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Overview

A COMPREHENSIVE REVIEW OF MUSCULOSKELETAL PAIN IN THE ELDERLY

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ABSTRACT: Musculoskeletal pain is highly prevalent among older adults, affecting 40–60% of this population and contributing significantly to disability and reduced quality of life. Chronic pain in the elderly is multifactorial and often underdiagnosed or undertreated due to complex clinical presentations, cognitive impairment, and misconceptions about pain as a normal part of aging. It is closely associated with geriatric syndromes such as falls, frailty, sleep disturbances, depression, and cognitive decline, and should be assessed in a comprehensive biopsychosocial context. Multimorbidity and polypharmacy further complicate treatment decisions. Non-pharmacologic strategies such as physical therapy, behavioral interventions, and mind-body therapies are strongly recommended. When medications are used, individualized dosing and careful monitoring are essential due to altered pharmacokinetics in older adults. Improving access to evidence-based non-drug therapies and strengthening clinical research are key strategies for enhancing pain care in this vulnerable population.

Keywords: chronic pain, older adults, musculoskeletal system, multimodal approach, nonpharmacologic treatment.

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1. OVERVIEW

In the elderly, chronic musculoskeletal pain is very common, with prevalence rates ranging from 40-60%. Multi-site pain contributes significantly to disability in the elderly. Chronic pain is defined as pain that persists beyond normal healing time, typically lasting more than 3 to 6 months. Musculoskeletal disorders are considered a significant threat to maintaining health in old age and are associated with falls, frailty, depression, anxiety, sleep disorders, reduced mobility, and cognitive function decline. Additionally, medical treatments for pain reduction are estimated to cost the United States approximately $300 billion annually, and this burden continues to increase. Unfortunately, pain may be inadequately treated or inappropriately controlled in the elderly for several reasons, including failure to accurately identify the exact cause of pain, erroneous beliefs that pain is part of the aging process, cognitive impairment with varying pain presentations, patients' incomplete description of medical history, and limited clinical examination time due to patients having multiple comorbid conditions. This emphasizes the importance of understanding guidelines for assessing and managing chronic musculoskeletal pain in the elderly [1-4].

Chronic pain should be considered in the context of geriatric syndromes (e.g., falls, frailty, cognitive decline/memory loss, and sleep disorders). Studies show a relationship between moderate to severe pain levels and rapid memory decline and reduced attention capacity as well as executive function in community-dwelling older adults. Due to countless contributing factors and its close relationship with geriatric syndromes, chronic pain in the elderly is considered by some experts to be a geriatric syndrome [1].

The elderly often have multiple comorbidities, affecting treatment considerations. Defined as the presence of more than two comorbid conditions, multimorbidity is estimated to exist in at least half of the elderly population. Consequently, polypharmacy (typically defined as five or more medications) is also very common; it is associated with falls, increased mortality rates, and longer hospital stays. This emphasizes the need for careful consideration of relative risks and benefits of pain medications in the elderly, as unintended side effects on comorbidities and polypharmacy may offset the benefits of other medications [1],.

Mental health needs careful consideration in the context of pain. The relationship between chronic pain and depression and anxiety has been clearly established and is complex, including exacerbating functional decline, altering neuroinflammatory states, reducing social integration capacity, and poor coping ability. Furthermore, there appears to be a bidirectional relationship between pain and depression in the elderly, where pain and depression are independent risk factors for each other. This relationship emphasizes the complexity of pain experience in the elderly and reinforces the comprehensive biopsychosocial approach to chronic pain management [1].

With a comprehensive approach, clinicians should consider age-related organ function changes that significantly impact drug pharmacodynamics and pharmacokinetics. Age-related decline in liver and kidney function can affect drug processing, reducing clearance rates and altering drug efficacy. Decreased muscle mass and increased fat content can also affect drug distribution in the elderly, influencing drug tolerance and effectiveness. These changes emphasize the importance of avoiding a "one-size-fits-all" approach when prescribing medications for the elderly [1].

Patients have different pain experiences, heavily influenced by pain type, physical perception of pain, emotional state and response to pain, ability to cope with pain, and patients' personal beliefs about pain. When approaching chronic pain in the elderly, coordinated care is needed to assess and address these factors [1]. Comprehensive assessment, followed by a multidisciplinary approach to pain management, emphasizing the importance of functional rehabilitation and non-drug treatments, is particularly appropriate for elderly patients with complex multiple morbidities.

