), acute change/fluctuation in mental status) test (4AT) [12] and may not be available especially at first assessment or may be time-consuming to obtain. Such tools are therefore inherently easier to use in the detection of incident versus prevalent delirium (assuming staff continuity/handover is adequate to monitor patient status over time).

Study setting, case-mix and inclusion/exclusion criteria of included studies was heterogeneous resulting in widely varying delirium rates ranging from 4% to 57% [10]. Notably, there was a relative lack of inclusive studies: exclusion criteria included pre-existing dementia, severe delirium and age over 80. Further, nearly all studies required informed consent from patients or 'consent from the patient's legal representative', probably better described as

'assent' since it is unlikely that all patients lacking capacity had power of attorney or equivalent *in situ*. The conflicting ethical considerations of meeting study consent requirements versus the need not to exclude those at risk is a major issue in general for studies in cognitively impaired patients. The above factors likely resulted in substantial selection bias and there is therefore some uncertainty around the generalisability of the results particularly to patients with known dementia.

Of the short screening instruments studied in the review, most included a cognitive assessment (e.g. abbreviated mental test-4, digit span, months of the year backwards), often focussed on attention whilst others were observational measures of level of arousal not requiring any direct patient testing (Observation Scale of Level of Arousal, Richmond Agitation and Sedation Scale) [10]. In contrast to arousal tests, cognitive tests may be impacted by patient factors such as dysphasia, illness severity, drowsiness, fatigue and severe deafness which may limit their applicability and may be low in dementia in the absence of delirium. Also, patients may not tolerate repeated demands to perform such tests. However, cognitive tests do have the advantage of providing a quantitative measure of level of deficit which can be compared over time. Sensitivity and specificity for delirium were high for several rapid screening tests, but only shown to be reproducible for Observation Scale of Level of Arousal and Richmond Agitation and Sedation Scale, both measures of arousal. Interestingly, test accuracy for all instruments was lower, and results were less reproducible, in patients with established dementia and in 'older patients' in whom rates of undiagnosed dementia and mild cognitive impairment (MCI) are known to be high [1, 3, 13].

Importantly, there was no difference in performance of instruments according to the professional background of the administering staff—similar results were obtained when nursing staff were used versus highly trained specialist research staff. This is an important finding regarding robustness of screening since there is uncertainty about the reproducibility of findings from studies using specialised research staff, including research psychiatrists, to the real-world setting.

Overall, the review provides evidence for the accuracy of very short screening instruments in delirium particularly those measuring level of arousal (Observation Scale of Level of Arousal, Richmond Agitation and Sedation Scale) with preliminary evidence that the Observation Scale of Level of Arousal plus SAVEAHAART (attention measured

by participants signalling each time an 'A' was heard when 'S-A-V-E-A-H-A-A-R-T' was read out) may also be useful in patients with co-existent dementia [10]. However, questions remain around how best to implement screening in routine clinical practice. Strategies need to be adapted according to clinical setting: in acute secondary care services, physical illness is the focus and thorough clinical work-up is routine, the clinical challenges are around the detection of co-morbid cognitive disorders (known vs. unknown dementia/MCI, transient cognitive impairment, delirium) with implications for communication, capacity and consent processes, discharge planning and long-term follow-up. In contrast, in community settings including long-term care, cognitive impairment is often known and the challenge is to detect new physical illness, often manifested as behavioural change (incident delirium).

At first assessment in secondary care, where there is often limited information on pre-morbid status, a cognitive test will provide a baseline record, including in those without a cognitive disorder [14] and could be performed in combination with a level of arousal measure (applicable even in untestable patients), and delirium diagnostic tool (CAM or 4AT) when collateral history or a period of observation is possible. A cognitive test is also an integral part of delirium risk/susceptibility tools that can be calculated automatically and may be useful in early sign-posting of care or where delirium diagnosis is difficult [15]. In post-acute wards or care homes where the patient's usual cognitive status is known, rapid delirium screening tests, particularly those with accuracy in dementia (Observation Scale of Level of Arousal/SAVEAHAART) [10] might be sufficient for routine use since the emphasis will be on identifying incident delirium. However, even very short tests will incur a non-negligible workload to staff: regular screening is required and all patients screening positive (potentially a large proportion) will need further assessment. Where screening is done by nurses, but diagnosis and investigation is done by doctors, systems need to be in place to ensure that information on those screening positive is transmitted reliably to the medical team. This could be facilitated by electronic systems but may be challenging to deliver in practice.

