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Clinical Review

SAFELY MANAGING ACUTE OSTEOARTHRITIS IN THE EMERGENCY DEPARTMENT: AN EVIDENCE-BASED REVIEW

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☐ **Abstract—Background: Joint pain caused by acute osteoarthritis (OA) is a common finding in the emergency department. Patients with OA often have debilitating pain that limits their function and ability to complete their activities of daily living. In addition, OA has been associated with a high percentage of arthritis-related hospital admissions and an increased risk of all-cause mortality. Safely managing OA symptoms in these patients can present many challenges to the emergency provider. Objectives: We review the risks and benefits of available treatment options for acute OA-related pain in the emergency department. In addition, evidence-based recommendations will be made for safely managing pain and disability associated with OA in patients with comorbidities, including cardiovascular disease, renal insufficiency, and risk factors for gastrointestinal bleeding. Discussion: Commonly used treatments for OA include acetaminophen, oral nonsteroidal anti-inflammatory drugs, and opioids, each with varying degrees of efficacy and risk depending on the patient's underlying comorbidities. Effective alternative therapies, such as topical preparations, intra-articular corticosteroid injections, bracing, and rehabilitation are likely underused in this setting. Conclusions: Emergency providers should be aware of the risks and benefits of all treatment options available for acute OA pain, including oral medications, topical preparations, corticosteroid injections, bracing, and physical therapy. Published by Elsevier Inc.**

☐ **Keywords—arthralgia; arthritis; nonsteroidal anti-inflammatory agents; osteoarthritis**

INTRODUCTION

Osteoarthritis (OA) is a common problem, the incidence of which is increasing every day (1). By 2030, as much as 25% of the adult population is expected to have self-reported or physician-diagnosed arthritis (2). The prevalence of OA in the ambulatory care setting is approximately 3500 per 100,000 visits, where patients present most commonly with pain related to their knee, hip, and shoulder OA (3). The primary objective of the emergency provider is to rule out critical diagnoses, such as septic arthritis, fractures, and dislocations. Once this has been accomplished, however, there is still much to be done! Quality of life for this population can be dismal because of their pain (4,5). Beyond that, OA of the knee and hip joints in an ambulating population can predispose them to falls, potentially leading to intracranial hemorrhage, fractures, and other emergency conditions (6–8). How is pain and disability best managed in patients presenting with an acute

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exacerbation of their OA from the perspective of the emergency clinician?

This article will provide evidence-based recommendations to help relieve pain and suffering, minimize disability, and prevent future injury in patients presenting to the emergency department (ED) with an acute exacerbation of OA.

EPIDEMIOLOGY AND PATHOPHYSIOLOGY

There has been a significant increase in the prevalence of OA over the last 20 years, often attributed to the aging population and obesity (9). OA can be found in up to 13.9% of adults >25 years of age and 33.6% of adults ≥65 years of age (1). Perhaps more relevant in the ED, patients with OA are more likely to be admitted, have longer hospital stays, and be readmitted when compared to a similar population without OA (10). Patients with OA also have a higher risk of all-cause mortality compared to the general population and an increased level of risk that is independent of treatment complications, such as gastrointestinal (GI) bleeding from the use of nonsteroidal anti-inflammatory drugs (NSAIDs) (11,12).

The origin and progression of OA is multifactorial, including genetic predisposition, previous injuries to the joint, and other biomechanical factors (13). Many definitions for OA exist and are based on pathologic, clinical, or radiographic features, with radiographic being the most prevalent. The specifics of these classifications are complex and beyond the scope of this article. In general, OA represents degenerative changes to articular cartilage, synovium, subchondral bone, and other structures. Not surprisingly, OA symptom severity often correlates with the degree of radiographic abnormality (14,15).

An acute flare of OA commonly presents as increased pain, often associated with joint swelling, stiffness, and decreased range of motion. An acute increase in OA-related pain might be the result of trauma, overuse, or crystal formation. Many patients claim that weather changes influence their OA pain, which is supported by limited evidence (16,17).

The pathogenesis of pain in OA is complex and not clearly understood. Hyaline cartilage is avascular and not innervated by nociceptive receptors, so this is unlikely to be the source of symptoms. The sensation of discomfort is much more likely to come from synovitis, subchondral bone changes, and osteophyte formation; however, OA-related pain can be elicited over apparently normal tissue (18,19). This would indicate the possibility of central modulation of nociceptive input from the region around an arthritic joint (19).

Despite this limited understanding, several treatment options are available to the emergency provider that have shown efficacy in safely managing pain, function, and disability in patients with OA.

DISCUSSION

Oral Pharmaceutical Therapy for Osteoarthritis

Acetaminophen. A common initial choice in the management of patients with OA, acetaminophen (APAP) is thought to cause pain relief through the inhibition of prostaglandin synthesis in the central nervous system and peripheral blockade of pain impulse generation (20).

APAP has previously shown efficacy superior to placebo in treating hip and knee OA, with a number needed to treat somewhere between 4 and 16, but not superior to NSAIDs in a 2006 Cochrane review (21). Another more recent review found that APAP is not helpful in the treatment of low back pain and provides minimal short-term benefit in patients with OA (22). In 2013, because of a lack of significant benefit over placebo, the American Academy of Orthopedic Surgeons (AAOS) downgraded their guidance on the use of APAP in patients with OA of the knee to inconclusive, and no longer recommend for or against its use (23,24).

There is also evidence that unintentional overdoses of APAP occur in the elderly population and can ultimately lead to multiorgan failure and death (25). In fact, in 2011, Johnson and Johnson's McNeil Division (the manufacturer of Tylenol) changed the recommended maximum dose from 4000 mg per day to 3000 mg per day because of concerns regarding combination medications and unintentional overdose (26). While APAP is an option for the treatment of OA, it is unlikely to be as effective as other available alternatives and is not without risk.

Nonsteroidal anti-inflammatory drugs. NSAIDs provide analgesia and reduce inflammation by preventing the synthesis of thromboxanes and prostaglandins through inhibition of the cyclo-oxygenase-1 (COX-1) and COX-2 enzymes (27). These medications are generally divided into two categories: nonselective inhibitors and those that primarily inhibit the COX-2 enzyme.

The efficacy of NSAIDs in patients with OA has been clearly shown, making NSAIDs one of the mainstays of treatment with a number needed to treat between 1.6 and 3 (28,29). Nonselective NSAIDs, such as ibuprofen and naproxen, as well as COX-2 selective NSAIDs, including meloxicam and celecoxib, provide improvement in pain, function, and mobility (30). There is no evidence that the short- or long-term use of NSAIDs leads to significant changes in the progression of OA (31,32). COX-2 inhibitors are as effective as nonselective