

Australian Society for Geriatric Medicine

Position Statement No.13

Delirium in Older People

1. Delirium is a syndrome characterized by the rapid onset of impaired attention that fluctuates, together with altered consciousness and impaired cognition. It may be the only sign of serious medical illness in an older person and should be urgently assessed.
2. Better prevention and treatment is needed to avoid the poor outcomes that result from delirium, especially increased rates of cognitive and functional decline, prolonged hospital stay, institutionalisation and mortality. Incident delirium rates represent a reasonable marker of the quality of care that patients receive.
3. Many risk factors predispose a patient to develop delirium. Together, these risk factors multiply the risk of developing delirium, rendering the patient vulnerable to any precipitating factors (causes) encountered.
4. All older persons should be assessed for risk factors for delirium on admission to hospital. These include dementia, polypharmacy, visual and hearing impairment, dehydration, functional disability, alcohol abuse, depression and advanced age. Many precipitating factors are described. Iatrogenic factors are unfortunately common and potentially avoidable.
5. Delirium is very common but is often not detected or misdiagnosed. Cognition should be considered a "vital sign" and cognitive assessment routinely performed. Patients at risk should be screened using a tool such as the Confusion Assessment Method.
6. Hospitals should adopt preventative strategies through changes in practice and clinical pathways. Established effective approaches include: identification of risk factors and managing these with care protocols in medical patients; and pre- and post-operative comprehensive geriatric assessment and daily review of fractured neck of femur patients. These strategies should be routine for the care of all older persons.
7. Investigations for common precipitating factors are usually needed unless clear, recent causes are identified. Specialised investigations may be needed in specific circumstances.
8. Management of delirium involves identifying and treating risk factors and precipitating factors, use of non-pharmacological and pharmacological measures to manage neuropsychiatric manifestations, and monitoring progress.
9. Non-pharmacological measures should always be utilised. These include: correction of dehydration (subcutaneous fluids if needed), malnutrition and sensory deficits; provision of reorientation, good quality communication and undisturbed sleep; encouraging self care and mobility; avoiding use of restraints or immobilising devices; and limiting room and staff changes. However, current hospital environments and practices rarely facilitate these measures.
10. Pharmacological measures are not always needed but should be considered to control distressing symptoms. Small doses of typical antipsychotics are effective and appropriate in the short term. Atypical antipsychotics should be used for patients with extrapyramidal features. Benzodiazepines are useful in alcohol and benzodiazepine withdrawal.
11. Delirium is best managed by a multidisciplinary team utilising comprehensive geriatric assessment in an appropriate environment with adequate staffing levels. Specialised delirium rooms are worthy of further evaluation. They would enhance awareness of delirium, allow training of staff in principles of geriatric care and enhance delirium research. Location with other geriatric services would facilitate sharing of staff and continuity of care of patients.
12. Education about delirium should be provided to clinical and allied health staff in basic curricula as well as continuing education programs.

This Position Statement represents the views of the Australian Society for Geriatric Medicine. This Statement was approved by the Federal Council of the ASGM on 14 September 2005. The preparation of this paper was coordinated by Dr Sean Maher.

BACKGROUND PAPER

Delirium is a syndrome characterized by the rapid onset of impairment of attention that fluctuates, together with altered consciousness and impaired cognition. It is commonly encountered in older people and is associated with increased rates of cognitive and functional decline, prolonged hospital stay, relocation to residential care and mortality. It is often either not diagnosed or is misdiagnosed. There is often a strong element of iatrogenicity in the precipitating factors contributing to many episodes of delirium, emphasizing the need for better quality of care of older people. Good quality studies regarding risk factors, prevention and prognosis exist for hospitalised patients. However, treatment of established delirium is consensus rather than evidence based and little is known about delirium in residential care. There is an urgent need to provide better quality comprehensive geriatric care which will require institutional and systemic changes.

Epidemiology

Rates of *prevalent* delirium (on admission to hospital) range from 10 - 24% and that of *incident* delirium (arising during hospital stay) is reported as up to 56% of older people hospital population.¹ Post-operative delirium has been reported in up to 61% of patients having fractured neck of femur surgery.² Delirium in nursing homes has been little studied but is more prevalent than in the general community.³

Aetiology

Delirium in older people should be viewed as a true geriatric syndrome with a multifactorial basis.⁴ Thus delirium is due to predisposing or risk factors, the presence of which renders an older person vulnerable to any precipitating factors (or "causes") that are encountered.⁵ Thus, a vulnerable patient may easily develop delirium with a minor event such as a urinary tract infection. A person with few or no risk factors would require severe or multiple precipitating events before their cognitive reserves are overwhelmed.

