It is illegal to post this copyrighted PDF on any website. Treatment Modalities for Chronic Pain in Elderly Patients With Depression: A Systematic Review

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ABSTRACT

Objective: To review the best pharmacologic and nonpharmacologic interventions in the management of chronic pain in elderly patients with depression.

Data Sources: A systematic review of the literature was performed following the PRISMA guidelines and using PubMed. Articles published from 2010 to 2020 were included in the search. Search terms included (*major depressive disorder* OR *MDD* OR *unipolar depression*) AND (*chronic pain*) AND (*elderly*).

Study Selection: The PubMed search identified 540 articles. All studies were in English and included reports about pain and depression in elderly individuals aged \geq 65 years.

Data Extraction: Articles were reviewed in 2 phases: abstract review followed by full-text review.

Results: Abstracts were reviewed for relevance, and a total of 37 articles were identified for fulltext review. In this phase, articles not meeting the elderly age criteria (\geq 65 years) or not discussing any treatment modalities were excluded. Nine papers were included after full-text review. The results showed cooccurrence of chronic pain and depression in 13% of the elderly population. Common pain symptoms were related to cancer, back pain, and arthritis.

Conclusions: The findings emphasize the importance of individualized assessment of chronic pain in elderly patients with mood disorders such as depression. Since chronic pain and depression are independent risk factors for suicide, it is crucial to complete a thorough history and physical examination and to apply relevant screening tools for both depression and pain.

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*Corresponding author: Soroush Pakniyat-Jahromi, MD, 1276 Fulton Ave, Bronx, New York 10456 (soroushpakniyat@gmail.com). A ging is the process of becoming older and consists of biological, physiologic, environmental, psychological, behavioral, and social changes.¹ The US population aged \geq 65 years is estimated to double over the next 30 years: from 48 million to 88 million.² This growing elderly population shows the importance of focusing on further recognition and management of the medical and mental comorbidities of aging. Chronic pain and depression are 2 prevalent conditions among the elderly population.^{3–6}

Depression is the most prevalent mental health illness in the elderly. The overall prevalence of major depression in the healthy population aged ≥ 65 years is 1%–4%. In some special groups, this number is higher—25% in elderly individuals with chronic medical illness and 25%–50% in nursing home residents.^{7–9}

Chronic pain is the most prevalent symptom in the elderly and can be classified as follows¹⁰:

- Chronic cancer pain: may result from tumor invasion or treatments such as chemotherapy or radiotherapy-induced neuropathy.
- Chronic neuropathic pain: such as thalamic stroke, peripheral neuropathy and radiculopathy, diabetic neuropathy, alcohol-related neuropathy, gluten neuropathy, and entrapment neuropathies.
- Chronic musculoskeletal pain: includes fractures, inflammatory and degenerative arthritis, myositis, tendonitis, or as a result of bad posturing as in Parkinson disease.
- Chronic posttraumatic or postsurgical pain.
- Chronic visceral pain: following inflammation (ie, chronic pancreatitis), obstruction (ie, bowel obstruction), and ischemia (ie, mesenteric ischemia).
- Chronic headache and orofacial pain including cranial neuropathies and temporomandibular disorders.
- Chronic primary pain including low back pain, identified as neither musculoskeletal nor neuropathic, and painful conditions causing significant emotional distress, such as irritable bowel syndrome and fibromyalgia.

The prevalence of chronic pain in the elderly population is 55% in those aged ≥ 60 years¹¹ and 62% among those aged ≥ 75 years.¹² The prevalence of chronic pain is higher among elderly patients in nursing homes (approximately 83%).^{13,14}

Nearly 13% of the elderly population have depression and chronic pain simultaneously.¹⁵ The risk of depression increases 2.5 to 4.1 times with concurrent chronic pain.^{16–20} Also, patients with major depressive disorder are 6 times more likely to have neuropathic pain and 3 times more likely to have non-neuropathic pain.²¹ Therefore, due

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Clinical Points

- Chronic pain and depression are comorbid, bidirectional conditions in the elderly and are both independent risk factors for suicide; hence, they should be diagnosed and sufficiently treated.
- A combination of pharmacologic and nonpharmacologic intervention (eq, duloxetine plus cognitive-behavioral therapy) tailored for each individual may result in better outcomes in elderly patients with comorbid depression and chronic pain.
- Selection of treatment options that address both pain and depression at the same time is critical in the elderly and could minimize polypharmacy and complications arising from drug-drug interactions.

to the strong correlation of these 2 conditions, treatment of one can potentially improve the other.