Key points

- Delirium screening tools must be feasible, short, well-tolerated and robust to administration by non-expert staff with minimal training.
- Screening must be applicable to all older patients, including those with dementia, and untestable patients.
- Level of arousal tests have high sensitivity and specificity for delirium probably including those with dementia.
- Delirium (cognitive) screening should be operationalized according to clinical setting (acute vs. long-term care), staff skill mix and availability of resources.
- Effective routine delirium screening requires that positive screens result in diagnostic work-up and changes to care.

Conflict of interest

None.

Funding

None.

SARAH T. PENDLEBURY^{1,2}

¹Departments of General (Internal) Medicine and Geratology, John Radcliffe hospital, Oxford OX3 9DU, UK

²Centre for Prevention of Stroke and Dementia, Nuffield Department of Clinical Neurosciences, John Radcliffe Hospital and the University of Oxford, Oxford OX3 9DU, UK

Address correspondence to: Dr Sarah Pendlebury, Centre for Prevention of Stroke and Dementia, Nuffield Department of Clinical Neurosciences, Level 6 West Wing, John Radcliffe Hospital, Oxford OX3 9DU, UK. Tel: +44 1865 231603.

Email: sarah.pendlebury@ndcn.ox.ac.uk

References

1. Sampson EL, Blanchard MR, Jones L, Tookman A, King M. Dementia in the acute hospital: prospective cohort study of prevalence and mortality. *Br J Psychiatry* 2009; 195: 61–6.
2. Meagher D, O'Regan N, Ryan D *et al.* Frequency of delirium and subsyndromal delirium in an adult acute hospital population. *Br J Psychiatry* 2014; 205: 478–85.
3. Pendlebury ST, Lovett NG, Smith SC *et al.* Observational, longitudinal study of delirium in consecutive unselected acute medical admissions: age-specific rates and associated factors, mortality and re-admission. *BMJ Open* 2015; 5: e007808.
4. Eeles EM, Hubbard RE, White SV, O'Mahony MS, Savva GM, Bayer AJ. Hospital use, institutionalisation and mortality associated with delirium. *Age Ageing* 2010; 39: 470–5.
5. Bradshaw LE, Goldberg SE, Lewis SA *et al.* Six-month outcomes following an emergency hospital admission for older adults with co-morbid mental health problems indicate complexity of care needs. *Age Ageing* 2013; 42: 582–8.
6. Inouye SK, Westendorp RG, Saczynski JS. Delirium in elderly people. *Lancet* 2014; 383: 911–22.
7. Bellelli G, Morandi A, Zanetti E *et al.* AIP delirium study group. Recognition and management of delirium among doctors, nurses, physiotherapists, and psychologists: an Italian survey. *Int Psychogeriatr* 2014; 26: 2093–102.
8. <http://www.bgs.org.uk/confusion-delirium/cga-toolkit-category/how-cga/cga-assessment/cga-specific-conditions/acute-confusion-delirium>
9. <https://www.rcplondon.ac.uk/file/1619/download?token=hguwRXID>
10. Quispel-Aggenbach DWP, Holtman GA, Zwartjes HAHT, Zuidema SU, Luijendijk HJ. Attention, arousal and other rapid bedside screening instruments for delirium in older patients: a systematic review of test accuracy studies. *Age Ageing* 2018; 00: 00–00. [NOTE TO PRODUCTION: please complete at proof stage].
11. Inouye SK, van Dyck CH, Alessi CA *et al.* Clarifying confusion: the confusion assessment method. A new method for detection of delirium. *Ann Intern Med* 1990; 113: 941–8.

12. Bellelli G, Morandi A, Davis DH *et al.* Validation of the 4AT, a new instrument for rapid delirium screening: a study in 234 hospitalised older people. *Age Ageing* 2014; 43: 496–502.
13. Jackson TA, MacLulich AM, Gladman JR, Lord JM, Sheehan B. Undiagnosed long-term cognitive impairment in acutely hospitalised older medical patients with delirium: a prospective cohort study. *Age Ageing* 2016; 45: 493–9.
14. Pendlebury ST, Klaus SP, Mather M, de Brito M, Wharton R. Routine cognitive screening in older patients admitted to acute medicine: Abbreviated Mental Test Score (AMTS) and subjective memory complaint versus Montreal Cognitive Assessment and IQCODE. *Age Ageing* 2015; 44: 1000–5.
15. Pendlebury ST, Lovett NG, Smith SC, Wharton R, Rothwell PM. Delirium risk stratification in consecutive unselected admissions to acute medicine: validation of a susceptibility score based on factors identified externally in pooled data for use at entry to the acute care pathway. *Age Ageing* 2017; 46: 226–31.