Numerous studies have identified risk factors for both prevalent and incident delirium.^{1,6} These include dementia, multiple medications, visual and hearing impairment, dehydration, multiple or severe chronic medical conditions, neurological damage, functional disability, advanced age, alcoholism and depression. Predictive models highlight that visual impairment, severe illness and dementia each treble the risk of delirium while dehydration doubles the risk.⁷ Multiple risk factors multiply,

rather than add, the relative risks for developing delirium. These data point to approaches for risk stratification as well as prevention.

Numerous precipitating factors, or causes, of delirium have been identified. These include severe acute illness, medications, addition of >3 new medications, infection, electrolyte and acid base disturbance, hypoxia or hypercapnia, heart failure, hepatic or renal failure, hypoglycaemia, pain, stroke, restraint use, immobilisation, indwelling catheter, alcohol and benzodiazepine withdrawal, iatrogenic events, and cardiac and orthopaedic surgery.⁸ Restraint use and malnutrition each quadruple the risk of delirium, whilst adding >3 medications and use of a bladder catheter each nearly treble the risk. Any iatrogenic event doubles the risk.⁷

Medications contribute to about 40% of cases of delirium.⁹ Older people have diminished renal excretion and hepatic metabolism and are more likely to have adverse effects even at lower doses. Psychoactive drugs and those that cross the blood brain barrier are most likely to cause delirium. Drugs with anticholinergic properties are particularly likely to cause delirium.¹⁰ Additionally, metabolites of some common drugs have anticholinergic properties and add to the total "anticholinergic burden".¹¹ Common classes of drugs implicated include antiparkinsonians, benzodiazepines, lithium, antidepressants, antipsychotics, anti-convulsants, antiarrhythmics, antihypertensives, histamine-2 receptor antagonists, corticosteroids, opiate analgesics, non-steroidal anti-inflammatories, over the counter and herbal preparations, antihistamines and antispasmodics.

Pathophysiology

Understanding of the pathophysiology of delirium is fragmentary. It is considered the result of multiple pathogenic mechanisms that impair cerebral oxidative metabolism and neuro-transmitter function and affect numerous brain regions.¹² A relative deficiency of acetylcholine and/or excess of dopamine is most important, although other neurotransmitters are certainly involved. There is widespread disruption of higher cortical functions in delirium. Anatomical correlates from EEG and neuroimaging show mostly right-sided dysfunction in prefrontal cortex, thalamus, fusiform cortex, posterior parietal cortex, and basal ganglia.¹³ Delirium may also partially be a response to stress. Steroids can induce delirium and hypothalamic-pituitary-adrenal axis abnormalities have been described in dementia and delirium.¹⁴

Prevention

There is now compelling literature confirming the feasibility of delirium prevention.¹⁵ Inouye et al. used a multi-component strategy using standardised protocols to manage six risk factors for delirium (cognitive impairment, sleep deprivation, immobility, visual and hearing impairment and dehydration).¹⁶ 852 patients were prospectively matched to usual care or intervention groups. The intervention group had a significantly lower incidence of delirium (9.9% vs 15%), reduced total number of days of delirium (105 vs 160) and episodes of delirium (62 vs 90). However, delirium severity and recurrence rates were similar, suggesting that prevention of the primary episode of delirium was the major effect. Higher rates of adherence to the protocols resulted in better rates of delirium prevention.¹⁷

Marcantonio et al. performed a randomised control trial in 126 hip fracture patients where usual care was compared with geriatrician consultation pre and post operatively, combined with daily visits and targeted recommendations based on structured protocols.¹⁸ Recommendations were made regarding analgesia, fluid/electrolyte balance, adequate oxygen delivery, medication review, bowel/bladder function, nutrition, early mobilisation and rehabilitation, prevention, detection and treatment of post operative complications, appropriate environmental stimuli and treatment of hyperactive delirium. The intervention group had a significantly reduced relative risk of developing delirium (RR 0.64) and even greater benefit for preventing severe delirium (RR 0.40).

Clinical Features

Prior to the onset of delirium, patients may appear irritable, bewildered or evasive. Delirium develops over hours to days and fluctuates, usually with lucid periods during the day and maximal disturbance at night. Impaired attention may result in a distractible or inert patient. Disorientation to time and short-term memory impairment are apparent. Thinking is disordered and is reflected by rambling, incoherent speech. Patients may exhibit obvious distress with paranoid delusions, misperceptions and visual hallucinations. Altered consciousness is reflected by impaired clarity of awareness with alertness ranging from vigilant through to coma.

Two forms of delirium are recognised. Hyperactive delirium is easily recognised and occurs in approximately 30% of cases. It presents with repetitive behaviours (e.g. plucking at sheets), wandering, hallucinations or

verbal and physical aggression.¹⁹ Hypoactive delirium is easily missed and occurs in about 25% of cases. Patients appear quiet and withdrawn and may be misdiagnosed with depression. A mixed pattern that fluctuates and includes lucid periods also occurs in about 45%.