The goal of this review is to assess the current literature systematically with a special focus on the management of chronic pain in elderly individuals with depression. We discuss the best pharmacologic and nonpharmacologic interventions in the management of chronic pain in these patients.

METHODS

Data Source

A systematic literature review was conducted using the PRISMA model in PubMed. Search terms included (major depressive disorder OR MDD OR unipolar depression) AND (chronic pain) AND (elderly).

Study Selection

Inclusion criteria for the studies were as follows: (1) report on depression and chronic pain in the elderly (aged ≥ 65 years); (2) published in English; (3) case reports, case series, and meta-analyses



Figure 1. Inclusion and Exclusion of Articles at the Abstract and Full-Text Review Phases

include a description of treatment modalities. There were no restrictions regarding sex.

Data Extraction

Articles were reviewed in 2 phases: abstract review followed by full-text review. Eligible articles were included in the study by the 5 independent authors. Any inconsistencies in the inclusion or exclusion of articles were discussed and resolved by consensus and involvement of the authors.

RESULTS

The PubMed search yielded 540 articles. Abstracts were reviewed for relevance based on the inclusion criteria. A total of 37 articles were finalized for full-text review. In this phase, articles not meeting the elderly age criteria (aged ≥ 65 years) or not discussing any treatment modalities were excluded. Nine articles^{10,22-29} were included after full-text review as described in Figure 1. A brief description of each study is summarized in Table 1. Our review showed co-occurrence of chronic pain and depression in 13% of the elderly population.¹⁰ Common pain symptoms were related to cancer, back pain, and arthritis.

DISCUSSION

In this section, we summarize the key points of the articles reviewed for this study and the utility of the information in clinical practice. All the patients who participated in the studies had a documented diagnosis of depression and chronic pain. Chronic back pain is the most common type of pain reported in the elderly.¹⁷

A variety of treatments can be categorized as pharmacologic and nonpharmacologic. The treatments include dog-assisted therapy (DAT), DepRessiOn and Pain (DROP) program, medical marijuana, transcranial magnetic stimulation (TMS), mindfulness-based cognitive therapy, pain care management, duloxetine combined with pain care management, cognitive-behavioral therapy (CBT), and antidepressants.

Pet therapy has a unique role in building a therapeutic alliance between patients and health care providers. It helps the elderly by activating their cognitive and memory circuits and improving their communication with others.³⁰ Ambrosi et al²² conducted a randomized controlled study to evaluate the effectiveness of DAT in depression, anxiety, and pain symptoms in institutionalized elderly patients. DAT was added to the usual pharmacologic treatments

