Perioperative Care of the Elderly:

Should There Be a Different Approach?

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Objectives

- Describe the growth in the aging population and the coinciding increase in surgical procedures performed on these patients.
- Describe what factors more common in the elderly lead to increased perioperative morbidity and mortality.
- Discuss some of the most common postoperative complications in the elderly.
- Explain how a multi-disciplinary approach to perioperative care may reduce postoperative complications in geriatric patients.

Clinical Case

- 84 y/o 70kg male with a small bowel obstruction presenting for emergent exploratory laparotomy.
- PMH: CAD s/p PCI with DES 10 years ago, COPD, HTN, Parkinson’s disease.
- PSH: Former smoker (quit 20 yrs ago), 1-2 drinks/week, denies drugs, widower who has lived alone in an assisted living community for the last 2 years.
- Exercise tolerance: plays 9 holes of golf riding in cart 2x/wk, thinks he could walk up two flights of stairs.
- Medications: see chart.
- PE: nervous appearing, Mallampati 2, good oral opening, neck FROM, RRR, bilaterally distant breath sounds.

Growth of the Elderly Population

- U.S. Census Bureau numbers and projections:
  - 39.6 million Americans age 65 years and older in 2009
  - Expected to more than double by 2050.
  - Percentage of this group will increase from 13% to 20% of the total population by 2030.
  - Fastest growing segment of this group is individuals 85 years and older.
  - Growth is secondary to the aging baby boomers.

Morbidity and Mortality in the Elderly

- Compared to younger patients the elderly experience increased:
  - Post-operative complications.
  - Duration of hospital stay.
  - Need for discharge to destination other than home.
  - Post-operative dependency.
  - Mortality.
- Results in increased costs and utilization of resources.
- May result in decreased access to surgical care.
Morbidity and Mortality in the Elderly

- Veterans Affairs National Surgical Quality Improvement Project Study
- Compared patients ≥ 80 years to patients < 80 years who underwent surgery requiring general or neuraxial anesthesia at a VA hospital from 1991 to 1999
- Looked at 30 day mortality and 21 selected post-operative complications
- 5% increase in mortality with each year of age above 80 years
- Previous analyses showed 3.5% increase for patients of all ages

<table>
<thead>
<tr>
<th>Mortality Rate</th>
<th>Complication Rate</th>
<th>Mortality Rate with Complication</th>
<th>Mortality Rate without Complication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &lt; 80 (n=26,648)</td>
<td>2.8%</td>
<td>12.1%</td>
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<tr>
<td>Age ≥ 80 (n=568,263)</td>
<td>8.2%</td>
<td>20.0%</td>
<td>24%</td>
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Susceptibility of the Elderly
- Frailty
  - A condition or syndrome which results from a multisystem reduction in reserve capacity to the extent that a number of physiological systems are close to, or past, the threshold of symptomatic clinical failure
  - Key elements:
    - Unintentional weight loss
    - Exhaustion
    - Weakness
    - Slow walking speed
    - Low physical activity
    - Increased perioperative mortality
    - Increased postoperative dependence

Susceptibility of the Elderly
- Changes to pulmonary system
  - Decrease in chest wall compliance
  - Decrease in respiratory muscle strength
  - Blunted responses to hypoxia and hypercapnia
  - Increased closing capacity
  - Decrease in airway protection reflexes
  - Increased aspiration risk

Susceptibility of the Elderly
- Increased comorbidities
- Functional decline
- Deconditioning
- Decreased MAC
- Increased emergency presentations
- Increased delays for emergent surgeries
- Relative ignorance of practitioners
- Higher incidence of falls and orthopedic injury

Post-operative Complications
- Neurologic - 15%
  - Delirium
  - CVA
  - Peripheral nerve injury
- Cardiac - 12%
  - Arrhythmia
  - Heart failure
  - Myocardial infarction
- Pulmonary - 7%
  - Pneumonia
  - Prolonged ventilator support
  - Renal failure

Delirium
- Syndrome of acute change in cognition and alertness, and altered behavior
- Most common post-operative complication in the elderly (15%-53%)
- Associated with:
  - Higher mortality and higher rate of other complications
  - Higher rates of institutionalization
  - Longer length of stay
  - Decreased recovery of functional status
  - Greater costs and use of resources
Delirium

