

COMPARISON OF PHYSICAL THERAPY VERSUS GLUCOCORTICOID INJECTION FOR OSTEOARTHRITIS IN THE KNEE

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ABSTRACT

Knee osteoarthritis (OA) affects 12.4 million individuals over 65, with a higher prevalence in women. Primary OA, characterized by gradual cartilage loss, and secondary OA, often associated with conditions like rheumatoid arthritis or post-traumatic causes, present distinct challenges. Physical therapy, a recommended non-pharmacological treatment, aims to minimize pain, enhance joint function, and improve mobility cost-effectively. Various organizations endorse exercise, weight loss, and education as first-line therapies. Exercise, particularly aerobic and quadriceps-specific activities, proves beneficial for knee OA, aligning with global recommendations. Glucocorticoid injections, demonstrating efficacy in reducing pain, offer an alternative but raise concerns about cartilage toxicity. A randomized trial comparing physical therapy to glucocorticoid injections emphasizes the need for personalized treatment strategies. While physical therapy focuses on long-term benefits, intramuscular glucocorticoid injections provide rapid relief, suggesting a potential role for combined approaches based on individual needs. Individualized care remains paramount in the management of knee OA.

INTRODUCTION

Knee osteoarthritis affects 12.4 million people over 65 (33.6%), making it a relatively common ailment. It's noteworthy to notice that women are more affected and burdened by osteoarthritis of the knee than men are.^[1] Degenerative joint disease, commonly known as osteoarthritis (OA) of the knee, is mostly brought on by wear and strain as well as a slow loss of articular cartilage. It is more likely to affect the elderly.^[2] The 1957 introduction of the Kellgren–Lawrence (KL) method made it possible to categorize illness severity according on radiographic results.^[3] Its main feature is the gradual loss and deterioration of articular cartilage, together with changes to the structure and function of the joints. Changes in the meniscus, periarticular ligaments, subchondral bone, and synovium are further pathological indicators.^[4]

ETIOLOGY

Depending on what caused it, osteoarthritis in the knee might fall into one of two categories: primary or secondary. Primary osteoarthritis is arthritic deterioration with no apparent underlying cause. One of the two primary reasons of secondary osteoarthritis is either an abnormal distribution of force across the joint, as in post-

traumatic causes, or abnormal articular cartilage, as in rheumatoid arthritis (RA).^[5]

Additional causes of secondary osteoarthritis in the knee^[6]

Aseptic osteonecrosis; post-traumatic; congenital/malformation; malposition (varus/valgus); rickets; hemochromatosis; chondrocalcinosis; osteonosis; endocrine disorders: amyloidosis, hyperparathyroidism, hyperuricemia; aseptic osteonecrosis.

SYMPTOMS

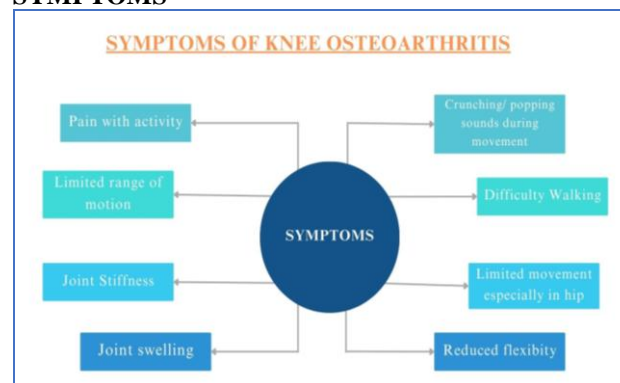


Figure 1: Symptoms of Knee osteoarthritis.

RISK FACTORS

The factors that increase the risk of osteoarthritis (OA) can be categorised into two types.^[7]

Modifiable

- Articular trauma
- Occupation – prolonged standing and repetitive knee bending
- Muscle weakness or imbalance
- Weight
- Health – metabolic syndrome

Non-modifiable

- Gender - females more common than males
- Age
- Genetics
- Race.^[2]

PHYSICAL THERAPY

Introduction

- The most often suggested non-pharmacological and nonsurgical treatment for musculoskeletal conditions, especially osteoarthritis, is physical therapy.^[8]
- Physical treatment is cost-effective, efficient, and has minimal to no adverse effects.^[8]

Goals

The goals of physical therapy for OA patients are to minimize pain, enhance joint function, as well as improve their physical condition so they can become sufficiently mobile to engage in activities of daily life.^[8]

Physical therapies for osteoarthritis

• Prevention and treatment

Previous research has shown that physical therapy is quite beneficial for osteoarthritis.

When opposed to surgery and pharmaceutical interventions, physical therapy, which is represented by regular exercise, has numerous advantages. These include ease of application, low costs, and few unwanted effects. Therefore, top worldwide organizations and authorities have all unanimously advocated physical therapy as a crucial therapeutic option for OA.^[8]

• Non-pharmacological strategies

Current clinical practice guidelines state that exercise, weight loss (for patients who are overweight or obese), education, and self-management should be the primary line of treatment for knee OA.^[9]

We see these procedures as the cornerstone of knee OA therapy because of their shown capacity to improve patient quality of life, reduce pain, and enhance overall joint function.^[9]

• Exercise

It is well established that physical activity treatment and exercise help people with knee OA function better and experience less symptoms.^[9]

Two days a week of moderate-to-vigorous physical activity or 150 minutes a week of moderate-to-vigorous aerobic exercise have been shown to be beneficial for individuals with preexisting knee OA.