2. PAIN PERCEPTION IN ELDERLY

The elderly tolerate acute pain better

than chronic pain. This may correlate with differences in timing and origin/causes of chronic versus acute pain. Sensory mechanisms (neural defects or decline in pain perception pathways), behavioral factors (such as strong pain acceptance and tolerance capacity and less catastrophizing), as well as hormonal (estrogen) and social factors (social support) may influence pain perception in the elderly .

The interaction between pain perception and aging remains poorly understood. First, it is important to understand that pain experience in the elderly is shaped by changes in biological, psychological, and social factors that occur during aging. Aging is associated with decreased pain perception, such as postoperative pain, cancer pain, and peritonitis pain. Pain has a warning function, avoiding tissue damage before harmful stimuli. This function may be impaired in the elderly with increased pain thresholds and decreased sensitivity to mild pain, leading to increased injury and undiagnosed disease. Contrary to acute pain, chronic pain is more difficult to tolerate in the elderly. In the elderly, the impact of persistent hip or knee pain symptoms is very significant, often progressing toward symptoms becoming more severe and accompanied by other accumulated symptoms. The elderly may be less sensitive to heat-induced pain and more sensitive to mechanical pain when compared to younger adults.

A systematic review and meta-analysis reported that mean pain thresholds were significantly increased in the elderly (over 60 years) compared to younger individuals when responding to thermal, electrical, and pressure stimuli, as well as rectal and esophageal distension. Regarding differences in pain tolerance thresholds, mean values did not differ significantly between young and older groups, although the differences appeared substantial. Based on this evidence, pain perception is greatly affected by the aging process itself, but it also depends on the presence of other common diseases in the elderly .

Progressive degeneration of intervertebral discs with aging is associated with chronic low back pain. MicroRNAs and changes in autophagy processes are related to disc degeneration in the elderly. Along with increased inflammatory mediators such as cytokines and metalloproteinases, these mechanisms may explain low back pain symptoms in the elderly. A clinical study demonstrated that young adults with chronic low back pain showed reduced musculoskeletal sensation, an effect seen in the elderly regardless of chronic low back pain diagnosis. This suggests that aging is associated with weakening of peripheral and central mechanisms involved in sensory transmission.

Additionally, chronic pain is considered a risk factor for the elderly by affecting reflex responses. A cross-sectional study of over 300 elderly individuals demonstrated that the severity of musculoskeletal pain was associated with prolonged simple leg reflex times. Another study evaluating a group of elderly individuals revealed that pain negatively affected all gait parameters, primarily gait speed, possibly through changes in cognitive pathways. Data suggest complex neural mechanisms linking chronic pain and increased fall risk in the elderly. Furthermore, pain control may also prevent injury risks in the elderly, helping prevent falls and related consequences, while also improving mobility in elderly individuals with chronic pain .

Unresolved prolonged disorders (such as memory loss, inflammatory pain, or viral infections) create continuous pain sensation or nerve stimulation and may be the cause of chronic pain in the elderly. Psychological factors may increase persistent pain conditions; additionally, chronic pain may exacerbate psychological problems (e.g., depression), reducing the distinction between cause and effect. Parkinson's disease, Alzheimer's disease, depression, burning mouth syndrome, and viral infections are particularly associated with chronic pain, and their presence may impact pain and physical function in geriatric patients. Therefore, these comorbidities need to be diagnosed and treated in elderly patients with chronic pain .

3. INITIAL APPROACH

3.1. History Taking

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Table 1. Relevant Domains for Assessing Chronic Musculoskeletal Pain in the Elderly [1].

Pain location
Pain duration (monthly or yearly)
Pain characteristics: acute, subacute, chronic
Frequency and impact of pain Pain intensity on numerical rating scale, based on recall over the past 7 days of referred pain or associated symptoms
Other pain locations: digestive, headache, widespread pain, etc.
Previous surgeries: type and date of surgery, response
Previous treatment methods used to control pain Lifestyle changes Psychological/behavioral Physical therapy and rehabilitation Complementary, alternative, and mind-body treatments Medication treatment
Physical function: household tasks (e.g., vacuuming, yard work), climbing stairs, walking at least 15 minutes, running errands
Mental health: depression, anxiety, post-traumatic stress disorder (if applicable)
Sleep disorders
Alcohol use
Tobacco use
Demographics: age, gender, race/ethnicity, employment status, highest education level, body mass index

