Delerium and Dementia

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Disclosures

- Sadly, I still have nothing new to disclose since early my last presentation
- Using the ARS for this talk
- References include answer key and link to UCSF Memory and Aging web site: https://memory.ucsf.edu
- MOCA test reproduced at end of slides

Mental Status Assessment

- If the patient can give a completely coherent history, then the mental status examination is probably normal
- If history suggests a cognitive problem, then a methodical mental status exam is necessary

Screening Mental Status

- Attention-Digit span forward first (nl-6-7)
- Orientation-time, place, person
- Language-repetition, naming, comprehend
- Recent memory-Recall of 3 common objects at 5 minutes; if misses an answer give a prompt
- Abstractions-Similarities and differences (e.g.- apple vs. orange; lake vs. river)
Q1: Which abnormal mental status exam finding negates the value of testing for recent memory?

1) Abstractions
2) Attention span
3) Orientation
4) Visual fields

Screen Attention First

- Attention-requires input of numbers, immediate recall, and verbal output of numbers
  - Everyone must remember a numerical sequence
  - Exceptions: deafness, ESL, no education
- Memory-input of objects, hold memory of objects for five minutes, then verbal recall

Delerium-Defining Features

- Poor attention-Digit span forward < 6-7
- Acute or subacute onset
- Other cognitive abnl (e.g.-disorientation)
- Not explained by another neurologic dz
- Evidence that the delirium is caused by a “metabolic” disorder

Pathological Basis of Delerium: Impaired Attention

- Inattention-malfunction cerebrum/brainstem
- Arousal and attention centers in brainstem RAS (Reticular Activating System)
- Bilateral cerebral regions that receive sensory inputs, process and interpret information, react to inputs, and result in expressive or motor outputs in response
Delerium-Practical Clinical Features

• History provided by family, friends, or co-workers who know the patient well
  – Establish pre-morbid mental baseline
  – Review medications and “substances”
  – Review medical comorbidities
• Initial test of choice if often to call or interview someone who knows history

Delerium-Clinical Accompaniments

• Fluctuation over minutes-hours-lethargy or hyperactivity based on many observations
• Vital signs
  – Tachycardia/hypersympathetic state-infection, substance use, substance withdrawal
  – New hypertension/hypotension
  – Fever-risk of infection
• Meningismus-Resistance to neck flexion
• Exam features above normal in dementia

Q2: Which neuro exam finding helps distinguish delerium from dementia?

1) Fine, postural tremor
2) Asterixis
3) Myoclonus
4) New focal neurologic findings (e.g.-hemiparesis)
5) All of the above

Neurologic exam findings that help distinguish delerium from dementia

• Fine postural tremor-Acute/subacute onset-often sign of hypersympathetic state
• Asterixis-Loss of tone with hand extension
  – Classic with renal or hepatic failure
  – Seen in many metabolic conditions
• Myoclonus-sudden discharge of motor cells producing an asymmetric jerk-metabolic
Delerium-Metabolic Causes/Evaluation-I

**Metabolic Causes**
- Hypo/hypernatremia
- Renal failure
- Hypoxia, ischemia
- Hypo/hyperglycemia
- Hypo/hyperthyroidism,

**Laboratory Studies**
- Na
- BUN, Cr
- PO2
- Glucose
- Thyroid function tests

Delerium-Metab Causes/Evaluation-II

**Metabolic Causes**
- Substance use/withdrawal
- Alcohol intox/withdrawal
- Medication overuse/withdrawal
- Hypercalcemia, Hyper Mg
- Hyperphosphatemia
- Hepatic Failure

**Laboratory Studies**
- Toxicology screen
- Alcohol level
- Review meds; consider drug level
- Calcium, magnesium
- Phosphate
- LFTs; ammonia