Detection

Studies demonstrate that 32 - 67% of delirious patients in hospital are not diagnosed.²⁰ Cognitive assessment should be routinely performed for all older people admitted to hospital. An abnormal result should prompt further evaluation. Serial cognitive testing in those at risk of delirium has been advocated to detect incident delirium and to monitor progress.²¹ In this respect, cognition is regarded as a "vital sign". Several instruments for evaluating delirium are available. The Confusion Assessment Method (CAM) is used widely:²²

1. Acute onset & fluctuating course AND
2. Inattention AND
3. Disorganised thinking OR
4. Altered level of consciousness.

Based on DSM-III-R criteria, it has reported sensitivity > 94% and specificity > 90%. Training in the use of delirium screening tools is necessary for operators to achieve competence.

Diagnosis

Delirium remains a clinical diagnosis made on the basis of a detailed history, examination and relevant investigations. Establishing previous functional and cognitive status and recent events such as falls or medication changes is essential.

Investigations

The clinical picture should guide investigation, but if there are no obvious clues then a routine "screen" should be used to detect common causes. A reasonable screen includes FBE, U&E, glucose, calcium, liver function tests, cardiac enzymes, oxygen saturation, MSU if urinalysis is abnormal, CXR, and ECG. Other tests to consider include blood cultures, thyroid function tests, arterial blood gases, B12 and folate, CT brain, lumbar puncture and CSF exam, and EEG.

CT brain should not be routine unless there is a positive history of falls, anticoagulation or focal neurological signs. Lumbar puncture should be considered (after CT brain) if there is headache, meningism or no other source of fever. EEG may be helpful if the diagnosis is in doubt and occasionally assists in determining aetiology e.g. non-convulsive status epilepticus.

Management

Management involves identifying and treating risk factors and precipitating factors, use of non-pharmacological and pharmacological measures to manage neuropsychiatric manifestations, and monitoring progress.

Non Pharmacological Management

Measures recommended in the literature are mainly derived from established risk factors for delirium and follow an empiric approach that improvement is unlikely if risk factors are perpetuated. Dehydration should be corrected, with subcutaneous fluids if needed. One to three litres per day can be given via a butterfly needle easily resited by nursing staff.²³ Other measures are: to ensure adequate nutrition; correct sensory deficits with glasses and hearing aids; provide reorientation with clocks, schedules, calendars, meaningful personal items, a view outside and reassurance from family; preserve good quality communication; and encourage self-care and mobility. Restraints should be avoided and the use of immobilising devices such as catheters and intravenous fluids, room and staff changes should be minimised. Schedules should be altered to allow undisturbed sleep at night.²⁴

There have been few randomised studies showing benefits of this approach. Modest benefits have been seen in interventions for young and older surgical patients but little for older medical patients.²⁵ A recent randomised control trial compared usual care of patients with established delirium in general medical units with multidisciplinary care.²⁶ However, there was no benefit seen in resolution of delirium, length of stay or survival. The findings may emphasise the need for delirium management in wards dedicated to the care of older people.²⁷

The best model of care for managing established delirium is not clear. Flaherty et al. described the use of a "Delirium Room" situated within an Acute Care of the Elderly (ACE) unit.²⁸ Comprehensive geriatric assessment with multidisciplinary care was standard with 24 hour nursing supervision. Patients were managed free of restraints and needed less sedation. Others question the need for separate delirium units and argue that management in an ACE unit should be sufficient.²⁹ A randomised control trial is needed to evaluate cost effectiveness and outcomes of duration and severity of delirium, and cognitive and functional decline.

Delirium rooms would enhance awareness of delirium, allow training of staff in principles of geriatric care and enhance delirium research. Location with other geriatric services would facilitate sharing of staff and continuity of care of patients.

Pharmacological Management

Review of current medications with cessation of possible contributors to delirium is essential. Treatment with antipsychotics and other medications is not always needed and should be reserved for those with distressing symptoms or who represent a danger to themselves or others. There are no randomised control trials in older people to guide the choice of the most appropriate medications. Haloperidol is appropriate for short-term treatment. It produces relatively little postural hypotension, but can cause marked extrapyramidal side effects: akathisia, rigidity, tardive dyskinesia and, rarely, neuroleptic malignant syndrome. These side-effects are more likely with increasing dose, age and duration of therapy. Patients with extrapyramidal features (e.g. Lewy body Dementia or Parkinson's disease) should not be treated with haloperidol. Starting with small doses and increasing as needed is preferred. Doses of 0.5 - 1.0 mg once or twice daily are usually adequate. Very agitated patients may need doses of 1.0 - 2.5 mg S.C. or I.M.³⁰ Older people commonly receive relatively large or frequent doses, which result in over-sedation and increased risk of complications.

