AO TRAUMA

Orthogeriatrics—Clinical Summary Document

Delirium

Definition

There are four key features that characterize delirium:

- Disturbance of consciousness with reduced ability to focus, sustain, or shift attention
- The disturbance develops over a short period of time (usually hours to days) and tends to fluctuate during the course of the day
- A change in cognition or the development of a perceptual disturbance that is not better accounted for by a preexisting, established, or evolving dementia
- There is evidence from the history, physical examination, or laboratory findings that the disturbance is due to a medical condition, substance intoxication, or medication side effects

Additional features that may accompany delirium include:

- Psychomotor behavioral disturbances such as hypoactivity, and impairment in sleep duration, euphoria, and affect
- Variable emotional disturbances, including fear, depression, euphoria, or perplexity

Prevalence

The prevalence of delirium is strongly correlated to the population and the risk setting. While the rate of delirium is estimated to be 5–55% for elderly general hospital admissions and 16–32% for elderly emergency department attenders, the prevalence rises to 75% postoperatively (hip and vascular surgery). The wide range of results between different studies may be explained by the difficulties in correctly diagnosing delirium. Furthermore, other terms, such as acute brain failure, acute state of confusion, acute organic brain syndrome, cerebral insufficiency, encephalopathy, postoperative psychosis, or toxic psychosis are still used to describe delirium.

Diagnosis and clinical signs

Up to 70% of patients with delirium are not recognized by clinicians. One reason is that delirium has various clinical manifestations. On the one hand, it is straightforward to identify a patient with the hyperactive form of delirium; these patients have increased psychomotor activity, agitation, aggression, mood changes, and in some cases, hallucinations and delusions. On the other hand, it can be very difficult to detect a patient in a hypoactive state. This form is characterized by decreased psychomotor activity, lethargy, drowsiness, apathy, or confusion. Furthermore, the clinical features often change over a period of 24 hours. Conversation with the patient may elicit memory difficulties, disorientation, or speech that is tangential, disorganized, or incoherent. Clinicians should be aware of superficially appropriate conversation that follows social norms but is poor in content. It is important that clinicians are sensitive to the patient's flow of thought and not attribute tangential or disorganized speech to age, dementia, or fatigue.

Standardized tools may help to simply and quickly diagnose delirium.

Confusion Assessment Method (CAM score)

The Confusion Assessment Method (CAM) is a widely used delirium screening instrument based on DSM-III-R criteria [1]. It provides a standardized method to enable clinicians to identify patients with

delirium and is the tool that is best supported by evidence. It has a sensitivity of 94% (95% CI, 91–97%) and a specificity of 89% (95% CI, 85–94%). Ideally, the CAM is based on observations made during a clinical interview including a brief cognitive assessment, such as the Mini Mental State Examination or the Mini-Cog Test. Administration takes 5–10 minutes.

Confusion Assessment Method: Training Manual and Coding Guide, Copyright 2003, Hospital Elder Life Program, LLC, the questionnaire and shortened version are available at http://hospitalelderlifeprogram.org/

Delirium Observation Scale (DOS)

The DOS final score is calculated from the three scores per day and divided by three. If the final score is 3 or more, delirium is likely.

The patient:

	Never	Sometimes or always	Unable
Dozes off during conversation or activities	0	1	-
Is easily distracted by stimuli from the environment	0	1	-
Maintains attention to conversation or action	1	0	-
Does not finish question or answer	0	1	-
Gives answers that do not fit the question	0	1	-
Reacts slowly to instructions	0	1	-
Thinks they are somewhere else	0	1	-
Knows which part of the day it is	1	0	-
Remembers recent events	1	0	-
Is picking, disorderly, restless	0	1	-
Pulls intravenous tubing, feeding tubes, catheters, etc.	0	1	-
Is easily or suddenly emotional	0	1	-
Sees/hears things which are not there	0	1	-

Clinical significance of delirium

Delirium is an independent risk factor for length of hospitalization, an increase in functional impairment, complications (eg, urinary incontinence, falls, decubitus ulcers), and admission to a nursing home. Mortality rate is high, affecting up to 30% of patients. One third recovers from delirium while the rest remains with a decline of cognitive function. Delirium is always an acute medical emergency. It requires an adequate diagnostic process, and treatment should be initiated by experienced physicians. Guidelines for diagnosis and treatment of delirium can be a helpful tool when an experienced clinician is not available.

Causes and risk factors for delirium

Common causes of delirium are:

- Brain disorders (eg, dementia, hematoma, Parkinson's disease)
- Metabolic derangements (eg, hypoglycemia, hypo/hypernatremia)
- Systemic organ failure (eg, heart failure, renal failure)
- Toxins (eg, alcohol, prescription medications)
- Physical disorders (eg, trauma with systemic inflammatory response syndrome, hypothermia)

Particularly for the older adult, chronic alcohol abuse is a rare reason for delirium. More common in this age group is benzodiazepine abuse. An immediate withdrawal of this medication can induce delirium. As a consequence of the factors listed above, delirium is one of the most prevalent complications among hospitalized geriatric patients (up to 61% in patients with a hip fracture).

