Diagnosis and Prevention of Delirium in Elderly People

Delirium is a common, often unrecognized condition that is associated with considerable morbidity and mortality. Several tools are available to help define and screen for delirium, but diagnosis ultimately relies upon the recognition of risk factors and keen observation of symptoms. A variety of management strategies, including supportive measures and pharmacotherapy, are available, as are simple preventive interventions.

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Each of us knows that when we are ill, it is harder to concentrate and carry out mental tasks. For many older people, however, especially those who are frail, the change in mental state that comes with acute illness is catastrophic. This acute change, in the face of an external cause, is delirium. Delirium is not just quantitatively different from the decreased ability to concentrate: it also differs qualitatively, by impacting on memory and judgement and even giving rise to hallucinations and delusions.

Delirium is a common and important condition, frequently unrecognized but associated with considerable morbidity and mortality. Prevalence estimates range between 15% and 60%, depending on the population studied and specific methodology used.[1-5] There is strong evidence that delirium predicts—and likely contributes to—poor patient outcomes.[3,6-10] Delirium has been associated with prolonged length of hospital stay and an increased risk of nosocomial complications. Decline in level of functioning and accelerated cognitive decline are routinely seen and associated with a greatly increased risk of nursing-home placement. Delirium has been associated with an increased risk of death in hospital and at 12-month follow-up.[10] These associations hold true even after controlling for illness severity, age and baseline functional and cognitive status.[6] Delirium may persist for weeks to months in a substantial proportion of elderly patients.[3,6-10]

Numerous studies have delineated the risk factors associated with delirium. These risk factors can be grouped into baseline (or predisposing) factors and acute (or precipitating) factors. Baseline factors include advanced age, preexisting cognitive or functional impairment, sensory impairment, and medical comorbidity.[11-16] Male gender and history of ethanol abuse also have been reported in some studies. Medications are the most common iatrogenic cause of delirium,[1] implicated in up to 40% of cases.[17] Commonly offending drugs include benzodiazepines, narcotics and medications with anticholinergic properties. Drug withdrawal must be considered, as well. Other precipitating factors include infections, cardiac decompensation, hypoxemia and metabolic abnormalities (particularly dehydration). Associated factors include low hemoglobin, uncontrolled pain and physical restraints. Delirium is quite common follow-

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Table 1

DSM-IV Criteria for Delirium

- Disturbance of consciousness (reduced clarity of awareness of the environment) with reduced ability to focus, sustain or shift attention
- Change in cognition (such as memory deficit, distortion, language disturbance) or development of a perceptual disturbance that is not better accounted for by a pre-existing established or evolving dementia
- Disturbance develops over a short period (usually hours to days) and tends to fluctuate during the course of the day
- Evidence from the history, physical examination or laboratory findings suggests that disturbance is caused by a medical condition, substance intoxication or medication side effects

Table 2

The Confusion Assessment Method (CAM)[22]

The diagnosis of delirium requires the presence of features 1 and 2 and either 3 or 4.

1. Acute change in mental status and fluctuating course

- Is there evidence of an acute change in cognition from the patient's baseline?
- Does the abnormal behavior fluctuate during the day (*i.e.,* tend to come and go, or increase and decrease in severity)?

2. Inattention

- Does the patient have difficulty focusing his/her attention (*i.e.,* easily distractible or has difficulty keeping track of what is being said)?

3. Disorganized thinking

- Is the patient's thinking disorganized or incoherent (*i.e.,* rambling or irrelevant conversation, unclear or illogical flow of ideas, or unpredictable switching from subject to subject)?

4. Altered level of consciousness

- Is the patient's mental status anything besides alert (*i.e.,* vigilant or hyperalert, lethargic or drowsy/easily aroused, stuporous or difficult to arouse, comatose or unarousable)?

ing anesthesia and surgery. The frail elderly with multiple predisposing risk factors require the presence of fewer precipitating factors to tip them into delirium.

Diagnosis

Delirium commonly is defined using the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria (Table 1).[18] There are several tools available to screen for delirium, including the Delirium Symptom Interview,[19] the Delirium Observation Screening Scale,[20] the NEECHAM confusion scale,[21] and the Confusion Assessment Method (CAM).[22] The CAM can achieve better than 95% sensitivity and specificity and does not take long to administer (Table 2).

