THE ABC’S OF DELIRIUM

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Overview

- What is delirium
- Epidemiology
- Pathophysiology
- Risk factors and causes
- Prevention
- Management
History

- Hippocrates (400BC)
  - "In phrenitis ... the hands are waved before the face, hunting through empty space, or tearing chaff from the wall... all such symptoms are bad and deadly."

- Celsus (1AD)
  - "Sick people, sometimes in a febrile paroxysm, lose their judgment and talk incoherently... when the violence of the fit is abated, the judgment presently returns..."
Delirium

- Latin:
  - de: away from/off
  - lira: ridge between ploughed farrows/tracks
  - “off the tracks”

- Acute confusional state
- Acute brain failure
- Metabolic encephalopathy
- Reversible madness
Consequences of delirium

- Length of hospital stay
- Mortality
- Dehydration
- Pneumonia
- Severe distress
- Falls
- Poor nutrition
- Post-traumatic distress disorder
- New institutionalisation
- Readmission rates
- Pressure sores
- Risk of future dementia
## Prevalence

<table>
<thead>
<tr>
<th>Setting</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>General community</td>
<td>1-2</td>
</tr>
<tr>
<td>&gt; 85yo community</td>
<td>14</td>
</tr>
<tr>
<td>ED</td>
<td>10–30</td>
</tr>
<tr>
<td>O/A to hospital</td>
<td>14-24</td>
</tr>
<tr>
<td>During admission</td>
<td>6-56</td>
</tr>
<tr>
<td>Post op</td>
<td>15-53</td>
</tr>
<tr>
<td>ICU</td>
<td>70-87</td>
</tr>
<tr>
<td>Nursing Home</td>
<td>Up to 60</td>
</tr>
<tr>
<td>End of life</td>
<td>Up to 85</td>
</tr>
</tbody>
</table>
Cardinal features

- Disturbance of attention and awareness

- Develops over short period and fluctuates
  - Change from baseline

- Change in cognition or perception not better accounted for by dementia

- Direct physiological consequence of medical condition/substance intoxication or withdrawal
Models of delirium aetiology

- Precipitants of Delirium
  - e.g., infection, trauma, anesthetics, surgery, hypoxia, hypoglycemia, metabolic derangements

- Neuroinflammation
- Oxidative Stress
- Aging
- Neuroendocrine Abnormalities
- Diurnal Sleep/Melatonin Dysregulation

- Network Disconnected
- Neurotransmitter Dysregulation

Maldonado, Am J Ger Psych, 2013
Aetiology

- Direct brain insults

- Indirect mechanisms
  - Aberrant stress response
  - Inflammation
  - Neurotransmitter dysregulation
    - ↓ Ach
    - ↑ Dopamine
Risk Factors

- Dementia/cognitive impairment
- Previous delirium
- ↑ age
- Frailty
- Sensory impairment
- Polypharmacy
- Alcohol, opioid, BDZ use
- Palliative care population
Age

- Aging processes in the brain
- Structural brain disease
- ↓ homeostatic capacity
- ↓ vision and hearing
- ↑ prevalence of chronic disease
  - polypharmacy
- Pharmacokinetic and pharmacodynamic changes
- ↓ resistance to acute disease and stress
In Hospital Risk Factors

- Drugs
- IDC: 2x risk
- Restraints: 4x risk
- Multiple room changes
- ICU admission
- Sensory deprivation
  - Glasses/hearing aids/no natural light
- No clock/watch
Causes: 30% Drugs

- Adverse effects at lower doses
  - ↓ renal excretion/hepatic metabolism
- Analgesics
- Benzodiazepines
- “Anti” drugs
- Withdrawal
  - Narcotics, BDZ, EtOH, SSRIs, TCAs
- Toxicity
  - Digoxin, Li
Causes

- Sepsis
- Vascular event
- Fluid balance (dry/CCF)
- Electrolyte disturbance
- Immobility
  - IDC, restraint
- Malnutrition
- Pain
- Urinary retention/constipation
- 30%: no obvious cause
Assessment

- Collateral history
  - Baseline cognitive function & functional capacity
  - Onset & course of confusion

- Medication history
  - OTC drugs, alcohol, benzodiazepines

- Clinical examination
Features

- Disturbance in attention
- Disorganised thinking
- Disorientation
- Memory impairment
- Perceptual disorders
- Increased or decreased psychomotor activity
- Disturbed sleep/wake cycle
  - Fluctuates, worse at night
4AT

