Common Medical Issues and Management in the Geriatric Trauma Patient

2018 UW Medicine EMS & Trauma Conference
September 17, 2018

Joe C. Huang, M.D.
Clinical Instructor
Medical Director, Geriatric Palliative Care-Surgery Management
Univ. of Washington Department of Medicine
Division of Gerontology & Geriatric Medicine

Disclosures

• I have no financial disclosures

Objectives

• Understand approach to delirium and frailty in geriatric trauma patients
• Discuss medical management of delirium and frailty in geriatric trauma patients
Background

- Older adults are the fastest growing demographic of the population
- Are at increased risk of death or disability compared to younger adults with similar disease or injury severity
- Are at increased risk of complications and functional decline after trauma

Normal aging and role in disease

- Predictable, progressive changes and decline in organ and immune function
- Leads to reduced physiologic reserve
- Increases susceptibility to disease and injury
- Multiple factors (genetic, environment, nutrition) influence rate of aging

Common Medical Issues in Geriatric Trauma patients

- Delirium
- Frailty
**Delirium**

- Acute change in attention and cognition, or “acute brain failure”
- Affects up to 50% of hospitalized older adults and up to 80% in ICUs
- Presents as hypoactive, hyperactive or mixed states
- Serious and life-threatening disorder

*Inouye SK et al. Delirium in elderly people. *Lancet* 2014*

**Diagnosis of Delirium: Confusional Assessment Method (CAM)**

1. Acute Onset & Fluctuating Course  
2. Inattention  
   - plus either  
   - 3. Disorganized Thinking  
   - 4. Altered LOC  

*Delirium*  

*Inouye SK et al. Ann Intern Med 1990*

**CAM-S: Grading Severity of Delirium**

*Inouye SK et al. Ann Intern Med 2014*
CAM-S Score assoc. with important clinical outcomes

<table>
<thead>
<tr>
<th>Factor</th>
<th>CAM-S Score</th>
<th>Important Clinical Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older age</td>
<td>2</td>
<td>Decreased mortality rate</td>
</tr>
<tr>
<td>Dementia</td>
<td>3</td>
<td>Increased risk of delirium</td>
</tr>
<tr>
<td>History of prior delirium</td>
<td>4</td>
<td>Higher likelihood of neurocognitive impairment</td>
</tr>
<tr>
<td>History of TIA or stroke</td>
<td>5</td>
<td>Severe complications</td>
</tr>
<tr>
<td>History of depression</td>
<td>6</td>
<td>Lower cognitive function</td>
</tr>
<tr>
<td>History of alcohol use disorder</td>
<td>7</td>
<td>Increased risk of falls</td>
</tr>
<tr>
<td>Co-morbidity and serious illness</td>
<td>8</td>
<td>Increased risk of hospitalization</td>
</tr>
<tr>
<td>Sensory deprivation</td>
<td>9</td>
<td>Increased risk of delirium</td>
</tr>
</tbody>
</table>

Dielirium: Interplay of predisposing and precipitating factors with vulnerability

Predisposing factors or vulnerability
- Older age
- Dementia
- History of prior delirium
- History of TIA or stroke
- History of depression
- History of alcohol use disorder
- Co-morbidity and serious illness
- Sensory deprivation

Precipitating factors or insults
- High vulnerability
- Low vulnerability
- Nervous insult
- Non-nervous insult
Precipitating Risk Factors for Developing Delirium

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>RR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical restraints</td>
<td>4.4 (2.5-7.9)</td>
</tr>
<tr>
<td>Malnutrition</td>
<td>4.0 (2.2-7.4)</td>
</tr>
<tr>
<td>≥3 new meds</td>
<td>2.9 (1.2-4.7)</td>
</tr>
<tr>
<td>Foley catheter</td>
<td>2.4 (1.2-4.7)</td>
</tr>
</tbody>
</table>

Inyoue SK, Charpentier P A. JAMA 1996

Additional Precipitating Factors for Delirium

- Substance intoxication or withdrawal
- Exposure to certain medications (AGS Beer’s List)
- Physiologic or iatrogenic insults
- Untreated/sub-optimally treated pain
- Constipation and/or urinary retention

Medications to avoid in patients at high risk for delirium

- Antihistamines (Benadryl, Hydroxyzine, Loratadine)
- Anticholinergics (Many psychotropics, bladder antispasmodics)
- Benzodiazepines (Ativan, Clonazepam, Temazepam)
- Sedatives/hypnotics (Ambien, Lunesta, Sonata)
Medications to avoid in patients at high risk for delirium

- Muscle relaxants (Flexeril, Robaxin)
- Certain opioid analgesics (Demerol, Fentanyl)
- Certain antibiotics (Quinolones, Aminoglycosides)
- Certain anti-emetics (Scopolamine, Compazine)

