Geriatric Pain Management: 101

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Abstract

- The geriatric population is exploding.
- Acute and chronic pain is an important public health concern impacting our geriatric population disproportionately.
- Chronic pain and persistent pain are used interchangeably but persistent pain is preferred as there is less baggage associated with the newer term.
- Pain is often underreported in the geriatric population due to the mistaken belief that pain is a normal part of the aging process.
- This presentation will focus on the geriatric physiologic changes that impact both the pharmacokinetics and pharmacodynamics of pain treatment modalities as well as provide an overview of relevant information for effective pain management of this growing population.

revalence

- According to the Administration on Aging, the geriatric population (persons 65 years or older) numbered 39.6 million in 2009 (the most recent year for which data is available).
- Geriatrics make up 12.9% of the U.S. population, about one in every eight Americans.
- It has been projected that by the year 2030, there will be 72.1 million geriatrics (doubling from year 2000 numbers) (Administration on Aging, 2009).
- Persistent pain, a painful sensation that continues for a prolonged period of time may or may not be associated with a disease process, is prevalent in older adults (American Geriatrics Society, 2014).

ncidence of Geriatric Persistent ain

- Affects nearly 30% of the elderly. Persistent pain is most frequently associated with musculoskeletal disorders (arthritis, osteoporosis with concomitant fractures and/or degenerative spine conditions/lumbar spinal stenosis. (BMJ Best Practice, 2014, American Geriatrics Society, 2009).
- The incidence of geriatric chronic/persistent pain is likely underreported due to many elderly patients incorrectly believing that pain is a normal process of aging (Kaye, Balluch & Scott, 2010).
- Many chronic/persistent pain disorders are treatable and should **NOT** be considered part of the normal aging process.
- Untreated persistent pain in geriatric patients can result in depression, poor quality of life, and loss of independence.

Consequences of Geriatric Persistent Pain

- Associated with a number of adverse outcomes for both the patient and the caregiver.
- Adverse patient effects: functional impairment, falls, slow rehab, mood changes, decreased socialization, sleep and appetite disturbances, increased health care costs, morbidities.
- Adverse caregiver effects: caregiver strain
- Caregiver attitudes can substantially impact the geriatric patient's pain experience.
- Persistent pain treatments have their own risks and/or adverse effects.
- (American Geriatrics Society, 2009).

vidence Based Guidelines for harmacologic Management

Available agents:

Nonopioids (includes acetaminophen and NSAIDs)

Opioid analgesics

Adjuvant drugs

Other medications

Unique considerations: clinical manifestations and concurrent illness make pain evaluation more complex, geriatrics are more likely to experience medication-related side effects/complications

Despite these challenges pain can usually be effectively managed.

(American Geriatrics Society, 2009)

ain Assessment: Relies on Patient elf Report

- Is hampered by pain being under-reported in this population.
- Even severe pain may not be easily assessed for a variety of personal, cultural and psychologic reasons.
- Cognitive impairments in the patient make assessment even more difficult.
- Interdisciplinary assessment has been identified as an effective way to better identify treatable contributing pain factors. When the underlying pain source is not easily identified or treated, an interdisciplinary approach is advocated (American Geriatrics Society, 2009).
- Evaluate pain intensity, effect on daily function and quality of life.

ain Threshold in Geriatric Patients

- Gibson (2003) conducted a meta-analysis of over fifty studies that examined age differences in sensitivity to induced pain. The effect size was 0.074 ($p < 0.0005$) indicating that there is definite evidence of an increase in pain threshold with advancing age.
- There may be differences in pain threshold depending on the type of pain. Somatosensory thresholds for non-noxious stimuli increase with age, whereas pressure pain thresholds decrease and heat pain thresholds show no age-related changes (Latienbacher, et al, 2005).

rinciples of Pharmacological Management

- Must carefully weight potential benefits/risks
- Maximize patient outcomes (requires that the prescriber be knowledgeable and regularly monitor for adverse effects).
- Set mutual and realistic pain management goals: complete pain relief is not realistic. Instead focus on improved function and quality of life.
- There will be age-associated differences in effectiveness, sensitivity and toxicity, pharmacokinetics and pharmacodynamics.
- Geriatrics are heterogenous which makes prediction of optimal dosages and side effects difficult.
- Start low and proceed with careful titration upward ("start low and go slow").

rinciples

- Oral route is preferred as a rule:
- Convenient
- Maintenance of steady blood concentrations
- Drug effects can be seen in 30 minutes to 2 hours.
- Use short acting agents for episodic pain.
- Use PRN only for intermittent, episodic pain. Very poor option for cognitively impaired patients. In this population scheduled administration is preferred.
- Use around-the-clock dosing for continuous pain, preferably with a long-acting agent. Most patients will also require a fast-onset short-acting agent for BTP.