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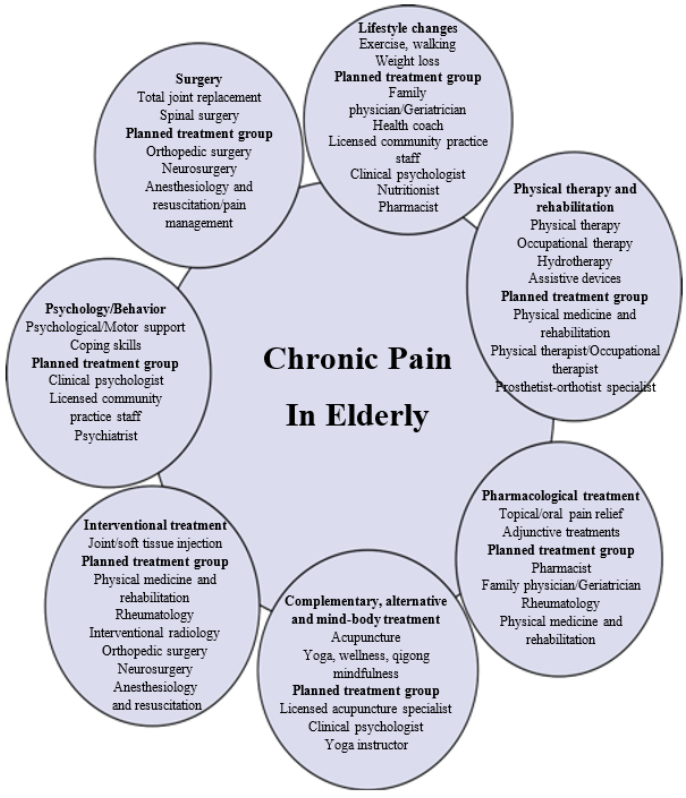

Hình 1. Các thành phần của quản lý đa ngành ở người cao tuổi bị đau hệ vận động mãn tính

in geriatric patients. Therefore, these comorbidities need to be diagnosed and treated in elderly patients with chronic pain .

These domains and categories are adapted from the Minimum Dataset from the 2014 NIH Task Force Report on Research Standards for Chronic Low Back Pain.

An important and often overlooked part of comprehensive pain assessment is understanding patients' expectations about determinants of treatment success. History taking facilitates this exchange, as understanding the daily impact of pain can often help identify specific pain areas that patients want to address. While "no pain" may be an unrealistic goal, it is possible that with multimodal treatment approaches, patients will be able to control pain and related symptoms while improving function. The focus is linking pain management stories with patient-identified values and realistic care goals, as personal experiences such as participating in social activities, continuing preferred activities, and sleeping better all contribute to the pain experience [1].

3.2. Clinical Examination

Clinical examination for chronic pain includes inspection and palpation of painful areas and measuring muscle strength as well as range of motion of affected joints. Examine the joint opposite to the affected joint to assess symmetry. Joints near and far from the pain site should also be examined, particularly considering sources of referred pain, such as knee pain manifestations accompanying hip, pelvic, or ankle pathology. Assess gait to detect abnormalities, which may suggest underlying core problems such as reduced muscle strength, sensation, or coordination ability. Timed walking ability tests are effective and valuable tools for assessing mobility and are often used as part of frailty assessment. Patient behavior and reactions when pain occurs are particularly useful for those with cognitive impairment, as it may help better stratify pain intensity. Beyond these core principles, the examination should be tailored with specific local tests [1].

3.3. Diagnostic Testing

Imaging studies to find abnormalities commonly found in the elderly. Signs such as degenerative changes in the spine or hip joints do not necessarily contribute significantly to pain assessment or disability. The key to interpreting musculoskeletal pain imaging is determining whether clinical symptoms correlate with findings seen on imaging studies. X-rays can often help assess the degree of joint degeneration or find causes that may contribute to other symptoms. Findings often do not correlate significantly with pain frequency or intensity, and imaging use often does not improve outcomes. Because benefits are usually limited, imaging may cause unnecessary psychological and financial burden for patients. Imaging should be considered on a case-by-case basis, especially when "red flag" symptoms (infection, malignancy, spinal cord compression, etc.) suggest an urgent problem requiring evaluation [1].

4. TREATMENT

4.1. Team Formation

Treatment of chronic pain in the elderly involves multiple modalities (non-drug, rehabilitation, pharmacological, and surgical). Therefore, multidisciplinary coordination is needed to address pain and accompanying comorbidities (Figure 1). If an elderly patient has multiple comorbidities, this requires more human resources. Clear communication (especially in large teams) is key. Each team member is extremely important in building therapeutic relationships with patients. Counseling about expected chronic pain treatment courses and reassuring patients is key to achieving better treatment outcomes.

