Delirium in Critically Ill Emergency Patients

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In recent years delirium has been getting a lot of attention in critically ill patients and has been associated with increased risk of mortality, prolonged ICU stay, significant long-term effect and impairment. Delirium in any patient is daunting on the patient, their families and to our health care system. Since the 2013 guideline for pain, agitation and delirium routine screening and monitoring has been recommended and can be facilitated using the delirium check list (see Figure 1). Delirium alerts providers to a perilous process that is associated with poor outcomes. While it is unclear if delirium itself is the cause for this elevated consequence, there is a connection.

Delirium should be categorized by suspected subtype etiology so that treatment can be catered. Hyperactive delirium is more easily recognized given its more outwardly visible presentation. Whereas hypoactive delirium is perhaps more occult given presentation of lethargy and hypovigilance. This can often be assumed as “resting”, when in fact is a form of delirium and thereby undertreated. Mixed type delirium is more difficult to treat given that patients may experience elements of both previous noted subtypes in a short amount of time.

Vulnerable Populations

Special consideration should be taken for vulnerable patient populations such as the elderly and pediatric populations. Both have propensity for long term neurological effects and higher mortality.

Elderly patients are at highest risk for delirium due to co-morbidities such as hearing and visual loss. Nearly 30 percent of admitted elderly patients will exhibit delirium at some point during a hospital stay. Incidence rises to 50 percent in elderly patients admitted for complex surgical procedures. One study suggested that patients with more severe delirium after hip surgery, including psychomotor agitation, had higher rates of mortality and nursing home placement. Furthermore, delirium that does not resolve before discharge is also a risk factor for nursing home placement.

Factors that increase the risk for delirium and confusion in all patients including traumatic brain injury; in the elderly, include dementia, stroke, Parkinson’s. Extrinsic factors include medications, sepsis, drugs, dehydration, and situational changes.

Differential Diagnosis

A broad differential diagnosis in the emergency department is crucial and extensive. Workup should commence first an foremost by ruling out catastrophic processes such as hypoglycemia, infection cerebral vascular accident, traumatic brain injury, sun-downing, non-convulsant seizure, psychosis, and delirium tremens, just to name a few.

Many medications can cause delirium and should be considered when attempting to identify cause of acute change in mentation. 30 percent of all cases of delirium are associated with drug toxicity. In the ICU, worsening of the underline condition should be considered or complication related to the hospitalization, medication.

In admitted patients with established medical diagnosis who develop altered mentation, potential worsening of the underline process should be the priority focus. For example, avoiding the mistake of attributing new altered mention in a patient admitted for acute stroke to delirium when in fact, the cause is progression of ischemia or secondary injury.

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Delirium vs. Dementia
Delirium and dementia can be confused. Delirium disturbs attention versus dementia distorts memory. Delirium typically has a sudden onset with a clear onset, whereas dementia typically has an uncertain onset, is slow to start and gradual in progression. Confusion can be due to either, especially in the acute phases of delirium or the onset of dementia. Evaluation to differentiate the two is crucial in order to appropriately treat and or mitigate long term effects.

Evaluation
Evaluation and examination are difficulty in assessing delirium since the majority of history is dependent on secondary account. Family and friend provided history may elucidate a state of “just not right” or “just not himself/herself today”. Not eating or drinking as usual may also be a presenting sign. A thorough physical exam including a complete neurological exam is critical to rule out source of altered mentation as well as diagnose altered mentation in and of itself.

Clinical instruments such as the Intensive Care Delirium Screening Checklist (ICDSC) or the Confusion Assessment Method for ICU (CAM-ICU) tool should be incorporated in to emergency department workup and in ICU daily in-patient evaluation to aid in early and correct diagnosis of delirium.2,3 The ICDSC is a screening checklist of eight items and administered daily, with sensitivity 99 percent sensitivity and 64 percent specificity for early detection of delirium. Critics of the ICDSC tool, make note that the tool was studied in ICU patients with mainly medical, cardiovascular and surgical disease and not validated for emergency medicine use. The CAM-ICU score takes 5 minutes to assess and has a sensitivity of 94-100 percent and a specificity of 90-95 percent.12,13 A review of 11 bedside instruments used to identify the presence of delirium in adults supported the use of the CAM-ICU as the best, and the Mini Mental State Exam as the least accurate tool.14 (Figure 1, Figure 2)

Laboratory tests may elucidate sources of acute altered mention. Workup should include but not limited to thyroid functions, vitamin B12 level, uranalysis, CBC for evidence of acute infection, with known limitation in elderly who may or may not mount fevers or leukocytosis, lumbar puncture to identify meningitis when other sources of infection have not been identified.

