Conservative management strategies to mitigate the increasing burden of osteoarthritis on the healthcare system

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ABSTRACT

In Canada, the incidence is expected to increase in the upcoming years due to changing population demographics. As such, researchers have recently started to focus on conservative management strategies. This article will review the current evidence available for the effectiveness of self-management and therapeutic exercise programs in individuals with hip and knee OA, as well as discuss the potential for mitigating rising healthcare costs in this population.

INTRODUCTION

Osteoarthritis (OA) is the most common form of arthritis, involving structural changes in the joint as well as inflammation.¹ There are currently over 4 million Canadians living with OA, representing 13% of the population.² In the coming years, the proportion of affected individuals is expected to increase due to an aging population, which will result in more people developing OA.^{2,3} Moreover, it has been predicted that 25% of the Canadian population will be diagnosed with OA by the year 2040.² This increase will place a large financial burden on the Canadian healthcare system as these individuals seek continual care. A recent cohort study in the United States found that individuals with arthritis or joint pain accounted for higher total healthcare expenditures than those who are not affected.⁴

A recent scoping review found that the key factor in determining an OA patient's self-perceived need for healthcare services was their symptom control.⁵ This finding is further supported in the Arthritis Alliance of Canada 2011 report, which predicted that the development of adequate pain management strategies for OA would result in a cumulative savings of \$488 billion over the next 30 years.² Self-management patient education and therapeutic exercise interventions may offer clinically significant pain and symptomatic relief for the patient while allowing providers to decrease costs of care delivery, resulting in a more efficient healthcare system.

GUIDELINES

Many organizations from around the world have published guidelines for the management of hip and knee OA, most of which recommend that patients participate in self-management educational programs, including weight loss if overweight, and engage in regular aerobic, resistance, and flexibility exercises.⁶⁻¹⁰ One such

guideline, published by the European League Against Rheumatism (EULAR), recommends that every patient with hip or knee OA should receive a core non-pharmacological intervention consisting of education, self-management, weight loss if overweight, and regular exercise.⁸ These interventions represent a patient-centred and multidisciplinary approach, utilizing the main principles of non-pharmacological management.⁸ The reduced need for clinical interaction with individuals who implement these patient-centric interventions may provide a cost-effective alternative for OA pain and disability management, with the potential to reduce the economic burden on the healthcare system. However, little is known about how these treatment guidelines influence patient outcomes and healthcare expenditures.

REVIEW OF EVIDENCE

While little is known regarding the effectiveness of comprehensive management programs like that recommended by EULAR, key elements of these guidelines have been tested experimentally. Self-management strategies and therapeutic exercise have been proposed as conservative interventions for the treatment of OA-related pain and disability, and have been studied extensively.¹¹⁻¹⁷ Self-management programs for OA comprise a package of interventions specifically targeted at patient education and behaviour modification, which encourage people with chronic disease to take an active role in the management of their own condition.¹⁴ Weight loss is often considered its own form of OA intervention, but for the purposes of this review, will be considered as part of a broader self-management category.

In 2014, the Cochrane Library published a review of randomized controlled trials assessing the effectiveness of self-management education programs.¹⁴ Twenty-nine studies were included in the review, which found low to moderate quality evidence for self-management programs.¹⁴ However, when compared to usual care for individuals with OA, these interventions may improve self-management skills, pain, function, and symptoms. It was concluded interventions of this nature are unlikely to cause harm to patients, and that more research is needed on other models of self-management education programs.¹⁴

Weight loss is also recommended as a basic self-management tenet for individuals with osteoarthritis.⁸ A systematic review of 454 patients with diagnosed knee OA in four randomized control trials found that disability can be significantly improved with weight loss of greater than 5% of total body weight over a 20-week

period.¹³ However, only a small pooled effect size for improvement in pain was found with a reduction in weight.¹³ A particular strength of this review was the inclusion of both dietary and exercise interventions to reduce weight, highlighting the potential to incorporate patient preference into the shared decision making process.

Therapeutic exercise has also been the focus of much clinical research and is defined as a range of targeted physical activities that directly aim to improve muscle strength, joint range of motion, and aerobic fitness.^{15,16} The Cochrane Library published a review of fifty-four randomized controlled trials examining the effectiveness of land-based therapeutic exercise in individuals with knee OA.¹⁵ Moderate to high quality evidence suggests that land-based exercise provides sustained benefit in pain and physical function for up to 6 months following cessation of treatment.¹⁵ These findings are comparable to reported improvements in the same outcomes following the use of non-steroidal anti-inflammatory drugs.¹⁵ Furthermore, a similar review for individuals with hip OA found that land-based therapeutic exercise improved pain and physical function levels immediately after treatment, and improvements were sustained for three to six months.¹⁶ It is important to note that therapeutic exercise for individuals with hip or knee OA was unlikely to cause any adverse events, and that further research is needed to determine optimal dosage parameters for exercise.^{15,16}

In addition to land-based exercise, aquatic exercise interventions may provide symptomatic relief of OA. A review of aquatic exercise interventions for people with OA of the hip or knee was recently published by the Cochrane Library.¹² This review included 13 trials (1190 participants) and found moderate quality evidence that aquatic exercise provides small, but clinically relevant effects on pain, disability, and quality of life, with minimal risk of any adverse events.¹² With both land-based and aquatic exercise shown to produce clinically significant outcomes for individuals with OA, patients may select a more preferable program to manage their OA.

There is little consensus on the optimal frequency and duration of self-management education and exercise programs, as more research examining these interventions is needed. Moreover, this article limited its focus to a discussion of self-management and therapeutic exercise effectiveness individually but there is growing evidence examining these treatments in combination or as part of a larger multimodal intervention.^{18,19} There is potential for multimodal conservative and pharmacological interventions, tailored to the individual patient, to provide effective symptomatic and functional improvement.

CONCLUSION

Due to the increasing number of Canadians with OA and subsequent burden on the healthcare system, it is important for practitioners to be aware of interventions that have the potential to reduce costs while simultaneously improving patient health. The purpose of this review was to highlight the latest evidence on self-management and therapeutic exercise strategies for patients with OA. These interventions were found to provide small to moderate improvements in pain levels and physical functioning and

were unlikely to cause harm in these individuals.

After review of the available high-quality evidence, it is recommended that clinicians consider referral of patients to self-management and exercise programs to manage the symptoms of OA in addition to standard care. Treatment approaches such as this require collaboration from a multidisciplinary team and highlight the need for effective communication within the patient's entire healthcare team. These interventions can provide meaningful results to patients with OA and may help reduce the costly burden of OA on the healthcare system. It is hoped that this article provides clinicians with a review of the most up-to-date evidence on approaches to the management of OA, while aiming to stimulate thought and further research in the development of efficacious and cost-effective OA management strategies.

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