4.2. Non-Drug Treatment: First-Line

Comprehensive and effective treatment uses multiple treatment modalities, prioritizing non-drug treatments. Although considered first-line therapy, unfortunately, they are often offered after trying drug and invasive treatments. Non-drug therapies are particularly attractive in the elderly because of their favorable efficacy-to-safety ratio. Non-drug treatments include physical therapy, occupational therapy, exercise (including walking), psychological interventions (cognitive behavioral therapy, acceptance

therapy, pain coping skills training, cognitive restructuring, and commitment therapy), and complementary, alternative, and mind-body treatments, tailored to patients' capabilities, preferences, and clear treatment goals.

Physical activity is always recommended as a major component of any treatment plan for chronic pain in the elderly. Exercise can reduce mortality rates, improve function, increase strength, reduce cardiovascular disease risk, promote social interaction, and reduce pain. Providing specific exercise advice, activity plans, and monitoring is important for exercise uptake and maintenance in the elderly.

In many patients, behavioral and psychological therapies for chronic pain are effective. For example, mindfulness therapies are effective in reducing short-term and long-term pain and improving short-term function. Mindfulness and meditation therapies show promise for improving pain and function, although more research is needed on their effectiveness. These treatments should be considered for feasibility, availability, accessibility, cost, and patient motivation to participate [1].

From another perspective, a systematic study conducted by Perna and colleagues indicated that dietary monitoring and supplementation with specific nutrients and antioxidants may reduce the need for pain medication use to control musculoskeletal pain in the elderly. However, drug-nutrient and/or herbal supplement interactions cannot be ignored in this population. According to Du and colleagues, adding 40g of freeze-dried blueberry powder daily for 4 months reduced pain and stiffness and improved gait performance in elderly individuals aged 45 to 79 years with symptomatic knee osteoarthritis. These effects may be explained by the anti-inflammatory properties of polyphenols in the diet. On the other hand, marine-derived omega-3 fatty acid and vitamin D supplementation had no effect in elderly individuals with chronic knee joint pain.

4.3. Pharmacological Treatment

Pain sensation has not decreased despite increased pain medication prescriptions in recent decades. Recent developments in pain medication prescribing in the elderly have not been thoroughly studied . When considering drug therapies, the common mantra is "start low and go slow," adjusting medication doses and monitoring for side effects. Table 2 describes medications commonly used in treating chronic pain in the elderly. Sometimes, pain relief is achieved when combining drugs from two different drug groups. Addictive drugs are not recommended in osteoarthritis treatment guidelines. As mentioned, careful consideration of comorbidities and risks associated with each selected drug must be considered [1].

The popularity of paracetamol (acetaminophen) has increased while regular use of NSAIDs has decreased. This is consistent with risks of gastrointestinal bleeding, hypertension, cardiovascular events, and kidney failure associated with NSAIDs, especially in those with comorbidities and polypharmacy. The use of addictive drugs has increased in healthcare facilities and in the general population, raising concerns about serious risks associated with their use in the elderly population .

There is evidence that a significant proportion of elderly people use prescribed pain medications less than what is prescribed and only when pain is severe. Mastering medication use may be an important factor in maintaining confidence in self-efficacy .

Close patient monitoring is very important when managing chronic pain in the elderly. Follow-up visits assess treatment effectiveness, encourage maintenance of behavioral changes that help reduce pain, and allow monitoring of treatment side effects. These follow-up visits also help build trust and strengthen the therapeutic relationship between patient and provider [1].

5. MUSCULOSKELETAL CONDITIONS IN ELDERLY

5.1. Osteoarthritis

Osteoarthritis is the most common type of arthritis, and approximately half of the population over 65 years old in the United States is diagnosed with osteoarthritis. Age is one of the strongest risk factors for osteoarthritis; other factors include gender (women have higher rates and more

Table 2. Common Medications for Treating Musculoskeletal Pain in the Elderly [1]