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Figure 2: CAM-ICU Method

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Treatment
While correct identification and classification is paramount, equally is treatment. There is no magic bullet to treat delirium, especially as each patient’s individual medical process is different, making broad recommendations for whole populations difficult.

First steps include treating the underlying cause of the delirium such as antibiotics for bacterial infections, mitigating agents for acute drug withdrawal, cessation of drug induced delirium, reduce location changes.

Non-pharmacological agents should be attempted as first line treatment; verbal reorientation, early ambulation, clock in visual field of patient, windows and good lighting, and avoiding sleep-wake cycle disturbances. Units that addressed these ambient factors have shown to have decreased incidence of delirium.15-18 More and more guidelines include “Family engagement/empowerment”. We too often discard or ignore family members by having restricted access to the department or the ICU. Family members can be trained in assisting, re-orientating, and participating in plan of care. Harnessing their bedside presence can be a useful way to limit medication use and time consumption/frustration by the medical team.

Current evidence does not support the use of any medications in order to prevent delirium. Haloperidol did not prevent delirium in ICU patients in the REDUCE trial.19 While Haloperidol remains the mainstay of treatment and can be given orally, intramuscular or intravenous, the current recommendation is to avoid routine treatment with Haloperidol and or other medication. Patients who are agitated and could potentially harm themselves or others may benefit from short term, low doses of Haloperidol. Of note, intravenous administration is associated with prolonged QT and should be monitored.

In one study, haloperidol and chlorpromazine showed improvement in delirium compared to lorazepam.20 Risperidone (0.5 mg every 12 hours) was associated with a reduced incidence of clinical delirium in post cardiac surgery patients.21 Quetiapine, risperidone, ziprasidone, and olanzapine have fewer side effects compared to haloperidol, and in small studies they appear to have similar efficacy to the former.22-24 Cholinesterase inhibitors have been proposed to prevent delirium in selected patients, but these, too, have not shown efficacy towards prevention.25-27 Gabapentin and melatonin have shown some efficacy in reducing delirium namely by reducing pain and improving sleep cycles, respectively.28-30

Whether in the ICU or the emergency department, mechanically ventilated patients are at high risk to develop delirium. The New Clinical Practice Guidelines for the Prevention and Management of Pain, Agitation/ Sedation, Delirium, Immobility, and Sleep Disruption in Adult Patients in the ICU recommends avoidance of haloperidol, use of dexmedetomidine or propofol as a sedative agent that also reduces days of delirium and ventilator days.30
Benzodiazepines have a limited role in the treatment of delirium; they are primarily used as a sedative drug, treatment for alcohol withdrawal or when neuroleptic drugs are contraindicated. Benzodiazepines use is associated with poor outcomes in ICU patients and in elderly populations.\(^{20,31-34}\)

Physical restraints should only be used as last resort and in conjunction with pharmacological agents to mitigate symptoms. Isolated use of restraints increases likelihood of rhabdomyolysis, acute kidney injury, hyperthermia and death.

In general, symptomatic treatment is not used for hypoactive delirium. One study suggested that patients with hypoactive delirium have a similar response to treatment with haloperidol as those who were agitated.\(^{35}\)

Some case reports have attempted to show use of stimulants to mitigate hypoactive delirium with no avail.

### Conclusion

Delirium has a significant impact on patients and is associated with poor outcomes, highest in older patient populations. Delirium is not only associated with higher mortality, it is also associated with prolonged hospital stays, likelihood for nursing home stays as opposed to discharge to home, overall functional and cognitive decline. Delirium impacts patients as well as family members. Early recognition and treatment of both the underlying cause and outward presentation are paramount to reduce days of delirium and reduce the potential for long term affects. Currently, there is no concrete treatment option for delirium; some are better than others, but none are ideal. More studies need to be done to better understand delirium and treatment options.

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### References

4. European Delirium Association; American Delirium Society. The DSM-5 criteria, response to treatment with haloperidol as those who were agitated.