Risk factors
- Advanced age
- Cognitive and behavioral disorders
- Severe illness
- Renal insufficiency
- Anemia
- Hypoxia
- Poor nutrition
- Dehydration
- Electrolyte abnormalities
- Poor functional status
- Hearing and vision impairment
- Polypharmacy and use of psychotropic medications
- Presence of urinary catheter

Prevention
- Screen for risk factors, especially baseline cognitive deficits and substance abuse
- Consider correcting electrolyte abnormalities
- Avoid administering benzodiazepines and antihistamines, except in certain circumstances
- Avoid anticholinergic medications
- Favor light sedation if using monitored anesthesia care

Development of clinical protocols addressing the following: cognitive impairment, sleep deprivation, immobility, visual impairment, hearing impairment, and dehydration

Geriatric team involvement

Prophylactic haloperidol (studied in hip surgery patients)

Effective pain management
- Avoid meperidine
- Multimodal approach to reduce opioids

Cardiac Complications

Arrhythmia, heart failure, and myocardial infarction
- Age not consistently an independent risk factor
- Major adverse cardiac events occur more frequently in the elderly
- Elderly patients often have an increased incidence of independent risk factors
- CAD, CHF, DI, etc.
- Increased age associated with higher mortality after MI
- ACC/AHA guidelines should inform the anesthesiologist's preoperative assessment and perioperative management
- No age specific guidelines

Pulmonary Complications

Pneumonia, prolonged ventilator support, and reintubation
- Age is an independent risk factor
- Compared to patients under 60 years, patients age 60 or older are twice as likely to develop postoperative pulmonary complications
- No age specific guidelines

Other risk factors:
- COPD
- Functional dependence
- CHF
- DVT
- Infection
- Surgery time > 3 hours
- Upper abdominal or thoracic surgical site
- Emergency operation
- General anesthesia
- Perioperative transfusion
- Medial neurovascular blockade
Pulmonary Complications

- Prevention
  - Smoking cessation
  - Preoperative optimization in patients with baseline pulmonary disease
  - Avoid long acting neuromuscular blockade agents
- Lung expansion
  - Intraoperative - PEEP and recruitment maneuvers
  - Postoperative - pain control, physiotherapy, deep breathing, incentive spirometry, and CPAP
- Aspiration precautions

Preoperative Screening

- American College of Surgeons National Surgical Quality Improvement Program and the American Geriatrics Society best practice guidelines
- Cognitive Impairment and Dementia
- Decision-Making Capacity
- Depression
- Postoperative Delirium
- Alcohol and Substance Abuse
- Cardiac Evaluation

Preoperative Screening

- American College of Surgeons National Surgical Quality Improvement Program and the American Geriatrics Society best practice guidelines
- Pulmonary Evaluation
- Functional Status, Mobility, and Fall Risk
- Frailty
- Nutritional Status
- Medication Management
- Patient Counseling
- Preoperative Testing
  - Recommend hemoglobin, renal function tests, and albumin be obtained on all geriatric surgical patients

Multidisciplinary Approach

- Perioperative care team
  - Surgeon, anesthesiologist, geriatrician, nurse specialists, occupational therapists, physical therapists, and social workers
- Perioperative assessments
  - Cognitive and functional assessments
  - Identification of comorbidities to be optimized
  - Early recognition of common postoperative complications (e.g. delirium)
  - Prediction and planning of discharge needs
- Comprehensive Geriatric Assessment
  - Similar approach on the medical side that has shown significant reduction in dependence and mortality at 1 year in hospitalized patients

Multidisciplinary Approach

- Proposed Benefits
  - Alleviate the problem of provider knowledge gap
    - Geriatricians and geriatric nurses bridge the gap in their communications with the surgical providers
    - Reduced length of stays
    - Reduced mortality
    - Improved discharge planning
    - Earlier return to function
  - Perioperative Surgical Home
    - Provides an opportunity for anesthesiologists to coordinate this care team approach for geriatric patients

Different Approach?

- Tailor your preoperative workup to look for and consider what characteristics may lead to increased morbidity and mortality
- Consider carefully your premedication
  - May avoid benzodiazepines, antihistamines, anticholinergics
  - Favor lighter rather than deeper sedation
- Consider how differences in physiology may effect the necessary drug dosages
- Be mindful of postoperative goals
  - Remember that delirium is associated with increased dependence
  - Consider coordinating care with a team including geriatric specialists
Improved Functional Status

Bibliography