Atypical antipsychotics should be considered for patients with extrapyramidal syndromes, but there is insufficient evidence to prefer their use in other patients. Small doses should be used (e.g. risperidone 0.5mg or quetiapine 25mg daily). The risk of cerebrovascular events with atypical antipsychotics seems to be no greater than that with typical antipsychotics when used for treating behavioural symptoms in patients with dementia.³¹ Their short term use in uncomplicated delirium is still accepted.

Benzodiazepines are appropriate therapy for alcohol or drug withdrawal. They may be useful when anxiety symptoms are prominent, however, they may worsen confusion and sedation. Agents with a short half-life and no active metabolites are preferable (e.g. lorazepam 0.5mg or oxazepam 7.5mg daily). Intramuscular midazolam 1.25mg can be used for excessive agitation not responding to neuroleptic agents or where they are inappropriate (e.g. extrapyramidal disorders).

Duration

Delirium may be very persistent. In one study, delirium was present for up to one week in 60%, two weeks in 20%, four weeks in 15% and more than four weeks in 5%.³² Inattention, memory impairment and disorientation may be still present at up to 12 months and associated with poorer functional and cognitive outcomes.^{33, 34} This

may be due to persisting chronic illness, irreversible neuronal dysfunction or delirium becoming a chronic disorder in some patients.³⁵

Outcomes

Delirium increases the risk of adverse outcomes, including length of stay, complications, cognitive and functional decline, nursing home admission and mortality. An Australian prospective cohort study showed that delirium more than doubles hospital stay.³⁶ Cognitive decline is evident in survivors of delirium.^{33,34} In one study, the relative risk of developing dementia after delirium over 3 years was trebled.³⁷ This may reflect early cognitive impairment unmasked by acute illness and/or irreversible neuronal dysfunction.

Rates of falls, incontinence and pressure sores are more than trebled in hospital patients with delirium.³² Previously community dwelling patients are nearly three times more likely to need institutional care after delirium within six months after discharge.³² Delirium after hip fracture increases the risk of poor functional outcome, decline in ambulation and death or nursing home admission by nearly 3 times.³⁸

Development of delirium is associated with in hospital mortality rates of 25 - 33%.³⁹ McCusker et al. demonstrated delirium to be an independent marker for mortality in the 12 months after discharge, with a hazard ratio of 2.11 after adjustment for severity of acute illness and medical comorbidity.⁴⁰

Depression and post traumatic stress disorder have been described in survivors of delirium.⁴¹ Individual accounts emphasise significant distress.⁴²

Strategies to Reduce Delirium

Inouye et al. note the strong association between delirium and inadequate hospital care.⁴³ "Failure of care" is characterised in terms of iatrogenesis, failure to detect delirium, poor attitudes toward care of older people, hospitals' focus on technology and reduced lengths of stay and a loss of skilled nursing staff (on whom effective strategies to prevent delirium depend). Delirium is suggested as a marker of the quality of care that older patients receive.

Incident delirium as a marker of quality care represents some problems in that better detection will generate higher delirium rates. Low rates may mean inadequate detection and care. Prevalent delirium rates may indicate where case finding is actively undertaken. Adjustment for illness severity which influences delirium risk would

also be necessary for benchmarking between institutions.

Strategies to reduce delirium rates include (Adapted from Inouye et al.):⁴³

- Routine cognitive assessment and monitoring of mental status as a vital sign
- Practice changes to avoid precipitants of delirium eg alternatives to night sedation
- Clinical pathways to identify high risk patients, manage risk factors and for delirium management
- Maintain skilled staff in clinical roles
- Delirium education in all medical, nursing and allied health curricula
- Continuing education for medical, nursing and allied health emphasising geriatric care and delirium prevention
- Improved quality monitoring systems
- Establish environments that facilitate comprehensive geriatric assessment and high quality multidisciplinary care, including adequate staffing ratios

Implementation would involve expenditure but there should be significant savings from prevention of delirium with its attendant morbidities. Additionally, comprehensive quality geriatric care would address other geriatric syndromes that share risk factors with delirium, such as functional decline, falls, incontinence and pressure sores.

Conclusion

Delirium remains a major challenge for geriatricians and health services. It is very common and has significant morbidity and mortality. Implementation of strategies to prevent delirium is urgently needed. Not all delirium is preventable and the best way of managing patients with established delirium is not yet clear, but it is likely to require the services of a multidisciplinary team employing high quality comprehensive geriatric assessment and care. Management of delirium in community settings requires further study.

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