Delerium – Common Causes and Evaluation

**Infectious Causes**
- Sepsis
- Meningitis

**Laboratory Studies**
- Cultures, CBC, Chest X-Ray, UA
- Lumbar puncture (LP), Cultures, CBC, CXR, UA

**Neurologic Causes**
- Subarachnoid hemorrhage
- Cerebral infarction
- Seizures, post-ictal state

**Laboratory Studies**
- Head CT, LP
- Head CT or MRI
- Consider head CT/MRI, EEG

Pitfalls in the Outpatient Assessment of Delerium

- The delerium is a **post-ictal state** and the intermittent seizures are not obvious
  - Get more history from observers re poss sz
  - Patient has pre-existing brain dz (e.g.-stroke)
- The patient is **malnourished and has thiamine deficiency** (e.g.-Wernicke’s)
- Neuro exam in uncooperative patient?
Neuro Exam for Focality in the Delirium (Uncooperative) Patient

• Cranial Nerve Examination
  - Facial asymmetry on command or with grimace
    - Lower 2/3 face-upper motor neuron
  - Entire face-facial nerve or brainstem

• Brainstem reflexes
  - Pupils-midbrain: asymmetric, reactive?
  - Corneals-pons: asymmetric, reactive?
  - Breathing/pulse-medulla: normal/abnormal

More Pitfalls in the Outpatient Assessment of Delerium

• Delerium dx as depression in setting of somnolence or reduced responsiveness
  – Use vitals, gen exam, neurologic signs as above
  – EEG nl depression, diffusely slow in delerium
• An undiagnosed neurodegenerative disease is already present (e.g., AD)
  – Slower recovery from delerium/post-ictal state
  – Establish baseline mental function

Q3: What is Not Routinely Useful in Managing Improving Delerium after Hospital Discharge

1) Use of anti-psychotic to control behavior
2) Use of prescribed eyewear
3) Use of prescribed hearing aids
4) Frequent reorientation of the patient in a familiar environment
5) Encourage the patient to fall asleep on a schedule
Non-Pharmacologic Prevention and Management of Delirium

- Especially at hospital discharge to home
- Frequent, calm reorientation of the patient
- Using eyeglasses and hearing aids
- Early PT/mobiliz-restore baseline function
- Sleep hygiene
  - Prevent daytime naps
  - Encourage falling asleep on a schedule

Delerium-Conclusions I

- If the patient can give a completely coherent history, then the mental status examination is almost always normal
- Initial assessment of suspected delirium:
  - Establish pre-morbid mental baseline
  - Rev medication or substance use and disuse
  - Review medical comorbidities
  - Assoc exam signs-fever, inc HR, tremor, stiff neck, myoclonus, asterixis

Delerium-Conclusions II

- Screen attention first
- Have your list of screening labs for delirium at the ready
- Beware of outpt traps-baseline depression, neurodegen dz, post-ictal state, thiamine def
- Non-pharmacologic measures are proven to enhance mental functioning in delirium pts
Dementia

- Dementia—a decline in cognition interfering with daily function and independence
  - No disturbance of consciousness
  - Best assessed as an outpatient
- Impairment in at least one cognitive domain:
  - Memory and learning
  - Language
  - Executive function—judgment, planning, reasoning
  - Social cognition, perceptual-motor function

Goals of Dementia Assessment

- Establish the presence/absence of dementia
- Understand areas of cognitive impairment and the severity of the impairment
- Understand the functional consequences of areas of cognitive impairment/preservation
- Determine the likely etiology

Approach to Patient/Family: Visit One

- Best history from pt and family or sig other
- General/neuro exams and limited lab testing
- May need separate input from others if patient is defensive or argumentative
- Patients often lack insight into the problem
  - Denial or excuses—remembering something is not important anymore or too old for an activity
  - Social and interpersonal skills preserved early

Q4: Which one of the following is important in a dementia history?