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			Weaknesses	NA	Patients came from a wide sociodemographic and clinical population, resulting in a broac relevance	Poor adherence to the program by patients and physicians	Cross-sectional study with restricting inference of causalit	Age range and sex not specifie.	Small sample size	Pain medication use was not tracked	Small sample size; limited number of ethnic minorities in the study	Small sample size; observational design and lack of randomization; lack of follow-up measurements to assess whether the effects are sustained over time	
			Strengths	Review article	Samples were selected from a single long-term nursing care facility	Large sample size	Large sample size	Review article	Diverse sample	Large sample size; the cohort's average age was 77 y, which is seldom studied	All participants were elderly	Comparison of elderly patients with a group of adult patients with SSD to explore the differences in elderly SSD patients	gnetic stimulation.
			Observation	Discussed in the article	DAT reduced symptoms of depression in the elderly and reduced pain by 11.4% (P =.46, d=0.18)	DROP program is only useful to decrease depression, as no significant benefits were noted for management of pain	Chronic pain patients receiving medical marijuana have lower depression levels than those receiving opioids	Given the safety profile of TMS compared to medications such as opioids, TMS may be promising in addressing pain and unipolar depression in the elderly	Mindfulness-based cognitive therapy could be beneficial in management of depression and chronic pain in the elderly	Pain care management participants reported reduction in pain and anxiety	After 12 weeks of treatment, 46.7% of patients had a remission of depression and 93.3% had a positive pain response	CBT (18 sessions) can improve pain intensity and pain disability in patients aged > 60 y	tic symptom disorder, TMS= transcranial ma
			Agent Studied	Pharmacologic and nonpharmacologic interventions	Dog-assisted therapy (DAT)	Collaborative care intervention (DROP program)	Medical marijuana	TMS	Mindfulness-based cognitive therapy	Telephone-based management of chronic pain in older adults in an integrated care program	Duloxetine and care management	CBT	applicable, SSD = somat
		iic Review	Sex (male/ female)	Both	Both	Both	Both	Unspecified	Both	Both	Both	Both	l Pain, NA = not a
		the Systemat	Age Group	Elderly	≥ 65 y	18–80 y	18 to > 65 y	Elderly (range unspecified)	≥ 18 y	71–84 y	≥ 60 y	62–78 y	DepRessiOn and
		Included in 1	Sample Size, n	NA	Treatment group: 17, control group: 14	328	329	NA	26	1,747	30	16 (7 completed the intervention)	lerapy, DROP = [
		[:] the Articles	Setting	NA	Institution for the elderly in Italy	8 urban primary care centers in Spain	2 large pain centers in Israel	NA	Outpatient clinic	Telephone based	Outpatient clinic	Mental health institute in the Netherlands	/e-behavioral th
		escription of	Study Design	Review article	Randomized controlled trial	Randomized controlled trial	Cross- sectional	Review article	Randomized controlled pilot study	Case-control study	12-week open-label study	Prospective comparative pilot study	s: CBT= cognitiv
		Table 1. D	Article	Zis et al ¹⁰	Ambrosi et al ²²	Aragonès et al ²³	Feingold et al ²⁴	lriarte and George ²⁵	de Jong et al ²⁶	Helstrom et al ²⁷	Karp et al ²⁸	Verdurmen et al ²⁹	Abbreviation

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Chronic Pain Treatment in Depressed Elderly

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•	Table 2. F	- sychopharma	acologic	Managem	ient of	Pain	and
1	Depressi	on					

Effect

Class/Medication							
<u> </u>							

Selective serotonin reuptake inhibitors					
Fluoxetine Citalopram Fluvoxamine Sertraline	Low back pain and cervical pain Moderate analgesic effect in chronic pain Central post stroke pain Chronic pelvic pain syndrome in men				
Selective-norepinephrine reuptake inhibitors					
Duloxetine Venlafaxine	Neuropathic and musculoskeletal pain Neuropathic and musculoskeletal pain				
Tricyclic antidepressants					
Amitriptyline	Peripheral neuropathic, cancer, and orofacial pain; fibromyalgia				
Clomipramine	Central neuropathic, cancer, and orofacial pain; fibromyalgia				
Nortriptyline	Peripheral neuropathic, cancer, and orofacial pain; fibromyalgia				
Serotonin antagonists					
Trazodone	Cancer pain and fibromyalgia and reuptake inhibitors				

for the treatment group once a week for 10 weeks, and each session took 30 minutes. DAT reduced symptoms of depression in the elderly and reduced pain by 11.4% (P=.46, d=0.18).²²

The DROP program is an integrated, multicomponent approach to comorbid chronic musculoskeletal pain and depression in primary care settings.²³ This program includes a care manager for optimization of the depression treatment, plus a psychoeducational component to encourage patients to develop strategies and skills needed for the management of their pain. Aragonès et al²³ concluded that the DROP program is only useful to decrease depression, as no significant benefits were noted for management of pain.

Prescription opioids have decreased in the past 2 decades, despite their effectiveness in management of chronic pain, due to the reported risks for addiction, diversion, and overdose.³¹ Medical marijuana has been widely used for management of chronic pain as an alternative to prescription opioids in the United States. Depression levels were studied in pain patients using medical marijuana versus opioids.²⁴ The study²⁴ reported that chronic pain patients receiving medical marijuana have lower depression levels than those receiving opioids for pain. However, potential psychiatric manifestations of chronic cannabis use (such as increased risk for the incidence of psychosis among patients with predisposition), as well as physical manifestations of chronic use (including but not limited to chronic bronchitis) should be carefully weighed against any potential benefits.³²

Psychiatric applications of repeated TMS (rTMS) include obsessive-compulsive disorder and medication-resistant depression.³³ It is proven that application of rTMS to the left dorsolateral prefrontal cortex affects a cortico-subcortical network involved in mood regulation.³⁴ In a study by Iriarte and George,²⁵ the use of TMS was reviewed for management of unipolar depression, cognitive impairment, smoking cessation, and chronic pain. The study²⁵ concluded that given the safety profile of TMS compared to medications such as opioids, TMS may be promising in addressing ghted PDF on any was beite. pain in the elderly population. Klein et al³³ reported that

neuropathic pain syndromes benefit most from rTMS.