Treatment	Indication	Safety Notes	Guidelines
		Topical	
Capsaicin	Minor muscle/joint pain (back pain, muscle strain, sprains, arthritis, bruising, cramps, muscle pain or stiffness); neuropathic pain related to diabetic neuropathy or post-herpetic neuralgia.	Wash hands with soap and water immediately after application (unless hands are part of the treatment area) or wear gloves. - Do not use within 1 hour before or immediately after bathing - Avoid concurrent use with other topical agents or heating pads	- Conditional recommendation for knee osteoarthritis- Not recommended for hand osteoarthritis - Insufficient data on hip osteoarthritis
Methyl salicylate and menthol	Minor muscle/joint pain and aches (back pain, muscle strain, sprains, arthritis, bruising)	- Do not apply to face, wounds, rashes, damaged skin, mucous membranes, or immediately after bathing- Avoid concurrent use with other topical agents or heating pads	- Apply patch for maximum 8 hours (maximum 2 patches/24 hours)
Lidocaine	Post-herpetic neuralgia, trigger point pain	- Use the lowest effective dose to reduce pain for the shortest duration (prolonged use increases risk of systemic absorption, potentially affecting central nervous system and cardiovascular system)- Avoid contact with water or external heat sources	- Insufficient data in osteoarthritis- Apply patch for maximum 12 hours (maximum 1 patch/24 hours)
NSAIDs	Knee and hand osteoarthritis; may also be used for ankle, elbow, foot or wrist; acute pain (muscle strain, sprains, bruising)	- Use the lowest effective dose to reduce pain for the shortest duration (due to increased risk of potential side effects on the digestive system and possible effects on kidney function) - Do not apply to wounds, eyes or mucous membranes	- Strong recommendation for knee osteoarthritis- Conditional recommendation for hand osteoarthritis - Insufficient data on hip osteoarthritis - Apply maximum 4 times daily, less if patient takes anticoagulants or has chronic kidney disease
		Oral	
Acetaminophen	Mild and dull pain	- Consider all sources, not exceeding 3g/day - Monitor liver function	- Conditional recommendation for knee, hip and hand osteoarthritis - Limited effectiveness for chronic back pain and not recommended for regular use

Treatment	Indication	Safety Notes	Guidelines
NSAID	Inflammatory conditions including tendinitis; mild to moderate osteoarthritis pain	- Use the lowest effective dose to reduce pain for the shortest duration - Monitor gastrointestinal, cardiovascular and kidney side effects	Beers Criteria recommends avoiding prolonged NSAID use and completely avoiding indomethacin and ketorolac in elderly patients - Use should only be considered if no viable alternatives exist and can reduce risk of gastrointestinal bleeding when using proton pump inhibitors or misoprostol
Tramadol	Moderate to severe acute or chronic pain where non-addictive analgesics are insufficient	- Monitor sodium levels (risk of SIADH or hyponatremia) and respiratory depression - Complex interactions with cytochrome P450 3A4 inducers, 3A4 inhibitors or 2D6 inhibitors	- Beers Criteria recommends avoiding overprescription and reducing doses of current prescriptions - Conditional recommendation for knee, hip and hand osteoarthritis
Opioids	Moderate to severe acute or chronic pain where non-addictive analgesics are insufficient	- Use the lowest effective dose to reduce pain for the shortest duration - Monitor respiratory depression (especially in patients taking concurrent benzodiazepines or gabapentinoids) - Potential side effects with cytochrome P450 3A4 inducers or 3A4 inhibitors	Not recommended for knee, hip and osteoarthritis unless no other alternatives remain
Duloxetine	Neuropathic pain, central sensitization pain, other chronic pain	- Monitor serum sodium - Risk of hyponatremia	Conditional recommendation for knee/hip/hand osteoarthritis - Recommended for fibromyalgia pain- Consider use in chronic back pain
Gabapentin/Pregabalin	Neuropathic pain, central sensitization pain	- May have sedative effects and cause dizziness - Potential side effects on mood	- Recommended for fibromyalgia

NSAIDs: Non-steroidal anti-inflammatory drugs; SIADH: syndrome of inappropriate antidiuretic hormone

severe symptoms), overweight/obesity, joint malalignment (varus or valgus deformity), and previous injury. Although described as "wear and tear" of joints, the pathophysiology of osteoarthritis is a complex interaction of inflammation, previous trauma, biochemical reactions, and metabolic disorders. Osteoarthritis commonly affects the knee, lumbar spine, hands, and hip joints. Clinically, patients present with pain, decreased joint mobility, joint enlargement, swelling, instability, and joint stiffness or crepitus [1].

Diagnosis of osteoarthritis is usually based on history and examination. Assessment of functional decline should be performed routinely, and consideration should be given to using appropriate assistive devices and orthotic equipment to help maintain function and improve

pain. Recent guidelines do not recommend routine blood tests or X-rays for diagnosing or monitoring typical osteoarthritis cases, although they are very useful in atypical cases [1].