1) Recent memory function
2) Executive function
3) Language
4) Assessing impact of cognition on safety risks
5) All of the above
### Dementia History-Memory

- **Age-Associated Memory Challenges**
  - Forgetting words or names
  - Slowing of cognitive processing
  - Increased difficulty with multitasking
- **Worrisome Memory Deficits**
  - Forgetting recent conversations
  - Forgetting appointments and plans
  - Not paying bills on time

### Dementia History-Language

- **Expressive aphasia** - Reduced volume of language but perservation of content words
- **Paraphasic errors** - Substituting one word for another that sounds similar but has a different meaning (e.g., cow for car)
- **Neologisms** - Word sounds that are not words
- **Receptive aphasia** - Word salad, nonsensical words, paraphasic errors, neologisms

### Dementia History-Executive Function

- Performing complex tasks
- Initiating plans
- Following multistep directions - using a remote control or computer
- Visuospatial deficits - difficulty using hands for a complex task or misjudging the position of objects in space

### Dementia History-Functional Assessment

- Basic ADLs preserved until late - bathing, eating, dressing, grooming, continence
- Safety risks - driving, climbing stairs, falling or near falls, car accidents, getting lost in familiar surroundings
- Food preparation, household maintenance
- Keeping appointments, managing finances
Dementia - Role of Comorbidities
+ Physical/Psychosocial factors?

• Special senses - Diminished hearing or vision
• Conditions limiting mobility - balance (medications, alcohol), CHF, hip arthritis,
  Physical obstacles
  – Steps into house or stairs in home?
  – Is the home filled with debris or tidy?
• Psychological state - home alone; social function; help with challenging home tasks

Screening Mental Status

• Attention - Digit span forward (nl > 6-7)
• Orientation - time, place, person
• Language (aphasia testing) - repetition, naming, comprehension
• Memory - Recall of 3 common objects at 5 minutes; if misses an answer give a prompt
• Abstractions - Similarities and differences (e.g. apple vs. orange; lake vs. river)

Cognitive Testing - the MoCA

• 30 point test - takes 10 minutes to administer
• Normal score > 25; adjust education level
• Improvement detecting MCI (mild cognitive impairment) or AD from MMSE
• Assesses memory, executive function, language, visuospatial ability
• When abnl may suggest AD but other structural neurologic dz must be considered
• www.mocatest.org electronic copy of test

Mild Cognitive Impairment (MCI)

• Cognitive limitations severe enough to be noticed by patient or others
  – Not interfering with ADLs
  – Higher risk of develop AD; road to biomarker?
  – Most often recent memory, oce exec function
  – Some pts never get worse or improve
  – Settle advanced directives
• MOCA scores less than 26 are sensitive and specific for AD and MCI
Dementia-Cranial Nerve Exam

- Cranial nerve palsy unexpected in dementia
  - Diplopia/impaired eye movts (CN III, IV, or VI)-brainstem
  - Weakness lower 2/3 face (CNS) or entire face (CN VII palsy or brainstem)
  - Difficulty swallowing, aspiration, voice (CN X)
  - Abnormal brainstem reflexes (pupils, corneals)
  - Any other CN palsy-much less common

Dementia-Motor/Sensory Exam

- Rigidity or cogwheeling tone-Parkinsonism
- Spasticity/UMN weakness-Descending motor tracts (stroke, brain tumor, MS)
- Diffuse LMN Weakness-motor neuron dz
- Unilateral ataxia limb-cerebellum
- Gait ataxia-cerebellum, sensory loss, severe focal weakness, severely reduced vision
- Unilat sensory loss-ascending sensory tracts

Dementia-Lab Assessment

- B12, TSH, BUN, Cr, CBC
- Consider RPR, HIV, methylmalonic acid
- Brain MRI-subdural hematoma, strokes, white matter disease, microhemorrhages
- Amyloid PET imaging-amyloid lesion burden and distribution in brain
  - No routine clinical use-diagnosis of AD vs. other dementias, prognosis, research biomarker

Q5: Which statement regarding Alzheimer’s disease (AD) is false?

