Competent Pain Management in the Elderly Person With Cancer

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Headlines!

“Undertreatment of Pain Goes to Court as Elder Abuse”
“Nurse Withheld Pain Medication From an Elderly Dying Patient”
“Oregon Physician uses Tylenol to Treat an Elderly Man in Pain From Terminal Cancer”

Incidence of Pain in the Elderly

- 25-50% of community dwelling seniors
- 45-80% of nursing home residents
- 85% have at least one chronic condition that may cause pain
- 50% of cancer occurs in patients 65 and >

Pain in the Elderly - HCFA Demonstration Project

- 38% of nursing home residents with cancer reported pain daily
- 26% of these patients received no analgesics
- Patients who received analgesics:
  - 16% received WHO I analgesic
  - 32% received WHO II analgesic
  - 26% received WHO III analgesic

Predictors of Pain in the Elderly

- Patients > 85 years old more likely to receive no analgesia
- Other predictors of inadequate analgesia:
  - diverse ethnic group
  - low cognitive performance
  - # of other medications that the patient is already receiving
Pain in Patients With Cancer

- Cancer-related pain
  - Bone metastases, epidural spinal cord compression, plexopathies, peripheral neuropathies, abdominal pain
- Post surgical pain
- Treatment-related pain
  - Peripheral neuropathy
  - Mucositis
  - Postherpetic neuralgia
- Acute/procedural pain
- Chronic, nonmalignant pain

Prevalence of Nonmalignant Pain Syndromes

- Back pain
- Arthritis
- Chronic Headaches
- Osteoporosis
- Osteoarthritis
- Diabetes
- Rheumatoid Arthritis
- Fibromyalgia

Case Study With Mr. G

72 year-old
New dx. NSCLC & bone metastases
Health Hx.
- Osteoarthritis - Tylenol & Motrin
- COPD - inhalers
- Type II Diabetes - Glipazide & glucophage
Social Information
- Married
- Retired professor
- Cares for frail wife with cognitive impairment
- Adult children at a distance

Case Study - Mr. G

- Pain
  - Presented with back and rib pain - refused medication
  - Hx. Osteoarthritis
  - Numbness and burning feet
- Increased SOB with exertion
- Poor appetite
- More lethargic than usual
- States that pain is not a problem

Barriers - Health Care Professionals

- Lack of education
- Lack of consistent assessment
- No focused geriatric education
- Pain is a natural outcome of age
- Pain perception diminishes with age
- Overestimates of the dangers of opioid use in the elderly
- Fear or misuse of terms: addiction, tolerance, physical dependence
Definitions
- Addiction - a primary, chronic, neurobiologic disease, with genetic, psychosocial, and environmental factors influencing its development and manifestations. It is characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving.
- Physical Dependence - a state of adaptation that is manifested by a drug class specific withdrawal syndrome that can be produced by abrupt cessation, rapid dose reduction, decreasing blood level of the drug, and/or administration of an antagonist.
- Tolerance - a state of adaptation in which exposure to a drug induces changes that result in a diminution of one or more of the drug’s effects over time.

Barriers - Patients and Families
- Believe that pain is inevitable with aging
- Fear that pain is an indication of progressive disease
- Do not want to distract provider from active treatment
- Do not want to be seen as bothersome or hypochondriacally
- Reluctance to use the word pain
- Reluctance to report pain

Pathophysiological Changes in the Elderly: Implications for Pain Management
- Cortical atrophy
- Change in neuronal communication
  - Depression
  - Movement disorders
- Memory changes controversial
- Cognition
  - Intelect - acquired and new knowledge
  - Psychomotor

Cognitive Changes
- Depression
- Movement disorders
- Memory changes controversial
- Cognition
  - Intelect - acquired and new knowledge
  - Psychomotor
ACUTE CHANGE IN MS

- Antiparkinsonian drugs
- Corticosteroids
- Urinary incontinence drugs
- Theophylline
- Emptying drugs
- CV drugs
- H₂-blockers

- Antimicrobials
- NSAIDS
- Geropsychiatric drugs
- ENT drugs
- Insomnia drugs
- Narcotics
- Muscle relaxants
- Seizure drugs

Dementia v Delirium

<table>
<thead>
<tr>
<th></th>
<th>Delirium</th>
<th>Dementia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset</td>
<td>Acute</td>
<td>Insidious</td>
</tr>
<tr>
<td>Course</td>
<td>Fluctuating</td>
<td>Steadily progressive</td>
</tr>
<tr>
<td>Consciousness &amp; orientation</td>
<td>Clouded, disoriented</td>
<td>Clear until late stages</td>
</tr>
<tr>
<td>Attention &amp; memory</td>
<td>Poor short term memory; inattention</td>
<td>Poor short term Memory without marked inattention</td>
</tr>
<tr>
<td>Psychosis</td>
<td>Common</td>
<td>Less common</td>
</tr>
</tbody>
</table>

Types of Delirium

- Hypoactive
  - Sedative, subtle
  - Associated with opioid initiation, dehydration
- Hyperactive
  - Agitation, neurotoxicity association (myoclonus, hyperalgesia, allodynia, perceptual disturbances)
  - Associated with chronic opioid use, metabolite accumulation

Pathophysiology

- Biochemical changes caused by the opioid
- Opioid metabolites
- Renal impairment
- Lack of tolerance
- Hepatic impairment?