Current evidence-based osteoarthritis guidelines recommend a comprehensive approach and emphasize non-drug therapies. Exercise is also a core component of osteoarthritis treatment. Exercise combined with dietary changes provides synergistic effects in improving pain and function, and it appears that pain relief benefits and functional improvement increase with the degree of weight loss in overweight and obese adults. Specific exercises must be tailored to individual capabilities and preferences, although joint protection strategies should be used, considering low-impact activities. Other non-drug treatments include behavior-based therapies (e.g., cognitive behavioral therapy) and complementary, alternative, and mind-body treatments (e.g., tai chi) [1].

Drug treatment includes applying topical therapies before oral treatment with relative safety and side effects. Topical non-steroidal anti-inflammatory drugs do not have the high risk of kidney and gastrointestinal damage like systemic drugs. Glucosamine and chondroitin products have limited effects on osteoarthritis pain. Intra-articular steroid injections are used safely when needed, although repeated doses every 3 months showed no pain improvement compared to placebo and were also associated with increased cartilage volume decline in the knee on MRI. Hyaluronic acid and hyaluronan polymer injections into the knee joint have also been proven effective. If injection is intended, ask about anticoagulant use and implement measures to minimize bleeding risk [1].

Joint replacement surgery is considered in selected patients with functional decline related to osteoarthritis who have failed conservative treatment. The elderly have higher post-surgical complication rates compared to younger patients but have similar quality of life benefits, emphasizing the need for individualized assessment with shared decision-making between patient and physician [1].

5.2. Chronic Low Back Pain

Chronic low back pain is very common in the elderly with estimated rates ranging from 10% to 20% in adults 65 years and older worldwide. Chronic low back pain is associated with poorer health perception, poorer quality of life, and depressive symptoms. Most chronic low back pain has no clear cause. A review of chronic pain in the elderly showed rates of back pain due to osteoarthritis, particularly in the lumbar or cervical region (approximately 65%). Chronic low back pain can be considered a common final phenotypic pathway resulting from several contributing factors, including spinal stenosis, hip osteoarthritis, sacroiliac joint pathology, leg length discrepancy, myofascial pain, poor coping ability, anxiety, and depression. Diagnosis must exclude infection, malignancy, and nerve root compression in patients with red flag symptoms. Clinical examination and imaging use to find causes of chronic low back pain should investigate pain sources including hip, sacroiliac joint, and vertebrae [1].

Treatment of chronic low back pain includes multiple therapeutic modalities to optimize function and begins with non-drug and rehabilitation therapies. Early and regular physical therapy should be recommended. Refer to spinal surgery specialists if there is any suspicion of central nervous injury or when neurological deficits correlate with X-ray images and/or conservative treatments do not provide significant improvement [1].

5.3. Crystal Arthritis: Gout and Pseudogout

Gout is a form of crystal arthritis characterized by inflammatory reaction to sodium urate in joints. It is the most common arthritis in the elderly and continues to increase, possibly due to the association between hyperuricemia with hypertension, metabolic syndrome, kidney failure, and diuretic use. Often considered a disease affecting middle-aged men, elderly-onset gout is also common and may present with distinct characteristics. Notably, women have higher gout rates at age 80. Unlike typical gout, initial gout flares in the elderly often present with tophi, uric acid accumulation in joints and skin. In contrast, podagra, painful swelling in the great toe joint, is less common in elderly gout. It may affect smaller hand joints and multiple joints simultaneously,

which may make distinguishing gout from rheumatoid arthritis in elderly patients more difficult. When diagnosing gout, osteoarthritis, rheumatoid arthritis, pseudogout, and infection should be kept in the differential diagnosis [1].

Gout diagnosis is usually clinical, based on characteristics of acute flares, although inflammatory markers and elevated blood uric acid are very useful. The gold standard for diagnosis remains identification of needle-shaped negatively birefringent monosodium urate crystals under polarized light microscopy of affected joint fluid. X-rays can often help support gout diagnosis, particularly erosive changes and bony overhangs with preserved joint space [1].

For gout flares, colchicine or corticosteroids are considered for treatment in the context of patient risks and comorbidities. Avoid indomethacin in the elderly. Intra-articular steroids are a viable treatment for flares in several joints with lower side effect risk compared to systemic steroids. Long-term prophylactic treatment includes lifestyle modifications and urate-lowering drugs in some cases. Patients should be counseled to reduce or eliminate alcohol, shellfish, and organ meats. Urate-lowering drugs are indicated for patients with more than two flares per year, kidney stones, or tophi or erosive changes on X-ray. Target uric acid level should be below 6 mg/dL, and initial choice of urate-lowering therapy should be allopurinol. In patients with chronic kidney disease, one may start allopurinol at the lowest dose and adjust to target uric acid level while monitoring adverse reactions. An alternative is febuxostat, a xanthine oxidase inhibitor, which may be associated with increased cardiovascular side effects based on data from a single clinical trial. When starting urate-lowering therapy, patients should take prophylactic low-dose corticosteroids or colchicine to prevent "mobilization flares," i.e., when starting urate-lowering therapy may trigger acute gout. Gout can usually be managed by the patient's primary care physician; however, referral to a rheumatologist should be considered if the patient continues to experience significant signs or symptoms of gout despite appropriate treatment, unclear source of hyperuricemia, difficulty achieving target blood uric acid, or multiple and/or severe side effects from drug urate-lowering therapy [1].

