The Diagnosis, Treatment, and Prevention of Delirium

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Introduction: Agitation and Delirium

- Medical and surgical inpatient floors, as well as intensive care units (ICUs), are filled with agitated and confused patients
  - While such units provide the forum for dramatic, life-saving interventions...
  - They are uniquely stressful
    - high tension
    - danger
    - high technology
    - death
General Principles

- Don’t assume psychiatric symptoms are due to a long-standing psychiatric disorder
- Don’t assume that psychiatric symptoms are a reaction to being in a critical care environment
  - Initiate a search for the underlying cause of the symptoms
  - Identify the symptoms that require treatment
  - Treat symptoms as specifically as possible
Assessment of Mental Status

• Evaluate the ABCs
  – affect
  – behavior
  – cognition
The Mental Status Examination

• Appearance & behavior
  – hypervigilant, frightened, poor eye contact, agitated, psychomotorically retarded

• Speech
  – rambling, rapid, incoherent, fluent

• Mood
  – depressed, fearful, tearful, irritable, anxious, angry, apathetic
The Mental Status Examination

• Affect
  – despondent, anxious, perplexed, blunted

• Thought
  – paranoid, loose associations, hallucinating

• Cognition
  – disoriented, decreased concentration, confused, impaired memory
Screening Tests and Tools for Assessment of Cognition

- Mini-Mental State Examination
  - MMSE
- Montreal Cognitive Assessment
  - MoCA
- Confusion Assessment Method for the ICU
  - CAM-ICU
Agitation

• Excessive, usually non-purposeful motor activity associated with internal tension
• Varies from mild restlessness to combativeness
• Can signify clinical deterioration
• “ICU psychosis” is a misleading term
  – Implies cause & effect between being in the ICU and becoming psychotic
  – Agitation, delirium, and psychosis are not the same
Delirium: Definition

- An organic brain syndrome with a clouded state of consciousness, distractibility, decreased attention, sensory misperceptions, and a fluctuating course
  - “Acute brain failure”
Delirium: Signs & Symptoms

• Clouded consciousness
• Perceptual disturbances
• Incoherent speech
• Disturbed sleep-wake cycle
• Increased or decreased activity
• Disorientation and memory impairment
  – A fluctuating course
  – Related to an organic factor
Delirium: Associated Features

- Anxiety
- Fear
- Irritability
- Depression
- Euphoria
- Apathy
  - These features may steer clinicians to make another diagnosis
Treatment...

• Since treatment is predicated on the diagnosis
  – Identify the etiology as specifically as possible
  – Be sure to rule-out life-threatening causes
Delirium: Life-Threatening Causes

- Wernicke’s encephalopathy; Withdrawal reactions
- Hypoxia; Hypoperfusion of the CNS
- Hypoglycemia
- Hypertensive encephalopathy
- Intracerebral hemorrhage; Infection
- Meningitis/encephalitis; Metabolic
- Poisoning
- Seizures
Delirium: Differential Diagnosis

• Central nervous system
  – Vascular
    • hypertensive encephalopathy, intracranial hemorrhage, vasculitis, stroke
  – Neoplastic
    • space-occupying lesions, paraneoplastic syndrome
  – Seizure
    • post-ictal state, complex partial seizures
Delirium: Differential Diagnosis

- Cardiopulmonary
  - Cardiac arrest
  - Congestive heart failure
  - Respiratory failure
  - Shock
- Infection
  - Meningitis/encephalitis
  - Sepsis
  - Sub-acute bacterial endocarditis
Delirium: Differential Diagnosis

• Endocrine/metabolic
  – Acid-base disturbance
  – Fluid/electrolyte imbalance
  – Diabetic ketoacidosis
  – Hypoglycemia
  – Hepatic failure
  – Renal failure
  – Thyroid dysfunction
Delirium: Differential Diagnosis

- Intoxication/withdrawal
  - Alcohol
  - Anesthetics
  - Anticholinergics
  - Hallucinogens
  - Psychostimulants
  - Narcotics
  - Sedative-hypnotics
Delirium: Differential Diagnosis

• Nutritional deficiency
  – Folic acid
  – Niacin (pellagra)
  – Thiamine (Wernicke’s, Korsakoff’s)
  – Vitamin $B_{12}$ (pernicious anemia)

• Poisons
  – Carbon monoxide
  – Heavy metals (lead, mercury)
  – Toxins
Common Delirium-Inducing Drugs

• Antiarrhythmics
  – Lidocaine, mexiletine, procainamide, quinidine

• Antibiotics
  – Penicillin, rifampin

• Anticholinergics
  – Atropine
Common Delirium-Inducing Drugs

• Antihistamines
  – Non-selective: diphenhydramine, promethazine
  – $H_2$ blockers: cimetidine, ranitidine