Opioids - Impact on Cognitive Function

- Avoid the obvious
  - Meperidine, propoxyphene
- Morphine - metabolites M3G and M6G
- Hydromorphone - metabolite H3G? role
- Fentanyl - case reports
- Methadone
  - Cumulative effect with protein binding may contribute to cognitive effects
  - Case reports of cognitive impairment

Cognition Changes - Implications for Pain Management

- Assessment
  - Dementia versus Delirium
  - Depression - Anxiety
- Avoid medications with long ½ life
- Assess cognition
- Adjust plan of care for cognitive impairment

Cardiopulmonary Changes

Cardiac Changes in the Elderly
- Cardiac index decreases about 1% per year after age 30
- Slower circulation
- Slower onset to affect
- Consider history
  - Congestive heart failure - anthracyclines, other etiology
  - Cardiovascular disease
- Contribution to respiratory depression

Respiratory Changes in the Elderly
- Respiratory muscles weaken
- Increase in respiratory rate
- Decrease in vital capacity
- Decline in functional alveoli
- Difficulty clearing secretions
- Decreased response to hypoxemia or hypercapnea

Respiratory Changes - Implications for Pain Management
- Respiratory depression
- Desaturation
- Culprits
  - Opioids
  - Muscle relaxants
  - Benzodiazepines
  - Anticonvulsants
- **Start low and go slow!**

Be Careful With Duragesic
- Advantages: easy route, ? constipation
- 25 mcg Duragesic = approximately 75 mg oral morphine
- Do not use on opioid naïve patients!
- Elderly have higher fat/muscle ratio that can prolong the half-life of lipophilic drugs
- Naloxone drip needed for overdose

Renal Changes
Renal Changes in the Elderly

- Smaller kidneys
- Decreased renal blood flow and glomerular filtration rate (10% each decade beyond age 40)
- Risk for sodium depletion
- Dehydration
- Sensitivity to medications

Cox-1 versus Cox-2

- Activation of COX-1 leads to production of:
  - Prostacyclin
  - PGE₂
  - PGI₂
  - Thromboxane A₂

- COX-2 is induced in:
  - Macrophages
  - Fibroblasts
  - Endothelial cells
  - Chondrocytes
  - Osteoblasts
  - Synoviocytes

Renal Changes - Morphine

- Morphine-3-glucuronide (M3G)
  - conjugation accounts for over 50%
  - antagonizes analgesic effect of morphine and M6G
  - ? neurotoxic side effects
- Morphine-6-glucuronide (M6G)
  - conjugation accounts for over 5%
  - more potent analgesic activity than morphine
  - contributes to overall analgesic effect
- Higher concentrations of M3G and M6G after development of delirium

Accumulation of Morphine Metabolites

- Variable with route of administration
  - 1st pass hepatic glucuronidation higher M3G and M6G/morphine plasma concentration ratio
  - potentially more side effects with oral route
- Variable with repeated administration
  - results in accumulation of M6G and greater contribution to the analgesic effect and potentially more sedative side effects

Gastrointestinal Changes
### Gastrointestinal Changes in the Elderly
- Swallowing less coordinated
  - Risk for aspiration
- Decrease in GI motility
  - Intestinal atrophy
  - Decrease in mucus secretion
- Liver
  - Biotransformation of drugs occurs mostly in the liver
  - Glucuronidation rarely impaired in hepatic failure
  - Decreased ability to metabolize drugs
- Increased fat – decreased albumin

### GI Changes - Implications for Pain Management
- Can the patient swallow oral medications?
  - Short term?  Long term?
  - GI tract intact
  - How large are the pills?
  - Liquid versus pills
    - Morphine solution, Oxyfast solution
    - Sprinkled opioids

### Constipation
- Compounded by age and opioids
- Decreased fluid in the bowel
- Decrease in peristalsis
- Increase in anal sphincter tone
  - **Stool Softener + Stimulant!!**

### Hepatic Changes
- **Beware**
  - anticonvulsants, psychotropics, anticoagulants
- Danger of Acetaminophen – 4 Gm maximum/day
- **Methadone**
  - liver is the primary route of drug elimination
  - reports of hepatotoxicity
  - use with caution or avoid with hepatic failure

### Hepatic Changes - Implications for Pain Management
- Large inter-individual variations
- Variations in individual patients from day to day and week to week!
- Methadone bound to Alpha 1-acid glycoprotein (AAG)
  - Can be displaced from AAG binding sites by propanolol, chlorpromazine, prochlorperazine, thioridazine, and imipramine enhance methadone effectiveness

### Methadone and Protein Binding Issues
NSAID Considerations for Elderly
- Elderly considerations
  - have low serum albumin levels
  - likely to have high serum NSAID levels
  - higher incidence of NSAID side effects

Considerations for Mr. G
- Renal function?
  - Bone metastases
- Liver function?
- History of opioid use
  - Refusal of medication significant
  - History of side effects?
  - Negative experience?