Delirium & Dementia

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Outline

• Delirium vs. Dementia
• Neural pathways relating to consciousness
• Encephalopathy
• “Stupor”
• Coma
• Dementia
Delirium vs. Dementia

• Delirium
  – Abrupt onset
  – Lasts hours-days
  – Reduced attention
  – Fluctuating consciousness
  – Speech disorganized
  – Usually reversible

• Dementia
  – Insidious onset
  – Lasts months-years
  – Normal attention
  – Consciousness intact
  – Speech largely intact
  – Usually irreversible
Underlying Pathways
Encephalopathy

• The inability to maintain a coherent stream of thought or action
• Inattentive
• Easily distractible
Causes of Encephalopathy

- Toxic-Metabolic
- Infectious
- Vascular (e.g. hypertensive encephalopathy)
- Traumatic (e.g. concussion, hemorrhage)
- Epileptic (e.g. post-ictal state)
Metabolic Encephalopathy

- Drugs (EtOH, sedatives, narcotics)
- Endocrine (hypo- or hyper- thyroid, glycemia)
- Electrolyte (hypernatremia, hypercalcemia)
- Nutritional (B1 or B12 deficiency)
- Organ system failure (renal, hepatic)
Infectious Encephalopathy

• Encephalitis vs. meningitis
• Important to consider if fever present
• Quick institution of therapy necessary
• Low threshold for LP
Stupor, Obtundation, and Other Bad Words
Coma

- Patient is unconscious
- No purposeful response to the environment
  - Spontaneous, to command, to noxious stimuli
- Cannot be aroused
- Eyes closed
Etiology of Coma

• Medical
  – Diffuse hypoxia/ischemia
  – Dysglycemia
  – Organ failure or dysfunction
  – Intoxications
  – Severe electrolyte imbalances
  – CNS infections

• Surgical
  – Intracranial hemorrhage
  – Intracerebral masses
  – Large strokes
  – Traumatic brain injury
Brain Death

• Irreversible cessation of all brain function
• Synonymous with death in NYS
• Cause of coma must be known
• Other confounders must be ruled-out
  – e.g. drug intoxication, hypothermia, etc.
Examination in Coma

• Assess for arousal
• Examine eyes
  – Pupillary response, corneal response, oculocephalic response
• Evaluate for gag reflex
• Evaluate for response to noxious stimuli
• Evaluate motor response to noxious stimuli
Dementia

• Progressive disorder of cognitive function involving memory and at least one other cognitive domain
Causes of Dementia

- Alzheimer’s disease
- Frontotemporal dementia
- Lewy Body dementia
- Vascular dementia
- Other causes
Alzheimer’s Disease

- Most common cause of dementia
- Prevalence increases with age
- Usually sporadic (95% of cases)
Pathogenesis

- β-amyloid- forms neuritic plaques- extracellular deposits
- Neurofibrillary tangles- intracellular deposits containing hyperphosphorylated τ protein and ubiquitin
- Cholinergic deficiency
  - Degeneration of nucleus basalis of Meynert and septal-hippocampal tract
Pathology
MRI in Alzheimer’s Disease
Clinical Manifestations

• Early
  – Recent memory difficulty
  – Anomia (word-finding difficulty)
  – Visuospatial dysfunction

• Late
  – Disinhibition
  – Psychiatric manifestations
  – Eventually akinetic mutism
Treatment

• Acetylcholinesterase inhibitors
  – Donepezil, rivastigmine, galantamine

• NMDA-glutamate receptor antagonist
  – Memantine

• Symptomatic treatment
  – For psychosis, depression, etc.

• Supportive care
Frontotemporal Dementia

- Earlier onset than Alzheimer’s
- More prominent behavioral than cognitive dysfunction at onset
- Preferential atrophy of frontal and anterior temporal lobes
- Due to abnormal accumulation of $\tau$ protein
- No treatment
Frontotemporal Dementia
Lewy Body Dementia

• Second most common cause of dementia
• Caused by presence of Lewy bodies throughout the cortex made up of α-synuclein
Clinical Features

• Dementia
  – Memory less prominently involved than Alzheimer

• Parkinsonism
  – Tremor, bradykinesia, rigidity, gait dysfunction

• Fluctuation of cognition

• Visual hallucinations
Vascular Dementia

• Third most common cause of dementia
• Relationship between cerebrovascular disease and dementia is poorly characterized
• Pathogenesis
  – 1. Multiple strategic infarcts
  – 2. Confluent white matter disease
  – 3. Both
Vascular Dementia
Vascular Dementia

• “Step-wise progression”
• Treatment is supportive
  – Largely aimed at treating modifiable vascular risk factors (blood pressure, lipids, diabetes)
Other Causes of Dementia

• Potentially reversible causes
  – Hyper- or hypothyroidism
  – normal pressure hydrocephalus
  – B12 deficiency
  – neurosyphilis

• Associated with other disease
  – Parkinson’s disease
  – AIDS
Neurological Manifestations of HIV

• Seen in up to 70% of patients with HIV/AIDS
• Two major pathophysiologic mechanisms:
  – Direct effects of HIV on nervous system
  – Opportunistic infections
Neuro-cognitive Symptoms

• Subcortical dementia
• Difficulties with attention and concentration
• Slow processing speed
• Mild short term memory dysfunction
• Decline in psychomotor function
  – Fine hand movements, gait incoordination
MRI Findings
AIDS Dementia Complex

• a.k.a. HIV encephalopathy
• Occurs later in disease course
• More severe cognitive and behavioral deficits
• Can see widespread white matter disease and atrophy on MRI
Questions?