Common risk factors are:

- Older age
- Preexisting cognitive impairment
- Severe comorbidities
- Visual or hearing impairment
- Major fractures (eg, hip fracture)

Triggers may be:

- Physical restraints or tethers (eg, extension, bed grids, urinary catheters, drainages)
- Impaired perception of the environment (eg, glasses, hearing aids)
- Medical complications
- Taking more than three medications
- Malnutrition
- Dehydration and derangement of electrolytes
- Pain
- Anesthesia
- Withdrawal of benzodiazepines or alcohol

<u>Ten signs of delirium:</u>

1. Acute onset
2. Duration is hours, days, or months
3. Fluctuating course (often worse at night)
4. Altered consciousness
5. Impaired attention
6. Impaired memory
7. Impaired orientation
8. Incoherent, slow, or rapid speech
9. Disorganized or incoherent thinking
10. Altered perception

Risk Model for Delirium [2]

Predisposing risk factors for delirium	Points
Delirium during previous hospitalization	5
Dementia	5
Clock drawing test (displaying ten past eleven)	
Small mistakes	1
Big mistakes, unrecognizable, or no attempt	2
Age	
70–85 years	1
Older than 85 years	2
Impaired hearing (patient is not able to hear speech)	1
Impaired vision (< 40%)	1
Problems in activities of daily live	
Domestic help or help with meal preparation	0.5
Help with physical care	0.5
Use of heroin, methadone, or morphine	2
Daily consumption of four or more alcoholic beverages	2
Total score	

Patients with a score of five or more are considered high-risk patients.

Prevention

Treatment strategies are less effective than preventative measures.

Prevention is built on four principles:

- If possible, avoid triggers and worsening factors
- Identify and treat possible causes
- Aim for optimal reactivating care and rehabilitation to avoid further physical/cognitive decline
- Limit and manage dangerous and disturbing behavior and try to control patients to make the other principles possible

Early surgery and proactive geriatric treatment are crucial. The following should be achieved:

- Early volume and electrolyte repletion (if necessary)
- Avoidance of hypoxemia
- Sufficient pain therapy
- Review of medication; look for inadequate/inappropriate medication (tools such as use Beers criteria, PRISCUS List, or START/STOPP criteria)
- Management of bowel and bladder function
- Adequate nutrition
- Early mobilization
- Minimizing the use of physical restraints
- Early detection and treatment of postoperative complications

- Environmental modification and use of nonpharmacological sleeping aids for patients with insomnia
- Orientation protocol and cognitive stimulation for patients with cognitive impairment
- Managing disruptive behavior, particularly agitation and combative behavior
- Monitoring high-risk patients with validated scores, such as the DOS or CAM

In accordance with the current literature, pharmacological prevention using haloperidol, atypical neuroleptics, or rivastigmine cannot be generally recommended. However, there is some evidence that the use of low-dose haloperidol or atypical neuroleptics preoperatively may reduce the duration and severity of delirium.

Treatment

Symptom control is necessary to prevent harm or to allow evaluation and treatment. There are limited data to guide treatment. Delirium is still managed empirically, and there is no evidence in the literature to support a change in current practice.

While there is no large placebo-controlled randomized controlled trial (RCT) that recommend the use of antipsychotics to treat hyperactive delirium, if nonpharmacological measures fail to keep the agitated patient and treating staff safe, the National Institute for Health and Care Excellence (NICE) guidelines state that the prescription of a low dose of any antipsychotic drug for a short period may be considered. A systematic evidence review of the existing data found no superiority for second-generation antipsychotics over haloperidol [3]. A trial of risperidone 0.9 ± 0.6 mg daily versus olanzapine 2.4 ± 1.7 mg daily in 32 subjects showed no improvement in the severity of delirium, although older subjects did not respond as well to risperidone [4]. A pharmaceutical company-sponsored RCT of quetiapine versus placebo in 42 elderly inpatients found that delirium severity improved more rapidly with quetiapine, with a mean dose of 40 mg [5]. No adequately controlled trials could be found to support the use of benzodiazepines in the treatment of non-alcohol withdrawal-related delirium among hospitalized patients, and at this time benzodiazepines cannot be recommended for the control of this condition. However, benzodiazepines are still recommended in some clinical guidelines.

Recommendations:

- In case of any uncertainty, a cerebral CT should be obtained
- Correct any metabolic disturbance where possible
- Improve organ function when possible (renal failure or heart failure)
- Reduce or discontinue medication as soon as possible
- If the patient's safety or the safety of others is endangered by their agitation or if the patient has distressing or psychotic symptoms (eg, hallucinations), medications can be considered:
    - Haloperidol (starting dose 0.5–1 mg: oral, subcutaneous, intramuscular every 6 h)
    - Risperidone (starting dose 0.25–0.5 mg: oral)
    - Quetiapine (starting dose 12.5–25 mg: oral)
    - Olanzapine (starting dose 2.5 mg: oral, 1–2 times a day)

Note that none of the medications above are FDA-approved for delirium. The suggested starting doses are international: ALWAYS CHECK your local protocols and dosages and the specific patient situation.
Treatment is difficult and may have dangerous side effects, therefore, do not hesitate to consult a geriatrician or psychiatric specialist. Evaluate your therapy by reassessing the patient using the CAM, etc.

References

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3. **Campbell N, Boustani MA, Ayub A, et al.** Pharmacological management of delirium in hospitalized adults--a systematic evidence review. *J Gen Intern Med*. 2009 Jul;24(7):848–853.
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5. **Tahir TA, Eeles E, Karapareddy V, et al.** A randomized controlled trial of quetiapine versus placebo in the treatment of delirium. *Psychosom Res*. 2010 Nov;69(5):485–490.

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