Patient factors

- Sleep deprivation
- Sensory deprivation
- Lack of mobility
- Absence of family
- Absence of aids to orientation

Physiologic factors

- Hypoxia, hypercapnia
- Hypovolemia and dehydration
- Electrolyte abnormalities
- Hypo- or hyperglycemia
- Metabolic derangements
- Infection, sepsis
- Trauma, surgery
- Multi-organ dysfunction/failure
Management of Delirium

• Identify patient’s at risk for delirium
• Assess and document presence or absence of delirium and if present, severity of delirium
• Institute non-pharmacologic multi-targeted, multi-disciplinary prevention strategy
• Maintain patient safety

Management of delirium

• Identification and treatment of reversible medical problems
• Avoid potentially inappropriate medications
• Early and frequent mobilization, range of motion
• Maintain adequate hydration and nutrition

Prevention for Delirium: HELP

• Reduction of development of delirium
  – 9.9% vs. 15% (P = 0.02)
  – Number needed to treat (NNT) = 20
  – No statistical benefit once delirium occurred
• Reduced total delirium episodes and days with delirium
• Reduced functional decline 14% vs. 33%

Inouye SK et al. NEJM 1999
HELP: Targeted Interventions

<table>
<thead>
<tr>
<th>Cognitive Impairment</th>
<th>Immobility</th>
<th>Visual Impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orientation/ Activities</td>
<td>Early mobilization</td>
<td>Visual aids, devices</td>
</tr>
<tr>
<td>Sleep Deprivation</td>
<td>Hearing Impairment</td>
<td>Dehydration</td>
</tr>
<tr>
<td>Non-drug sleep enhancement protocol</td>
<td>Hearing devices, remove earwax</td>
<td>Early recognition &amp; oral repletion</td>
</tr>
</tbody>
</table>

HELP Adherence

- Dose-response relationship between adherence to number of targeted interventions in HELP and reduction in delirium incidence

Pharmacologic Treatment for Hyperactive Delirium: Indications

- Patient at self-harm or harm to others
- Patient interfering with delivery of necessary medical care
- Extremely distressing psychotic symptoms
Management of hyperactive delirium

- Haldol 0.25 mg – 0.5 mg PO or IM BID; 1-5 mg IV for emergency situations
- Quetiapine 12.5 – 25 mg PO daily, titrated to 200 mg/day
- Olanzapine 2.5 – 5 mg PO daily, titrated to 10 mg/day
- Risperidone 0.25 mg BID, titrated to 4 mg/day

Use of anti-psychotics in agitated delirium

- Use for short duration (≤ 1 week), titrated to lowest effective dose and monitor for clinical effect
- Potential serious side-effects: Increased risk of stroke, cognitive decline and death in patients with dementia, QT prolongation, orthostatic hypotension, sedation, parkinsonism, falls, seizures
- No medications robustly proven to prevent delirium when used prophylactically

Delirium: Summary

- Assess for delirium in all elderly patients admitted to hospital and obtain collateral history to confirm change in baseline cognitive status
- Perform medication review and reduce psychoactive drugs as first step
- Use non-pharmacologic approaches to manage sleep, anxiety and agitation
- Reserve pharmacologic approaches and restraints for patients with severe agitation that poses harm or effective delivery of care
Frailty: Epidemiology

- Affects 10-20% of community-dwelling older adults and up to 60% of those in long-term care facilities
- Up to 25% of individuals ≥85 years
- Nearly half of older adults are considered “pre-frail” or at risk for progression to frailty

What is Frailty?

Expert consensus definition of frailty:

- “A medical syndrome with multiple causes and contributors that is characterized by diminished strength, endurance, and reduced physiologic function that increases an individual’s vulnerability for developing increased dependency and/or death.”


Frailty is a distinct clinical entity

- Co-morbidity defined as ≥2 of following 9 diseases: Angina, MI, CHF, cancer, claudication, anemia, diabetes, HTN, COPD

Frailty: Why it matters
Frailty predictive of adverse health outcomes:
- Falls
- Delirium
- Hospitalizations
- Hospital re-admissions
- Surgical complications
- Disability and functional dependence
- Nursing home placement
- Mortality

Frailty confers a 2-fold increase in mortality (after controlling for age, sex, co-morbidities and poor self-rating of health)
With the aging population, the incidence and prevalence of frailty with its associated adverse events will pose significant challenges for the healthcare system
Thus, diagnosis of frailty essential to identify a group of patients at high risk of adverse outcomes and in need of extra medical attention, support and resources
Frailty: How do we define frailty?

