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Management of Delirium in Elderly Patients

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Delirium was described in the first century AD by Celsus as “*mental disorders such as hysteria, depression or mania, during fever or head trauma*”. The word delirium comes from the Latin *de* - away from and *lira* - furrow, meaning ‘the plough is out of the furrow’ or in more modern terms, ‘the train is off the track’. An even earlier description of a disorder with these features was known to Hippocrates as phrenitis and occurred in febrile patients. Delirium can be defined as a transient, reversible syndrome that is acute and fluctuating, and which occurs in the setting of a medical condition. The American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders defines delirium as a disturbance of consciousness and cognition that develops over a short period of time and fluctuates over time.

Epidemiology

The incidence has been shown to range from 14 – 56 percent of all hospitalised elderly patients. Postoperative delirium occurs in 15 – 53 percent of surgical patients over the age of 65 and up to 70 – 87 percent of the elderly in the ICU. At least 20 percent of the hospitalised patients over 65 each year in the U.S. experience complications due to delirium. There are few studies looking at pathophysiology and risk factors for delirium in the ICU. Among the hypotheses are neurotransmitter imbalance and inflammation. Neurotransmitter imbalance may include either an excess of dopamine or a depletion of acetylcholine. Inflammatory changes from endotoxins and cytokines likely contribute to delirium in the ICU. There are many factors associated with delirium. They are divided into potentially modifiable and non-modifiable risk factors. In the elderly, dementia is the most common risk factor, though non-modifiable risk factors can be present in up to two-thirds of cases. Other non-modifiable risk factors include age, history of neurologic disorders and multiple medical illnesses, especially chronic renal and liver disease. Gender may also play a role, as males are more predisposed to delirium than females.

Key factors with iatrogenic effects that we can modify include immobilisation, medications and sleep deprivation. One of the biggest offenders is medication. Almost one-third of all hospital admissions in elderly patients may be linked to drug-related problems or toxicity. In 2000, it was estimated that medication related problems caused 106,000 deaths annually at a cost of 85 billion dollars. The Beers criterion is a widely used consensus criteria for safe medication use in the elderly. The result is a list of drugs that should be avoided in the elderly patient for a variety of effects, to include mental status changes in addition to others. A more recent criterion is that of STOPP (Screening Tool of Older Person’s potentially inappropriate Prescriptions) which is organised by physiological systems and focuses on potential drug interactions. Recent literature seems to indicate this tool may perform better than the Beers criteria. The bottom line is that practitioners must be aware of the impact of medications on the elderly.

Signs and Symptoms

Delirium can be hypoactive, hyperactive or mixed, depending on psychomotor behaviour. Symptoms can be misinterpreted and delirium mistaken for dementia, depression or psychosis. Hypoactive type can be especially difficult to recognise in the ICU. Hypoactive type is characterised by lethargy and withdrawal. Hyperactive is associated with agitation and restlessness. A study by Peterson, et al. Found that hyperactive delirium was rare in ICU patients and hypoactive and mixed accounted for about 50 percent each.

Diagnosis

In the ICU, there are two tools that allow critical care practitioners to diagnose delirium. The Confusion Assessment Method for the ICU (CAM-ICU) seems to be more commonly used. It is a variation on the Confusion Assessment Method so that it can be administered to intubated patients. First, a sedation scale is used to assess level of consciousness. Then the CAM-ICU is used to evaluate four features of delirium, including acute or fluctuating course, inattention, altered level of consciousness and disorganised thinking.

An alternative method is the Intensive Care Delirium Screening Checklist (ICDSC). Due to its sensitivity of 99 percent, it has become a recommended screening tool. Again, level of consciousness is assessed. Then seven items on a checklist are assessed in those not in coma or stupor. These include inattentiveness, disorientation, hallucination delusion-psychosis, psychomotor agitation or retardation, inappropriate speech or mood, sleep/wake cycle disturbance and symptom fluctuation. A score of four or higher makes the diagnosis of delirium. The ICDSC also makes it possible to diagnose subsyndromal delirium, by scoring candidates on a 1 – 3 level scale, though little research is available on the topic. It is possible that subsyndromal delirium is a step along the continuum toward full-blown delirium.

Imaging is of little help in making the diagnosis. CT scan findings of cortical atrophy in the various regions of the brain, as well as the deep structures, can be non-specific. However, these findings may be a marker of increased susceptibility of the brain to insults.

