

REVIEW ARTICLE OPEN ACCESS

Pain Management in Geriatric Patients

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Abstract

Introduction: Pain has been recognized as the “fifth vital sign” since 1999 due to its significant impact on quality of life [1]. Although the prevalence of pain is high in the geriatric population, it is frequently underrecognized and undertreated [3]. Age-related physiological and pharmacokinetic changes, limited knowledge regarding these alterations, polypharmacy, and communication difficulties significantly complicate pain management in elderly patients [2]. This review evaluates pain management in geriatric patients in terms of pain assessment challenges, pharmacological and non-pharmacological treatment approaches, and interventional pain management techniques in light of current literature [4,7,9].

Methods: In this review, pain management in geriatric patients was evaluated based on current literature with a focus on pain assessment difficulties, pharmacological and non-pharmacological treatment strategies, and Interventional pain management approaches [4,7,9].

Results: Pain assessment in geriatric patients is often inadequate due to sensory deficits, cognitive decline, and the inability to adequately express symptoms [6]. In pharmacological treatment, age-related pharmacokinetic changes necessitate careful dose titration of opioids and nonsteroidal anti-inflammatory drugs (NSAIDs) [7,8,10,11]. In chronic pain, adjuvant agents such as antidepressants may provide additional analgesic benefit [12,13].

Non-pharmacological approaches, including physiotherapy, exercise, and psychological interventions, reduce medication requirements while improving quality of life and decreasing drug-related complications [17]. According to the World Health Organization’s analgesic ladder, interventional pain management techniques may be considered in cases where pharmacological and non-pharmacological treatments fail to provide adequate pain control. These include epidural and intra-articular injections, radiofrequency thermocoagulation, neuromodulation, and intradiscal procedures, which have demonstrated efficacy in conditions such as osteoarthritis, spinal stenosis, disc herniation, and neuropathic pain [18-21].

Conclusion: Effective pain management in geriatric patients requires consideration of physiological changes and a multidisciplinary, individualized approach integrating pharmacological, non-pharmacological, and interventional methods [4]. Early application of interventional techniques in appropriately selected patients may significantly improve pain control, functional capacity, and quality of life [18,21].

Introduction

Pain has been recognized by the World Health Organization as the “fifth vital sign” alongside temperature, pulse, respiration, and blood pressure since 1999 due to its significant negative impact on quality of life and metabolic balance [1]. The prevalence of pain is high in the geriatric population, and it is frequently under treated. Age-related physiological and pharmacogenetics changes, communication barriers, poly pharmacy, and concerns regarding adverse drug effects make pain management in elderly patients challenging [2].

In this review, pain assessment, pharmacological and non-pharmacological treatment modalities, and Interventional pain management strategies in geriatric patients are discussed in a comprehensive manner.

Pain is one of the most common symptoms in elderly patients. Approximately 60% of independently living individuals over the age of 60 and up to 80% of long-term care residents experience daily pain [3]. Despite its high prevalence, pain is often

considered a natural consequence of aging and is therefore under treated [3].

Inadequate pain management leads to significant psychosocial consequences such as depression, anxiety, sleep disturbances, and behavioral changes. Therefore, pain management in geriatric patients requires a multidisciplinary approach aimed not only at symptom relief but also at improving quality of life [4].

Pain Assessment in Geriatric Patients

Accurate pain assessment in geriatric patients is challenging due to multiple factors. Pain is often considered a natural and inevitable part of aging, leading to underestimation by both patients and healthcare professionals. In addition, visual, auditory, and cognitive impairments limit effective communication and accurate pain reporting [3].

Furthermore, both clinicians and patients may avoid analgesic use, particularly opioids, due to concerns about adverse effects.

Poly pharmacy further increases concerns regarding drug interactions and adverse events [5]. The perception that pain requires extensive diagnostic evaluation may also lead patients to underreport symptoms.

Additionally, pain may be associated with terminal conditions such as cancer or end-of-life processes, leading to psychological resistance due to fear of poor prognosis or death. As a result, pain is frequently underreported and under treated in geriatric patients [6].

Age-Related Physiological and Pharmacological Changes

Aging significantly affects drug absorption, distribution, metabolism, and elimination. Total body water decreases while body fat increases, resulting in an increased volume of distribution for lipophilic drugs and a decreased volume of distribution for hydrophilic drugs. Examples of lipophilic drugs include diazepam, fentanyl, and midazolam, whereas morphine, gentamicin, and atenolol are examples of hydrophilic drugs.