mpact on Pharmacokinetics

- GI Absorption: slowing of GI transit may prolong effects of continuous release enteral drugs, opioid related bowel dysmotility may result, altered pH (through drugs such as antacids or disease processes) may reduce absorption of some drugs. Surgical alterations in the GI tract may also impact enteral absorption.
- Transdermal Absorption: few changes based on age, different patch technology may be an issue with some topical administration. Temperature may affect topical absorption.
- Distribution: Increased fat may increase volume of distribution for fat-soluble drugs. Aging and obesity may result in longer effective half-life.

mpact on Pharmacokinetics

- Liver Metabolism: Oxidation is variable and may decrease which may prolong drug half-life. Genetic enzyme polymorphisms may affect some cytochrome enzymes. Liver disease (Cirrhosis, Hepatitis, Liver Tumors) disrupt oxidation and usually do not impact conjugation.
- Renal Excretion: GFR decreases = decreased drug excretion. Kidney disease increases risk of drug toxicities.
- Active Metabolites: Reduced renal clearance prolongs metabolite(s) effects. Renal disease will increase half-life.
- Anti-cholinergic side effects: increased confusion, constipation, incontinence, movement disorders. These anti-cholinergic effects will be enhanced in geriatric patients with neurologic disorders.

lon-opioid Analgesics: cetaminophen

- Acetaminophen – effective for osteoarthritis and LBP. No GI bleeding or adverse renal effects.
- Major concerns: renal toxicity has been associated with the use of long-term high dose acetaminophen. Hepatoxicity due to metabolite. Reduce maximum dose 50 – 75% in patients with hepatic insufficiency or ETOH abuse.
- Recommended as first line therapy for pain (considered safer than traditional NSAIDs).

lon-Opioid Analgesics: NSAID

- Nabumetone (Relafen): Recommended starting dose 1 gram daily. This drug has a relatively long half life, minimal anti-platelet effects.
- Other recommended options: choline magnesium trisalicylate, salasate, low dose celecoxib (higher doses are associated with higher incidence of GI and CV SE), naproxen sodium (less cardiovascular toxicity), ibuprofen (concern with concurrent use of ASA due to inhibition of ASA anti-platelet effects).

- Not recommended: ketorolac (high potential for GI AE and renal toxicity)

Opioid Analgesics

- Opioids have become a major component of geriatric pain management.
- Older patients are high risk for NSAID and Cox-2 inhibitor adverse effects. Their use may result in serious, life-threatening GI and CV AE or GI bleeding.
- Controlled trials have established the efficacy of various opioids in the treatment of persistent pain (musculoskeletal: osteoarthritis and LBP and several neuropathic disorders: diabetic PN and postherpetic neuralgia).
- Long-term effectiveness studies for persistent non-cancer pain are lacking (for all age groups).

Opioid Analgesics: Require an Opioid Trial

- All opioids should be initiated on a trial basis with clearly defined mutually developed therapeutic goals.
- The opioid trial should involve several attempts to titrate the opioid to an efficacious dose without inducing intolerable SE/AE.
- It must be understood that the opioids will be discontinued if the opioid trial is unsuccessful.
- Treatment plan must be multi-modal (must include functional restoration and psychosocial modalities) and include non-pharmacologic therapies.

Opioids: Risks and Benefits

- Most SE decrease with long-term use, except for constipation.
- LA oxycodone (Oxycontin) is a q 12 hour drug. In some frail elderly its effects may persist for more than 12 and up to 24 hours. Watch closely.
- Respiratory depression: impacts RR, minute volume and O2 saturation. Most serious AE. Usually results from excessively rapid dosing increases and drug-drug interactions with other CNS depressants.
- Suppressed production of hypothalamic, pituitary, gonadal and adrenal hormones.
- These hormonal changes manifest most commonly as testosterone deficiency in men with associated fatigue, depression and decreased libido.
- Opioid abuse – risk increases with protracted use; especially in patients with substance abuse disorders (including tobacco abuse).

Opioid Addiction

- Addiction is a chronic, neurobiologic disease.
- Characterized by one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, craving.
- Abuse likelihood correlates with a number of genetic and environmental factors.
- Low risk in older patients with no current of PMH of substance abuse.
- Use Universal Precautions as it is not possible to identify or predict those who will become addicted or who will divert opioids.
- Use initial risk assessment screening tools: ex. Opioid Risk Tool (ORT)

Opioid Underuse

- Older age is significantly associated with lower risk for opioid misuse and abuse (American Geriatrics Society, 2009).
- Underuse of opioids is the greater problem in this population.
- Providers need to fully assess and educate older patients about opioid benefits/risks.
- Many geriatrics may not fill all prescriptions or use opioids sparingly due to safety concerns: fear of addiction or other factors: cost, fear of constipation or other SE, and the negative social stigma associated with opioid use.