1) Most common form of dementia
2) Prevalence is constant in the population after age 70
3) Uncommon before age 60
4) Impaired recent memory is the most common deficit at presentation
AD-Epidemiology

- Genetic forms are uncommon, except in patients with early age of onset
- Prevalence increases with age-up to 40% of patients over the age of 90 years have AD
- “The Silent, Slow Epidemic”- As life expectancy continues to increase the incidence of AD will skyrocket, especially in developing countries
- Quality of life decried by family members

Mild-Mod AD-Donepezil Rx

- Depletion of cortical choline acetyl transferase leads to decreased acetylcholine and impaired cholinergic function
  - Donepezil (rivastigmine, galantamine)
  - Donepezil 5 mg po/day x 4 weeks, then 10 po
  - Small benefit MMSE scores
  - Contraind-heart block, SSS, bradycardia
  - Diarrhea, nausea, emesis transient in 20%
  - Effect washes out when drug discontinued

Mod-Sev AD-Memantine Rx

- Memantine-NMDA receptor antagonist
  - Poss Neuroprotective-Blocks pathologic stimulation NMDA receptors (vasc dem, AD)
  - Trials show reduced rates of deterioration on clinical efficacy scales and possibly useful as add-on to donepezil in moderate to severe AD
  - Infreq side effects-HA, dizziness, confusion
  - 5 mg/day x 1 week, then increase by 5 mg/wk until taking 10 mg bid

AD-Other Drug Rx

- Vitamin E-2000 U/day-mixed results
- Patients and families will ask you about what they read on the internet
- No role for selegiline, estrogen replacement, antiinflammatory drugs, ginkgo biloba, statins, vitamin B, omega-3 fatty acids
## Dementia Management Issues

- **Nutrition** - Malnutrition common; oral supplements may be useful
- **Exercise** - Slows functional decline
  - No clear effect on cognitive decline
  - Less depression
- **Occup Rx** - Individual sessions training pts/caregivers on coping strategies and use of aids improved function at 3 months

## Dementia-Quality of Life and Survival

- Mean survival if dx at age 65 is 9 years
- Mean survival if dx at age 90 is 3 years
- Prognostication affects eligibility for hospice Medicare benefit—only estimated survival of < 6 months are eligible
- Palliative care access should not be guided by prognosis but dz trajectory and family/pt wishes for comfort and quality of life

## Dementia-Other Considerations

- Control risk factors for cardiovascular disease and stroke
- Try to manage disruptive behaviors without anti-psychotics
- Attend to family caregivers—how are they avoiding burnout?
- Elephant in the Room—Outpatient Palliative Care for Patients with Dementia

## Dementia and Sleep Disturbance

- Insomnia and irregular sleep-wake rhythm
- Restless legs syndrome
- Periodic limb movements of sleep
- REM sleep disorder—acting out dreams
- Obstructive sleep apnea
- Excessive daytime somnolence
- Refer sleep center consultation/sleep study
Approach to Patient/Family: Visit Two

- Discuss test results and what they mean
- Describe working dx + etiology (if known)
- Encourage activities patient still enjoys
- Discuss management
  - ADLs including driving, finances, safety risks
  - Drug and non-drug management strategies
  - Community and social resources
  - Quality of life and advanced directives
  - “Family care ecosystem” in devel at UCSF

Dementia Conclusions-I

- Dementia is a decline in cognition interfering with daily function and independence
- The most common domains of impairment are recent memory, language, and executive function
- Gen/neurologic exams establish presence or absence of other medical/neurologic contributions to altered mental status

Dementia Conclusions-II

- Approved drug treatments for Alzheimer’s disease are of modest benefit
- Personalize care by addressing safety risks, management of ADLs, minimizing treatable medical problems (e.g.-hearing loss, CHF)
- Address quality of life issues with the patient and caregivers (advanced directives and continue activities that give pleasure)