• Frailty is a syndrome with multiple dynamic contributors and factors
• Leads to increased vulnerability to decompensation from acute stressors
• Frailty tends to occur at extremes of BMI – important to note that obese individuals can be frail (termed “sarcopenic obesity”)

Frailty: Who do we screen and evaluate?

• ≥70 year old individuals or those with chronic medical conditions with ≥5% unintentional weight loss in the past 1 year
• No recommendation on which specific assessment tool to use
• Assessment tools need to be specific to and validated in the patient population of interest

Frailty: Assessment tools

FRIED PHENOTYPE OF FRAILTY
≥3 of the 5 following features:
• Unintentional weight loss (>10 lbs. in past year)
• Patient self-report of exhaustion
• Slow gait speed
• Low physical activity / endurance
• Weakness (hand grip strength)

PRE-FRAILTY
• 1 or 2 features present
Frailty: Assessment Tools

ROCKWOOD FRAILTY INDEX
• Accumulation of deficits model (multiple domains of function – physiological, psychological, social) quantified as a Frailty Index (FI) based on number of deficits present over the number of variables measured (40 variables).

ROCKWOOD CLINICAL FRAILTY SCALE (CFS-9)
• Clinical Frailty Scale – 9 (accounts for cognitive impairment).
• Predictive of adverse outcomes in hospital setting (medical and surgical patients).


The Effect of Frailty on Survival Before and After Frailty Screening Initiative (FSI) Implementation. The sample included 3878 before FSI implementation and 3878 after FSI implementation. Mantel-Cox log rank tests for differences in the survival distribution are as follows (P < .001 for overall difference before and after FSI implementation). Before FSI implementation, the lowest 2 strata of frailty were different from each other and from all the other strata (all P < .001). There was no difference between the 16 to 20 and 21 to 25 Risk Analysis Index (RAI) strata (P = .31), although the 16 to 20 RAI stratum was different from the highest 3 strata of frailty (all P < .05). The 21 to 25 RAI stratum was not different from the 26 to 30 (P = .16) or the 31 to 35 (P = .24) RAI stratum, but it was different from the 36 to 62 RAI stratum (P = .004). Although the lines of the highest 3 strata diverge, the differences did not reach statistical significance (all P > .05); however, this is likely attributable to the low numbers in these RAI strata. After FSI implementation, the lowest frailty stratum was different from all others (P < .001), but there was no difference between the next RAI strata (eg, 11-15, 16-20, and 21-25; all P > .20), although these 3 were different from the top 3 strata (all P < .03). There was no difference between the top 3 strata (eg, 26-30, 31-35, and 36-62; all P > .50), but they were all different from each of the lowest 3 strata (all P < .05). Hash marks indicate censored data.
Frailty: A clinical diagnosis of exclusion

Exclude potential conditions that can also present with fatigue, weakness, poor endurance and weight loss:
- Neuropsychiatric
- Endocrine/metabolic
- Hematologic and oncologic
- Cardiovascular
- Renal
- GI/Liver
- Infection
- Under/malnutrition

Frailty: General work-up

- Exam: Sit to stand from chair without arm support x 5, gait speed (Timed Up and Go Test)
- Labs: CBC, CMP, albumin, pre-albumin, vitamin B12, 25-OH vitamin D, TSH, urinalysis
- Age-appropriate cancer screening
- Additional work-up based on history, exam and risk factors

Frailty Interventions

- Comprehensive Geriatric Assessment (CGA)
- Fall risk assessment and prevention
- Physical interventions (supervised and/or home exercise program with both aerobic and muscle strengthening activities, balance, advancing as tolerated)
- Nutritional assessment and intervention
Frailty: Care of hospitalized frail patients

“Heightened surveillance” required for frail patients:
- Delirium prevention
- Fall risk assessment and prevention
- Minimize polypharmacy
- Nutritional intervention
- Satisfactory pain control
- Early catheter removal and bowel regime
- Pulmonary hygiene
- DVT prophylaxis

Frailty: Interdisciplinary Approach

- Interdisciplinary and patient-centered approach essential for frail patients with advanced and/or life-threatening or limiting illnesses
- Understand patient’s values, goals and priorities of care
- Identify surrogate decision maker, counsel on health care planning/written advanced directives
- Set realistic expectations about risks and benefits of potential interventions

Frailty: Summary

- Frailty is a syndrome that is common in older adults and significantly impacts patients, families/caregivers and confers a high risk of adverse health outcomes
- With rapid population aging, frailty will pose significant challenges to healthcare systems
- Frailty is a dynamic process and multi-modal interventions (exercise, nutrition, psychosocial) are necessary to prevent and treat frailty and improve quality of care and reduce healthcare costs
THANK YOU

Questions or comments:
- joehuang@uw.edu

Acknowledgements:
Thuan Ong, M.D., Associate Professor
UW Geriatric Medicine