A randomized controlled pilot study on mindfulnessbased cognitive therapy (MBCT) for unipolar depression in patients with chronic pain found that MBCT could be beneficial in the management of depression and chronic pain in the elderly.²⁶ MBCT is done in groups and is therefore cost efficient and can be added to the available treatments for depression and chronic pain as an effective intervention.

A study²⁷ of telephone-based management of chronic pain in older adults in an integrated care program concluded that pain care management decreased the interference between pain and daily activity with no effect on level of pain.

In another study,²⁸ the authors assessed the effect of duloxetine and care management treatment on depression and chronic back pain in elderly patients aged \geq 60 years. Baseline depression and pain were measured using the Montgomery-Asberg Depression Rating Scale and the McGill Pain Questionnaire–Short Form. After 12 weeks of treatment, 46.7% of patients had a remission of depression and 93.3% had a positive pain response. In this study,²⁸ the average duration for depression remission was 7.6 weeks, and the average duration for pain response was 2.8 weeks.

A vicious cycle exists wherein depressive thoughts lead to behaviors and somatic reactions such as pain and intense emotions, which lead back to depression. Given the cognitive and emotional components of pain, it is believed that CBT could address both chronic pain and depression in the elderly by improving positive expectations to reduce the severity of pain perception.^{35,36} A prospective comparative explorative pilot study²⁹ in 2 clinical populations demonstrated that CBT could improve pain intensity, pain disability, depression, and anxiety in the elderly. The role of pharmacotherapy in treating depression and chronic pain has been reviewed extensively and is summarized in Table 2.¹⁰

It is recommended to treat each patient individually based on their past medical history and the side effect profile of the medications discussed in Table 2. For instance, selective serotonin reuptake inhibitors should be used with caution in elderly patients at risk of bleeding.³⁷

It is necessary for clinicians to use the biopsychosocial model to best assess an individual's unique pain condition and depression. In this model, biological, psychological, and social factors that might be contributing to an individual's chronic pain or depression are considered. Since chronic pain and depression are independent risk factors for suicide,³⁸ it is crucial to complete a thorough history and physical examination and to apply relevant screening tools for both depression and pain.

One limitation of this study is that only PubMed was used as the search engine for review of the literature. Another limitation is that we included only studies published from 2010 onward; however, the goal was to focus on the more recent and practical treatment modalities for treatment of chronic pain in the elderly with depression.

Chronic Pain Treatment in Depressed Elderly It is illegal to post this copyrighted PDF on any website. Management of chronic pain and depression, especially

Management of chronic pain and depression, especially in the elderly population, requires a multidisciplinary team-based approach, and all disciplines including general practitioners, geriatricians, psychiatrists, physical therapists, and pain clinicians should work collaboratively to deliver the best care possible. Each patient should be assessed carefully, considering their psychosocial factors and access to certain resources such as transportation and family support. Past and current medical and psychiatric history, allergy history, and home medications should be carefully reviewed. One major issue in treating elderly patients with depression and chronic pain is polypharmacy and risk of drug-drug interaction. One strategy is to select treatment options that address both pain and depression concurrently.

Due to the complexity and high comorbidity, we recommend a combination of pharmacologic and nonpharmacologic interventions for management of pain and depression in the elderly to achieve a better outcome and to improve the quality of life in this growing population. Management of chronic pain in elderly patients with depression is challenging. Pain and depression combined represent a challenge for the patient, as well as their families and clinicians. On the individual level, chronic pain in the elderly can result in less social interaction, isolation, helplessness, and hopelessness, which may lead to depression and a poor quality of life. On a larger scale, these patients may become a burden on their families and the health system. A thorough assessment is key when treating elderly patients with chronic pain and depression.

This review highlights the importance of meticulous history taking, screening for depression and chronic pain using appropriate tools, and treatment using a combination of pharmacologic and nonpharmacologic options. More studies are needed to highlight the relationship between chronic pain and depression and to introduce more treatment options with safer side effect profiles for the elderly population.

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