Reduced plasma protein binding increases the free fraction of drugs, potentially enhancing pharmacological effects. In addition, age-related declines in hepatic and renal function, as well as changes in the central and peripheral nervous systems, significantly alter drug responses. These physiological changes increase the risk of adverse effects of analgesics and necessitate careful dose titration in geriatric patients [7,8].

General Approach to Pain Management

The World Health Organization's three-step analgesic ladder recommends a stepwise escalation of treatment according to pain severity. In mild pain, non-opioid analgesics such as paracetamol and NSAIDs are used with adjuvant therapies. In moderate pain, weak opioids are combined with non-opioids and adjuvants. In severe pain, strong opioids are used in combination with non-opioids and adjuvants [9]. Geriatric pain management should be addressed under three main domains: pharmacological treatments, non-pharmacological treatments, and interventional pain management. Additionally, management of comorbid conditions, sleep disturbances, and psychological status are integral components of care [4].

Pharmacological Treatments

Opioids should be used at low doses with careful titration in geriatric patients due to increased risks of respiratory depression, sedation, bradycardia, hypothermia, constipation, urinary retention, and physical dependence [10].

Acetaminophen acts via central prostaglandin inhibition and can be safely used up to 4 g/day in appropriate patients without significant hepatotoxicity. NSAIDs, however, represent one of the most problematic drug groups in the elderly due to risks of renal impairment, gastrointestinal bleeding, and cardiovascular complications [4,11].

Chronic pain is often associated with depression; therefore, adjuvant antidepressants such as amitriptyline and venlafaxine may provide both analgesic effects and improvement in sleep quality. Patients should also be monitored for suicide risk [12,13].

Management of Comorbid Conditions

Chronic conditions such as diabetes, rheumatoid arthritis, and sickle cell anemia that contribute to chronic pain should be adequately managed [14-16]. Sleep disorders and psychological conditions must be treated concurrently, as they significantly influence pain outcomes [12].

Non-Pharmacological Treatments

Non-pharmacological interventions are a key component of pain management in geriatric patients. Modalities such as TENS, heat/cold therapy, acupuncture, exercise, and massage, as well as cognitive behavioral therapy, relaxation techniques, and hypnosis, can be effectively used. These approaches reduce analgesic requirements and minimize drug-related adverse effects, particularly in chronic pain conditions [17].

Interventional Pain Management

Interventional pain management offers significant advantages in geriatric patients. These techniques are usually performed under local anesthesia, often without the need for sedation, have minimal systemic effects, and may require only a single or short-term application [18].

Common Interventional techniques include epidural and intra-articular injections, radio frequency ablation, modularization, intrathecal procedures, electrotherapy, and ozone therapy, particularly for osteoarthritis [19,20]. These interventions are effective in conditions such as osteoarthritis, lumbar disc herniation, spinal stenosis, failed back surgery syndrome, neuropathy pain, and prosthetic neuralgia [21].

Conclusion

Pain remains a major clinical problem in the geriatric population due to its high prevalence and multifactorial nature. Age-related physiological changes, comorbidities, poly pharmacy, and communication difficulties complicate its assessment and management [3,6-8].

Therefore, pain management in elderly patients should not be limited to symptomatic treatment but should follow a multidisciplinary approach integrating pharmacological, non-pharmacological, and Interventional strategies (4). Pharmacological treatment requires careful drug selection and dose adjustment considering age-related pharmacokinetic and pharmacodynamic changes [7,8,10].

Non-opioid and opioid analgesics, along with adjuvant therapies, are effective when appropriately used; however, NSAIDs should be administered cautiously due to renal and gastrointestinal risks [4], [11-13]. Non-pharmacological methods improve pain control and reduce medication requirements [17].

Interventional pain management techniques represent an important treatment option in geriatric patients due to their minimally invasive nature, low systemic side effect profile, and targeted efficacy [18]. Early use of interventional procedures such as epidural and intra-articular injections, radiofrequency thermocoagulation, neuromodulation, and intradiscal techniques can significantly improve outcomes in chronic pain conditions including osteoarthritis, lumbar spine disorders, spinal stenosis, neuropathic pain, and cancer-related pain [19-21].

In conclusion, effective pain management in geriatric patients requires an individualized treatment plan, comprehensive assessment, and early integration of interventional techniques when appropriate, ultimately improving pain control, functional capacity, and quality of life.

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