

# Delirium

Gail Greendale, MD  
Brandon Koretz, MD

## DEFINITIONS

- DSM IV:
  - ▶ Disturbance of consciousness (reduced clarity of awareness) with reduced ability to focus, sustain, or shift attention
  - ▶ Change in cognition (memory, disorientation, language) or the development of a perceptual disturbance not better accounted for by pre-existing dementia
  - ▶ Disturbance develops over short time period and tends to fluctuate over course of day
  - ▶ Evidence from history, physical exam, or lab that the cognitive disturbance is caused by direct physiologic consequences of a medical condition, substance, medication use, or multiple etiologies
- CAM—confusion assessment method
  - ▶ Diagnostic algorithm has four components:
    - 1) Acute onset and fluctuating course
    - 2) Inattention
    - 3) Disorganized thinking
    - 4) Altered level of consciousness
  - ▶ To diagnose delirium, need 1 and 2 and either 3 or 4
  - ▶ Positive Predictive Value: 90%
  - ▶ Negative Predictive Value: 90-100%

## EPIDEMIOLOGY

- 14-24% prevalence at time of hospital admission
- 6-56% incidence (new cases) during admission
- 63% of patients had no signs of delirium at 3 month follow-up
- 68% of patients had no signs of delirium at 6 month follow-up

## RISK FACTORS\*

Risk Factor	Unadjusted Odds Ratio
Pre-existing dementia	5.2
Severe medical illness	3.8
Alcohol abuse	3.3
Diminished ADL	2.5
Abnormal serum sodium	2.2
Male gender	1.9
Depression	1.9
Hearing impairment	1.9
Visual impairment	1.7

Advance age and and increased BUN/Cr ratio were also significant risk factors but lack of common definitions for these risk factors precluded calculating precise odds ratios of risk.

\* Based on Elie, 1998 meta-analysis of 27 studies published 1966-1995. All are  $p < .05$ .

Single studies have found other risk factors (e.g., narcotics, especially demerol) to be significant.

## EVALUATION

- Drugs (not an exhaustive drug list; major and common offenders only)
  - Benzodiazepines
  - Alcohol
  - CNS depressants or stimulants
  - Digoxin
  - Cimetidine (or other H2 blockers)
  - Central anti-hypertensives
  - Anticholinergics:
    - Anti-histamines
    - Anti-Parkinsons drugs
    - Tricyclic antidepressants
    - Muscle or bladder relaxants
- Diseases
  - Cardiac, pulmonary, hematologic-oncologic, renal, hepatic, metabolic, Endocrinologic, Infectious
- Environmental
  - Sleep deprivation, pain, post-op, unfamiliar surroundings
- Other considerations
  - Neurologic
    - Mass, trauma, vascular, CNS infections, seizure/post-ictal state
  - Withdrawal
    - Drug, alcohol
  - Industrial exposures
  - Psychiatric illness

## PREVENTION

- Multicomponent intervention prevented delirium in hospitalized patients
  - ▶ n=852, age >69, used prospective matching strategy (i.e. NOT randomized; each control patients selected for similar characteristics to each treatment pt—the two are matched)
  - ▶ delirium developed in 9.9% of intervention group versus 15.0% of usual care (matched odds ratio .60 [.39-.92])
  - ▶ severity of delirium and recurrence rates were equal

Risk Factor	Intervention
Cognitive Impairment	Orientation Protocol: board with names and daily schedule and reorienting communication Therapeutic-activities: stimulating activities TID
Sleep deprivation	Non-pharmacologic: warm milk/herbal tea, music, massage Noise reduction: schedule adjustments and unit-wide noise reduction
Immobility	Early-mobilization: ambulation or ROM TID, minimal immobilizing equipment
Visual Impairment	Visual aids and adaptive equipment
Hearing Impairment	Amplification, cerumen disimpaction, special communication techniques
Dehydration	Early recognition and volume repletion

## TREATMENT

- Non-pharmacologic: as above, involve family members
- Pharmacologic—**be careful**—you are adding CNS active agents to a person who is already confused!!
  - ▶ Trials conducted in dementia patients with agitation—data are frequently assumed to apply to delirium although this may not necessarily be appropriate
  - ▶ Neuroleptics
    - Haldol—Randomized trial supporting standard dose (2-3mg/d) versus low dose (.75-.5 mg/d) and placebo
    - Risperidone—Randomized trial supporting 1-2 mg/d versus placebo but more side effects at 2 mg/d
    - case reports for olanzapine for patients with delirium
  - ▶ Benzodiazepines
    - treatment of choice in benzodiazepine and alcohol withdrawal.
    - Watch for paradoxical response
    - Ativan .25 or .5 mg q 6 prn as initial dose
  - ▶ Case reports support acetylcholinesterase inhibitors for delirium but no randomized trial data

## REFERENCES:

- Brecher M. Risperidone in the treatment of psychosis and aggressive behavior in patients with dementia. Abstract only.
- Devanand DP, Marder K, Michaels KS, et al. A randomized, placebo controlled dose-comparison trial of haloperidol for psychosis and disruptive behaviors in alzheimer's disease. *Am J Psychiatry* 1998; 155: 1512-1520.
- Elle M, Cole MG, Primeau FJ, et al. Delirium risk factors in elderly hospitalized patients. *J Gen Internal Medicine* 1998; 13: 204-12.
- Inouye SK, Bogardus ST, Charpentier PA, et al. A multicomponent intervention to prevent delirium in hospitalized older patients. *NEJM* 1999; 340: 669-76.
- Inouye SK. Delirium in hospitalized older patients. *Clinics in Geriatric Medicine* 1998; 14: 745-764.
- Levkoff SE, Evans DA, Liptzin B, et al. Delirium the occurrence and persistence of symptoms among elderly hospitalized patients. *Arch Intern Med* 1992; 152: 334-340.