Similar to gout, calcium pyrophosphate deposition disease, also called pseudogout, is a form of crystal arthritis characterized by inflammatory reaction due to calcium pyrophosphate deposition in joint cartilage structures. Pseudogout has a prevalence rate of approximately 5% to 15% for adults over 60 years old. Age is a strong risk factor for pseudogout, and secondary causes include hypomagnesemia, hypercalcemia, hyperparathyroidism, and hemochromatosis. Acute pseudogout typically presents as episodic arthritis in knee, wrist, or hand joints, although axial joints may be affected. Like gout, definitive diagnosis of pseudogout includes identifying crystals under joint fluid microscopy; calcium pyrophosphate crystals appear as weakly positively birefringent rhomboid crystals under polarized light. X-rays are often very useful in supporting diagnosis when patients are symptomatic, as chondrocalcinosis is commonly seen, although this may be an incidental finding in asymptomatic patients. Treatment of pseudogout flares is similar to gout including using a course of steroids or colchicine. There are no targeted drugs to reduce occurrence of calcium pyrophosphate deposition flares, but remediable causes should be sought and addressed [1].

5.4. Rheumatoid Arthritis (RA)

RA is an autoimmune arthritis characterized by progressive damage to synovial joints and may include extra-articular manifestations. The prevalence of RA in adults over 60 years old is approximately 2%, and RA incidence peaks in the eighth decade of life. Elderly-onset RA (EORA), defined as RA onset after age 65, has some characteristic features, including equal gender distribution; involvement of larger joints such as shoulders and hips; higher rates of rheumatoid factor positivity. EORA may have a milder clinical course, although this is not always true. Patients typically present with pain and swelling of multiple joints with symmetric distribution [1].

RA diagnosis is based on history and clinical examination with blood tests and imaging used to confirm diagnosis. Look for extra-articular manifestations, including rheumatoid nodules, vasculitis,

and interstitial lung disease, as these manifestations signal worse prognosis. Blood tests include rheumatoid factor, anti-cyclic citrullinated peptide (CCP) antibodies, inflammatory markers, complete blood count, and comprehensive metabolic panel. Joint aspiration is not necessary for diagnosis but is very useful to help exclude crystal arthritis or infection. Classic X-ray signs of RA include joint space narrowing, osteopenia or periarticular osteoporosis, and erosions. There are no specific diagnostic criteria for EORA; however, American College of Rheumatology (ACR) and European League Against Rheumatism (EULAR) diagnostic criteria for RA can be used [1].

The foundation of RA treatment is disease-modifying antirheumatic drugs (DMARDs), used according to a treat-to-target approach, aimed at reducing disease progression and preventing joint deformity. Depending on current disease severity, patients are started on monotherapy or combination DMARDs, typically including methotrexate, hydroxychloroquine, sulfasalazine, and leflunomide. Biological therapies are usually used after non-biological DMARD trials and include different targets (e.g., tumor necrosis factor-alpha, interleukin-6, JAK, CD20). DMARDs must be closely monitored for side effects including atypical infections and reactivation (tuberculosis or viral hepatitis). Corticosteroids are sometimes used at low doses for short periods for active RA but should be avoided as long-term treatment. Cardiovascular events are the leading cause of death in RA patients, including elderly RA patients. A patient suspected of RA should be referred to a rheumatologist as soon as possible for early, aggressive disease management and monitoring [1].

5.5. Polymyalgia Rheumatica

Polymyalgia rheumatica (PMR) is a typical inflammatory disease associated with pain and morning stiffness in shoulders, upper arms, hips, neck, and trunk. It almost exclusively affects adults over 50 years old and has the highest incidence in the eighth to ninth decades of life with a prevalence of approximately 1% to 2% for adults over 50 years old. Women are affected at twice the rate of men. Patients may have symmetric polyarthritis in hands, wrists, and knees, making it difficult to distinguish PMR from RA. PMR is a clinical diagnosis, and ACR and EULAR have proposed classification criteria for PMR. Due to overlap with giant cell arteritis (GCA), all PMR patients should be screened for GCA. Laboratory studies typically show elevated inflammatory markers with negative autoantibodies. Imaging is not necessary for PMR diagnosis. The primary treatment for PMR is low-dose systemic glucocorticoids. Physical therapy is very useful for maintaining function in patients with joint stiffness and pain [1].