Delirium is commonly underrecognized by nurses and physicians.[5,23-26] This is due in part to the misconception that all delirious patients are agitated, when in fact the hyperactive form of delirium represents only a minority of cases (Table 3). Delirious patients who are hypoactive or somnolent often go undetected, or are misdiagnosed as demented.[17,26] However, hypoactive delirium may be associated with poorer outcomes.[17,23,27] The likelihood that nurses will detect delirium during routine clinical care is lowest in the presence of dementia, high baseline delirium risk, and the hypoactive form of delirium.[26] Severe delirium is associated with worse outcomes than is mild delirium, and patients who do not meet the full criteria, but have

Table 3
Phenotypes of Delirium

Delirium with psychomotor agitation

- Paradymitic case: delirium tremens
- Hypervigilance, but distractibility
- Autonomic overactivity
- Psychomotor agitation, from restlessness to violence

Delirium with psychomotor retardation

- Paradymitic case: the patient between stupor and coma
- Decreased attention and arousal (you find yourself talking loudly to such patients, or vigorously rubbing their arms to stimulate them)

Mixed presentation (alternating psychomotor agitation and retardation)

some symptoms, of delirium have worse outcomes than if they had no or few symptoms.[28] Detection could be improved by documentation of baseline cognitive status, incorporating cognitive screening into routine clinical practice,[1,17] educational programs,[23] and clinical pathways.[1]

There is good evidence that delirium can be better detected when information on risk factors is ascertained on admission. This facilitates diagnosis and allows targeting of patients for intervention. However, most protocols employed in funded studies are not practically feasible to the extent that they can be applied in usual clinical settings.[12] Nurses are in a critical position to detect mental status changes and alert physicians to the development of delirium to allow for prompt work-up and management. Education of frontline nurses is desirable, although recommendations may not be fully incorporated, spontaneously, into the process of nursing care.[29]

Management

Detection. Management begins with recognition, and this is facilitated by routine cognitive assessment as a part of standard care for older patients.[1] Preoperative cognitive impairment, as measured by the Mini-Mental State Exam (MMSE),[4,30,31] or the Clock-Drawing Test (CDT),[32] appears to be a useful predictor of postoperative delirium. Detection also is facilitated by examining the patient's history. Families commonly find delirium in a loved one to be very alarming, and are keen to talk to a physician who realizes that "mom is not always like this."

Identification of underlying causes. Once delirium has been identified, appropriate investigations must be carried out to detect underlying causes. Investigations are guided by comprehensive assessment of the patient and include careful review of prescribed medications (with particular attention given to recent additions and/or dosage changes). Laboratory testing should include, at the minimum, a complete blood count, electrolytes and renal function tests, oxygen saturation, electrocardiogram, urinalysis and chest X-ray. Correction of electrolyte imbalance is associated with significant shortening in the duration of delirium.[33] Frail patients with delirium risk factors or mild delirium may not be able to feed themselves, and will therefore benefit from attention to ensure adequate hydration and nutrition.

Supportive measures include maintaining a consistent, comfortable and familiar environment. Involving the family, if possible, may foster a sense of security. If family members are able to spend time at the bedside, they can be encouraged to provide reorientation and/or distraction, and to assist with feeding, finding sensory aids, and accessing help for toileting. Consistency in staff—particularly of nursing staff—is desirable. Attempts should be made to provide a quiet, well-lit room which, preferably, includes an easily visible clock, a calendar and familiar items from home. Identifying sensory impairment, and ensuring that glasses and hearing aids are in place, need to be part of routine care. Whenever possible, medi-

cation schedules should allow uninterrupted sleep overnight. Restraints, both physical and chemical, are not only inhumane but are associated with increased severity of delirium. Ambulatory patients should be mobilized at least daily. Family members benefit from education and reassurance, as well. Unfortunately, such environmental strategies frequently are overlooked.[34]

Table 4
Delirium Prevention Interventions

- Routine cognitive screening on admission and during hospital stay
- Medication review to minimize use of deliriogenic medications
- Ensuring sensory aids (glasses, hearing aids) are in place
- Ensuring adequate intake of fluids and nutrition by providing assistance if necessary
- Early identification and treatment of dehydration
- Early mobilization
- Avoiding restraints (chemical and physical)
- Involving family members or employing sitters to calm and reorient