• Beta-blockers
  – Propranolol

• Narcotics
  – Meperidine, pentazocine
Treatment of Agitation

• Correct metabolic and systemic abnormalities
• Eliminate drug toxicity
• Remove the offending agent(s)
• Administer appropriate antidote(s)
  – e.g., Physostigmine, naloxone, flumazenil
Treat Drug Withdrawal

• Obstacles to prompt treatment
  – Emergent admissions may result in sudden discontinuation of abused drugs
  – History of use may be difficult to establish in intubated or unconscious patients
  – Physical signs of withdrawal are non-specific
  – No laboratory tests can confirm the diagnosis
Alcohol & Sedative-Hypnotics

• Alcohol withdrawal
  – Benzodiazepines, phenobarbital, neuroleptics

• Sedative-hypnotic withdrawal
  – Symptom-onset a function of half-life; the longer the half-life the longer the latency
  – Symptom frequency and intensity greatest with half-life of 10-20 hours
  – Treatment best with a longer half-life agent
Narcotic Withdrawal

• Syndrome generally mild
  – Discomfort; delirium uncommon
  – Treatment involves replacement with a longer half-life agent of the same class
  – Clonidine is effective in reducing symptoms
Haloperidol

- A high-potency agent
- Trivial effects on heart rate, blood pressure, respiratory drive
- Often used IV despite lack of FDA approval for IV use
- Used IV it precipitates with phenytoin and heparin;
  - Flush the IV line first
- Dose used depends on symptom severity
Haloperidol

• Onset of action: 10-30 minutes
• Hypotension, if it occurs, is associated with hypovolemia
• High-dose use associated with QTc prolongation and Torsades de Pointes
• Extrapyramidal side effects are rare with IV use
Haloperidol

- Titrate the dose to the symptoms
  - If mild, use 0.5-2 mg
  - If moderate, use 5-10 mg
  - If severe, use 10 mg or more
- Repeat doses when necessary, every 15-30 minutes
- Adjust dose to clinical course
Other Neuroleptics

• Droperidol
  – More sedating than haloperidol
  – Lowers blood pressure more than haloperidol

• Chlorpromazine
  – More anticholinergic, more apt to induce hypotension, and more likely to induce arrhythmias than haloperidol
Atypical Antipsychotics

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Alternative Agents for Agitation...

- Dexmedetomidine
  - Highly selective alpha-2 adrenoreceptor agonist with sedative and analgesic properties
- Valproate
  - Especially when irritability or impulsivity present
- Propofol
Alternative Agents for Agitation

• Narcotics
  – Morphine typically used

• Paralytics
  – If used, sedation still required

• Benzodiazepines
  – Lorazepam
    • used PO, SL, IV; has no active metabolites
  – Midazolam
    • rapidly-acting; causes amnesia and respiratory depression
Benzodiazepines...

- **Midazolam**
  - half-life, 1-12 hrs; 2 mg; fast

- **Oxazepam**
  - half-life, 5-15 hrs; 15 mg; slow

- **Lorazepam**
  - half-life, 10-20 hrs; 1 mg; intermediate

- **Alprazolam**
  - half-life, 12-15 hrs; 0.5 mg; intermediate-fast
Benzodiazepines...

- **Chlordiazepoxide**
  - half-life, 5-30 hrs; 10 mg; intermediate
- **Clonazepam**
  - half-life, 15-50 hrs; 0.25 mg; intermediate
- **Diazepam**
  - half-life, 20-100 hrs; 5 mg; fast
- **Flurazepam**
  - half-life, 40 hrs; 5 mg; fast
- **Clorazepate**
  - half-life, 30-200 hrs; 7.5 mg; fast
Benzodiazepines

• Diazepam
  – IV: onset, 2-5 min; starting dose, 2-5 mg
  – PO: onset, 10-60 min; starting dose, 2-5 mg

• Lorazepam
  – IV/IM: onset, 2-20 min; starting dose, 1-2 mg
  – SL: onset, 2-20 min; starting dose, 0.5-1 mg
  – PO: onset, 2-60 min; starting dose 0.5-1 mg
Non-Pharmacological Treatment

• Re-orientation
• Adjustment of physical environment
• Reassurance
  – Determine why are the patient is anxious to guide interventions
  – Clarify misconceptions
  – Remain calm
Prevention of Delirium

• Minimize risk factors for delirium
• Monitor lab values and vital signs
  – e.g., Oxygenation, hematocrit, blood pressure, drug levels
• Administer antipsychotics prophylactically
  – Administration of olanzapine reduced incidence of post-operative delirium from 41% to 15% in elderly joint replacement patients
Conclusion

• Medically-oriented psychiatric consultants can help evaluate and manage critically ill patients as well as prevent psychiatric and neuropsychiatric symptoms
  – Psychopharmacologic skills
  – Psychotherapeutic skills
  – Medical knowledge
Selected References...

Selected References...

Thank You...

• Questions?