Adjuvant Drugs

- A number of drugs from various drug classes that were developed for other medical purposes have been found to be effective in altering or attenuating pain perception in many pain producing conditions, without raising the pain threshold.
- May be used alone or in combination. Especially effective in neuropathic pain.
- Antidepressants: TCA – effective for neuropathic pain but the AE profile contradicts use in geriatric population. SNRIs have been proven effective with neuropathic pain. SSRIs have not.
- Anticonvulsants: Gabapentin and Pregabilin (and others with similar MOA at voltage-gated calcium ion channels) are beneficial with a good SE profile for geriatrics.

Adjuvant Drugs

- Others: agents that alter neural membrane potentials, ion channels, cell surface receptor sites, synaptic neurotransmitter levels and other neuronal processes involved in pain signal processing.
- All agents must be carefully titrated and monitored frequently.

Other Drugs for Persistent Pain

- Some research evidence and anecdotal evidence indicates that other drugs as a group are less reliable than opioids and traditional analgesics in the treatment of persistent pain.
- Therefore, their use is a matter of clinical judgment.
- These agents include:
- Corticosteroids – effective for rheumatic and auto-immune disorders, suggested efficacy with some neuropathic pain syndromes (sympathetic dystrophies), cancer pain.
- Muscle Relaxants – although these agents may relieve skeletal muscle pain their effects are non specific and are NOT related to muscle relaxation. Avoid use of cyclobenzaprine which is essentially identical to amitriptyline (TCA). Carisoprodol is highly abused.

Other Drugs for Persistent Pain

- If muscle spasm is pain generator consider use of a drug with known effects on muscle spam such as benzodiazepines or baclofen.
- Baclofen – an agonist of GABA Type B. It is a second line drug for paroxysmal neuropathic pain it has been successfully used in patient with severe spasticity as a result of CNS injury, demyelinating conditions and other MS disorders.
- Benzodiazepines – current evidence does NOT support a direct analgesic effect from benzos.
- Topical analgesics – Lidoderm patches (5% lidocaine) have been studied in treatment of neuropathic pain. Effective in cases of postherpetic neuralgia but benefit does not compare to that found with systemic use of gabapentin.

doderm Patches

- Advantages: ease of use, absence of toxicity (with doses up to four patches in 24 hours) and lack of drug interactions.
- AE are rare and mild (mostly related to skin rash).
- Contraindicated in liver failure due to decreased lidocaine clearance (with associated increased risk of lido toxicity).

ummary

- Acetaminophen should be considered as initial and ongoing pharmacotherapy (especially in cases of MS pain). Absolute contraindication: liver failure. Relative contraindication: hepatic insufficiency, chronic alcohol abuse or dependence. Maximum daily dose 3 gm/daily. For chronic daily use consider max daily dose of 2 gm/daily.
- Non-selective NSAIDs and COX-2 inhibitors use rarely. Use with caution in highly selected individuals when other therapies have failed. Absolute contraindication: current/active PUD, chronic kidney disease, heart failure. Relative contraindication: HTN, H. pylori, history of PUD, concomitant use of steroids or SSRIs. Geriatrics using non-selective NSAID should also use PPI or misoprostol.

ummary

- Opioids – an opioid trial should be considered with moderate to severe pain, functional impairment or diminished quality of life. Continuous pain treat around-the-clock (Oxycontin or SR MSO4). Assess for SE/AE. When prescribing SR products anticipate need for SA (hydrocodone or oxycodone combo products or MSIR)BTP medication. Reassess frequently.
- Adjuvants – all geriatric patients with neuropathic pain are candidates, FM patients or patients with other types of refractory persistent pain should be given an adjuvant trial. Avoid TCA use. Start low and go slow. Ensure an adequate therapeutic trial before DC of seemingly ineffective treatment.
- Other Drugs – all patients with localized neuropathic pain are candidates for topical lidocaine. All patients with localized non-neuropathic pain are candidates for topical NSAIDs.

ummary

- Persistent pain is NOT an inevitable part of aging but is a fairly common medical problem of geriatrics.
- The treatment of persistent pain is complicated by multiple issues that are far less likely to occur in younger patients.
- Barriers to effective pain management include challenges to proper pain assessment (especially in the cognitively impaired), under-reporting of pain (due to the mistaken belief it is a normal part of aging), the atypical manifestations of pain in the elderly, and the need for the prescriber to appreciate and understand the differences in pharmacokinetics and pharmacodynamics in aged patients.
- Effective pain management is possible and is more likely with a multi-modal, interdisciplinary approach.

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