Pharmacologic management. In some cases of hyperactive delirium, agitation, aggression, or psychotic symptoms are so disturbing they pose a danger to the patient or others, and thus merit pharmacologic treatment. As the medications used to alleviate these symptoms can worsen confusion on their own, it is important to exercise caution in dosing. Empiric data on pharmacologic management of delirium is limited.[5] Haloperidol has been shown to be more useful than narcotics[35] and than lorazepam,[36] although benzodiazepines are used when delirium results from withdrawal from alcohol or from benzodiazepines themselves. Haloperidol may be used in combination with a benzodiazepine in order to reduce the doses and, thus, the adverse effects associated with each.[37] Haloperidol generally is considered the drug of choice because of its minimal anticholinergic effects, and should be prescribed in low doses, regularly, for a limited time period (*i.e.,* 0.5 mg every six hours for three days). Case reports of the atypical neuroleptics are promising.[38] There has been some interest in mianserin,[39,40] a relatively selective 5-HT2 receptor blocker, but there also are case reports of delirium being caused by this drug.[41]

Multifactorial intervention. Delirium is a multifactorial syndrome, and frail patients with more predisposing factors are at greater risk of developing delirium with minor insults. As such, the most effective intervention strategies will be multifactorial in nature and will be applied proactively. The principles of prevention and comprehensive management are similar and should be incorporated into routine standard of care.

A number of studies have evaluated the effectiveness of a variety of interventions to prevent delirium, with inconsistent results.[2,42] A nursing intervention in hip-fracture patients with no prior cognitive impairment, which included attention to sensory impairment and a nurse visitor who provided reorientation and consistency, resulted in a significant reduction in incident postoperative delirium.[16] Another nurse-led study demonstrated the beneficial effects of an intervention program which focused on early recognition and treatment of delirium in hip-fracture patients.[43] This study emphasized education of nursing staff, systematic cognitive screening and regularly scheduled pain medications, and resulted in decreased severity and shorter duration of delirium.[43] Proactive geriatric consultations, with attention to environmental issues, medications and metabolic abnormalities, reduced the postoperative incidence of delirium by over one third (severe cases of delirium reduced by one half) in elderly hip-fracture patients.[44] A combined geriatric-anesthesiologic intervention program focusing on intra- and postoperative medical complications in hip-fracture patients resulted in a lower incidence and shorter duration of

Table 5

Advice for Families of a Patient Who is Delirious

What is delirium?	Delirium is a sign that your family member is quite ill. At present, he/she has only limited control over what he/she does.
Will it get better?	Most patients with delirium show some degree of recovery. Many people recover completely, but many have persistent problems in some thought-process areas (especially memory). Time is the best test.
How long will it take to get better?	A rule of thumb is that, in someone who has had no memory problems before, recovery time is two to four times longer than the time interval between the delirium being apparent and treatment being started.
What can I do to help?	Reassure the patient. Especially if the patient is restless, evening visits (things usually get worse as it gets dark) are very helpful.

delirium, fewer postoperative complications and a shorter length of stay on the orthopedic unit.[45]

Earlier delirium intervention trials in elderly medical inpatients have yielded inconsistent results[2,46] but were plagued by limitations, such as small sample sizes and a very low incidence of delirium[47] or a very high prevalence of delirium.[48] An important study by Inouye *et al*[12] used a specially trained interdisciplinary team consisting of a geriatrician, nurses, therapists and volunteers on a general medicine service. Standardized intervention protocols were applied to targeted risk factors, including cognitive impairment, sleep deprivation, immobility, sensory impairment and dehydration. The intervention was successful in reducing the incidence and total number of days of delirium, compared to usual hospital care.

Supportive measures include maintaining a consistent, comfortable and familiar environment. Involving the family, if possible, may foster a sense of security. If family members are able to spend time at the bedside, they can be encouraged to provide reorientation and/or distraction, and to assist with feeding, finding sensory aids, and accessing help for toileting.

Conclusion

Delirium is a common and serious condition with important prognostic implications. Unfortunately, it commonly is underdiagnosed and suboptimally managed. Appropriate diagnosis and management of delirium will require raising general awareness and education of frontline staff. Simple preventive interventions (Table 4) are available and can result in substantial cost savings, as well as raising the standard of care of the hospitalized elderly. As noted, delirium is very stressful to patients and their families. We find it is worthwhile to explain to patients that they are "a bit mixed up now, but will get better" and to reassure them in that regard. Most patients who recover from delirium appear not to remember much about it, but those who do remember typically recall it as a very frightening experience. It also is useful to talk to families about what is going on. We usually cover several points in such a discussion (Table 5).

Treating patients with delirium is a challenge to physicians, particularly since one of our chief tools (the patient history) often is not available to us. It is a condition that can cause great anxiety and in which good care is critical. As such, it is an important test of our skills as physicians.

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