Prognosis

Delirium is associated with poor outcomes in ICU patients. Complications and poor outcomes associated with delirium include self-extubation, failed extubation, removal of indwelling catheters and increased mortality. Long-term cognitive function in ICU patients with delirium may be affected as well. Patients with dementia and delirium suffer worse outcomes than with dementia alone. Non-ICU studies have suggested the more severe the delirium the worse the outcome. Delirium also increases further hospitalisation and institutionalisation. A recent study by Balas and co-workers showed delirium in surgical ICU patients was an independent predictor for being discharged to a place other than home. Patients in the study who were delirious also had a greater functional decline.

The Cost of Delirium

Delirium is now considered a quality measure by the National Quality Measures Clearinghouse™ of the Agency for Healthcare Research and Quality. Though it seems delirium correlates with lower quality of care, the analysis must take into consideration case mix index and severity of illness. In an article from 2000, delirium was identified as one of the twenty-one conditions targeted for quality of care improvement in the elderly.

Studies further show that delirium results in increased nursing time per patient, higher hospital costs, and an increased length of hospital stay. The cost of delirium in US hospitals is high. According to Inouye, the costs attributable to delirium are approximately 2,500 dollars per patient per hospitalisation. This leads to a figure of 6.9 billion dollars in Medicare expenditure using 2004 figures. This is only the beginning. This does not include the costs of long-term and rehabilitation care or in-home services. Leslie et al. studied one-year health costs associated with delirium. Per patient, it was estimated that total costs ranged from 16,000 to 64,000 dollars. This would result in a national figure ranging from 38 to 152 billion dollars per year. This is comparable to the costs for falls and diabetes and should drive measures to prevent delirium in hospitalised patients.

Prevention and Treatment

It is estimated that at least 30 – 40 percent of cases of delirium are preventable. Few studies have examined prevention strategies in the critically ill patient. As indicated previously, inappropriate medications in the elderly should be avoided. Lessons can be learned from non-ICU studies. Multi-component intervention was the focus of a landmark study by Inouye et al. The Hospital Elder Life Program (HELP) promoted by this work is an innovative strategy of hospital care for elderly patients, which uses tested delirium prevention strategies to improve overall quality of hospital care. In that controlled trial, delirium developed in 9.9 percent of the intervention group, compared with 15.0 percent of the usual-care group. The HELP interventions can also effectively reduce the total number of episodes and days of delirium.

Proactive geriatric consultation also reduces risk of delirium after acute hip fracture. In a study by Marcantonio and coworkers, geriatric consultation reduced delirium by over one-third and severe delirium by over 50 percent. In our trauma centre, we use such a geriatric consultation protocol and reported improved outcomes in a previous contribution to this journal.

Non-Pharmacologic Treatment Strategies

There are many non-pharmacologic measures that can help but are most effective as part of a multi-component approach as above. The emphasis is on reorientation and behavioural intervention. Caregivers should use clear instructions and make frequent eye contact with patients. Sensory impairments, such as vision and hearing loss, should be minimised. Physical restraints should be avoided because they lead to decreased mobility, increased agitation, greater risk of injury, and prolongation of delirium. Attempts should be made to limit room and staff changes and providing a quiet patient-care setting. Use low-level lighting and minimal noise at night. The use of a non-pharmacological sleep protocol can reduce the use of sleeping medications from 54 percent to 31 percent. Such a protocol consists of a glass of warm milk or herbal tea, relaxation tapes or relaxing music and a back massage.

Pharmacologic Treatment

Pharmacologic treatment begins with the avoidance of inappropriate medications, something that cannot be stressed enough. Prior to instituting new medications, non-pharmacologic prevention strategies should be in place and life-threatening conditions such as shock, hypoglycaemia and hypoxia should be corrected.

A few words of caution are indicated before using pharmacologic treatment. Medications used to treat delirium can have paradoxical effect and thus worsen delirium or over-sedate the patient. The data is not good for the efficacy of such interventions. And remember the mantra of geriatric medication: start low, go slow...but GO. Use the minimum dose needed for the shortest duration necessary.

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The drug of choice for delirium according to guidelines published by the Society of Critical Care Medicine and the American Psychiatric Association is still haloperidol. Through blocking D2 dopamine receptors, haloperidol reduces hallucinations, thought disturbance and delusions. A randomised double blind, placebo controlled study in elderly hip fracture patients demonstrated a reduction in severity and duration of postoperative delirium with 1.5mg of prophylactic haloperidol per day. The incidence of delirium was unchanged compared to placebo. So far, the ICU literature has not supported the use of atypical antipsychotics.

Conclusions

In summary, delirium is a serious cause and complication of hospitalisation in the elderly patient and should be considered a medical emergency until proven otherwise. Delirium adversely affects the overall outcome and prognosis of critically ill patients as well as substantially increasing healthcare utilisation and costs. Prevention measures, especially multi-component interventions are effective in reducing delirium and should be employed in all acute care facilities caring for elderly patients so we can get the plough back on course.

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