5.6. Giant Cell Arteritis (GCA)

GCA is a vasculitis affecting large and cranial arteries with the highest disease incidence at age 70. Its prevalence is estimated at 0.7%, with higher rates in women similar to PMR. Reportedly, 10% of PMR patients develop GCA. Symptoms include jaw claudication, visual changes, and dysphagia, and the dreaded consequence of untreated GCA is irreversible blindness. The gold standard for GCA diagnosis is temporal artery biopsy over at least 1 cm segment with multiple sites examined. MRI, PET/CT scan, and ultrasound can identify affected vessels but cannot accurately diagnose the disease. The primary treatment is high-dose systemic steroids, which should be started empirically even before confirming diagnosis by biopsy; the diagnostic value of biopsy remains high even when the sample is taken after starting steroids. The Food and Drug Administration recently approved the biological interleukin-6 inhibitor tocilizumab for GCA treatment, providing additional options beyond steroids. GCA needs to be evaluated and managed by rheumatologists and ophthalmologists. PMR can usually be managed by primary care physicians unless there are more atypical cases, such as incomplete response to steroids, unusual manifestations, or difficulty tapering steroids [1].

5.7. Fibromyalgia

Fibromyalgia, also called central pain syndrome, is characterized by increased pain sensitivity and often accompanied by fatigue, psychiatric disorders, sleep disorders, and other symptoms. It is a central dysregulation condition in pain processing leading to pain amplification,

overlapping with other chronic pain conditions (e.g., irritable bowel syndrome and chronic regional pain syndrome), although changes in peripheral pain processing are also involved . There is no single cause of fibromyalgia; it results from complex interaction of biopsychosocial factors. Estimated prevalence in the elderly is 2% to 4%, with women affected twice as much as men. Fibromyalgia diagnosis is clinical and follows 2011 ACR diagnostic survey criteria, where patients experience widespread pain accompanied by other symptoms including fatigue, depression, headaches, and cramps. Due to widespread pain, differential diagnosis of fibromyalgia is very broad and can be particularly difficult in elderly patients with multiple pathologies. Carefully look for other causes of pain while understanding that fibromyalgia often coexists in the context of other rheumatic diseases (systemic lupus erythematosus, osteoarthritis, PMR, crystal arthritis, RA), muscle disease, hypothyroidism, and vitamin D deficiency [1].

Although drug therapies may not improve function, they may improve pain, mood, and sleep. The drug group proving most effective is antidepressants, and it is suspected this is due to pain modulation effects of increasing norepinephrine and serotonin in central pain inhibitory pathways. Duloxetine and milnacipran, both serotonin-norepinephrine reuptake inhibitors, are FDA-approved for reducing fibromyalgia-related pain. However, side effects may include sedation, orthostatic hypotension, and urinary retention. Pregabalin may also help improve pain symptoms and may be considered, starting with low evening doses and gradually increasing. Although tramadol and tricyclic antidepressants may help reduce symptoms, their use in the elderly is not recommended due to cardiovascular and urinary side effects. Fibromyalgia can be effectively managed by primary care physicians with a multidisciplinary, multimodal approach. Rheumatologists may be referred if there is suspicion of underlying arthritis or autoimmune disease [1].

6. CONCLUSION

Chronic musculoskeletal pain in the elderly is common, leading to significant disability and costs for individuals and society. Aging pain has unique challenges in diagnosis and treatment; however, it is a controllable condition using multi-target, multimodal, and multidisciplinary approaches. There remain gaps in the literature for better understanding and treating pain in the elderly, including expanding the evidence base for clinical trials of non-drug and drug treatments for musculoskeletal pain in the elderly, as they are often excluded from these trials. Another issue is access to evidence-based non-drug therapies. For example, cost and accessibility of physical activity programs or mind-body therapies are significant barriers to program participation in the elderly. Taking time to understand the pain experience of elderly patients (including various domains of sleep, social isolation, fatigue) through comprehensive assessment/evaluation will create the foundation for effective multimodal treatment plans and establish trustworthy, sustainable therapeutic relationships. Listening to patients and their responses to therapies over time is the most effective tool [1].

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