- Alertness
  - ↓: delirium very likely

- AMT4
  - Age, date of birth, place (building), year

- Attention
  - Months of year backwards

- Acute change or fluctuating course
Delirium vs Dementia

- **Onset**
  - Dementia: months to years
  - Delirium: hours/days

- **Fluctuation**
  - Dementia does not fluctuate over minutes to hours

- **Attention**
  - Intact in dementia until late stages
COMPONENTS OF DELIRIUM CARE

- Treat all precipitating causes
- Optimise conditions for the brain
- Communicate with patient & carers
- Prevention
- Detect & treat distress / agitation
- Follow-up / consider dementia
- Prevent complications
- Rehabilitation
### Table. The Most Common Components of Successful Delirium Prevention Programs

- Anesthesia protocols
- Assessment of bowel/bladder functions
- Early mobilization
- Extra nutrition
- Geriatric consultation
- Hydration
- Medication review
- Pain management
- Prevention and treatment of medical complications
- Sleep enhancement
- Staff education
- Supplemental oxygen
- Therapeutic cognitive activities/orientation
- Vision and hearing protocols
Management

- Identify and treat underlying cause
  - If doesn’t resolve
    - Re-evaluate for underlying causes

- Management of the confusion
  - Non pharmacological management
  - Pharmacological management
Non pharmacological management

- Few studies
  - Variable methods
  - Clear trial evidence in favour remains minimal
  - Some show improved patient and carer experience

- Management guidelines mostly expert consensus
Non pharmacological management

- Support and educate the family
- Remain calm & avoid confrontations
- Avoid restraint
- Assist with reorientation
  - Consistency of staff
  - Clocks, calendars
  - Familiar photos and visitors
- Appropriate lighting
- Minimise level of stimulation
Non pharmacological management

- Hearing aids/glasses available and work
- Avoid complications
  - immobility, malnutrition, pressure sores, oversedation, falls, incontinence
- Adequate hydration
- Mobilise
- Sleep hygiene
Pharmacological Management

- Stop what you can
- Reduce doses
- Assess anticholinergic load
- Avoid starting drugs unless clear indication
Anti-psychotics

- Do not treat the underlying delirium
- Do not alter the natural history
- Wandering & disorientation are NOT indications for drug treatment
Anti-psychotics

- Used to
  - Mx patient safely
  - ↓ agitation, aggression, distress
    - Most useful for psychotic sx
  - Facilitate essential investigations or treatment

- Safety and efficacy not established by placebo controlled trials
- Significant SEs
- Lowest dose for shortest time
Anti-psychotics

- No consensus
- Haloperidol: 1st line
  - 0.25mg BD

- Atypicals
  - Limited data. Risperidone best studied
  - RCTs in dementia: ↑ risk of stroke and death

- Increased mortality
  - OR 1.61 (95% CI 0.88 – 2.96)
Anti-psychotics

- Parkinsons/LBD
  - Quetiapine

- ACH inhibitors (donepezil)
  - Insufficient or -ve

- BDZ
  - EtOH/drug withdrawal
  - Probably worsen delirium
Persistent delirium

Cole et al. Age and Aging 2009
Strong RF for new onset dementia

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Delirium (N)</th>
<th>No delirium (N)</th>
<th>OR</th>
<th>P value</th>
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<tbody>
<tr>
<td>Dementia</td>
<td>10</td>
<td>311</td>
<td>8.65</td>
<td>&lt; 0.01</td>
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<tr>
<td></td>
<td>(2.13-35.12)</td>
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<tr>
<td>Dementia worsening</td>
<td>38</td>
<td>226</td>
<td>3.06</td>
<td>&lt; 0.01</td>
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<tr>
<td></td>
<td>(1.49-6.29)</td>
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<tr>
<td>Functional worsening</td>
<td>42</td>
<td>230</td>
<td>2.76</td>
<td>&lt; 0.01</td>
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<tr>
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<td>(1.38-5.52)</td>
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<tr>
<td>Mortality</td>
<td>71</td>
<td>469</td>
<td>1.61</td>
<td>&lt; 0.01</td>
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<tr>
<td></td>
<td>(1.26-2.10)</td>
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* HR
Davis et al Brain 2012
Take home messages

- Common & serious illness
  - Often missed

- Collateral history vital

- ↓ risk with careful attention to risk factors