If we were to translate these two forms of physical activity into step counts, aerobic workouts would require approximately 7500 steps per day, while moderate-to-vigorous physical activity would require 5750 steps per day.

Furthermore, exercises designed specifically for the quadriceps have been demonstrated to lessen pain when compared to general lower-limb activities, as has exercising under supervision at least three times per week.

However, the existing guidelines that favor one kind of exercise over another are mostly derived from professional perspectives.

There are several exercise options for knee OA, independent of function or pain.^[9]

Suggestions from Organisation

- Physiotherapists and other medical professionals should concentrate on patient-oriented rehabilitation, taking into account the patient's preferences and availability to exercise equipment, in order to improve rehabilitation. The National Centre for Quality Care and Health (NICE)
- Suggests aerobic fitness and strengthening activities; the Osteoarthritis Research Society International (OARSI)
- Suggests two forms of structured land-based exercise programmes:
- Mind-body exercises like yoga or tai chi, or
- Mind-body exercises like cardio, balance training, and neuromuscular activity; the American College of Rheumatology (ACR)
- Suggests resistance, swimming, and/or aerobic exercise; the Ottawa Panel.
- Mind-body exercises (Hatha yoga, Tai Chi Qigong, sun style Tai Chi), strengthening exercises alone or in conjunction with other types of exercise (coordination, balance, functional exercises), and aerobic exercises alone or in conjunction with strengthening exercises are recommended by the European League against Rheumatism (EULAR).^[9]
- Encourages pacing activities and exercises as a means of treating osteoarthritis in the knee. Extensive studies have demonstrated the benefits of non-perioperative therapeutic exercise programs on pain, physical function, and overall quality of life in

individuals with osteoarthritis (OA). Additionally, these regimens have therapeutic significance^[9]

- When recommending a home exercise programme, the patient's preferences and the clinical evaluation should be taken into consideration when determining the kind and quantity of exercise to be done.^[9]
- Education is essential when recommending an exercise regimen. People with knee OA hardly ever use the majority of existing exercise regimens, mostly because of patient attitudes, socioeconomic barriers, movement anxiety, low self-esteem, lack of time to fit the exercise regimen into daily life, and exacerbation of pain during early treatment^[9]

Glucocorticoid Injection

Introduction

Knee OA is the most common affected joint in osteoarthritis (OA), which is a primary cause of disability.^[10] It has been demonstrated that corticosteroids are cytotoxic to cartilage in both human and animal *in vivo* investigations.^[11] The possibility of direct cartilage toxicity and septic arthritis is eliminated with IM treatment. When administered for rheumatoid arthritis, intramuscular glucocorticoids have been shown to have a positive impact on musculoskeletal discomfort. This effect was first observed in individuals with rotator cuff illnesses.^[12]

METHOD

We conducted a randomized experiment in the primary care setting of the U.S. Military Health System to compare glucocorticoid injections with physical therapy. Individuals suffering from osteoarthritis in one or both knees were randomized 1:1 to receive either physical therapy or an Timed Up and Go test duration, the Alternate Step exam duration, and the Global Rating of Change scale score were the secondary outcomes that were assessed one year later.^[13]

EFFECTS

- One frequent degenerative ailment that has a major influence on one's health and finances is osteoarthritis (OA) of the knee. One potential treatment option for symptoms is intraarticular (IA) injections of corticosteroids (GC), but opinions on these injections' efficacy and safety are divided.
- Giving glucocorticoids to patients with knee OA may be possible by intramuscular (IM) injection, which is easier to give than intraarterial (IA) injection and eliminates the risk of damaging effects on cartilage and septic arthritis. Intramuscular glucocorticoid injections have been shown to be beneficial in lowering pain in a number of musculoskeletal disorders, such as rotator cuff disease and hand OA.^[10]

COMPARISON OF PHYSICAL THERAPY VERSUS GLUCOCORTICOID INJECTION

- Physical therapy is the most commonly recommended non-pharmacological and non-

surgical treatment for musculoskeletal problems, including osteoarthritis (OA).^[15] The major goals of physical therapy for OA are pain reduction, improved joint function, and physical state improvement. As a result, the patient can resume sufficient movement for daily tasks. Physical treatment is quite helpful for osteoarthritis, according to earlier study.^[15] Exercise treatment and physical activity are well established to alleviate symptoms and improve physical function in individuals with osteoarthritis in the knee.^[16] Before the patient completed actions that were intended to be reinforced, the physical therapist would usually employ hands-on, manual ways to help the patient execute the motions with little to no discomfort.

- If the patient was unable to completely extend or flex the knee, or if such motions were uncomfortable, a physical therapist would, for instance, use a hands-on, passive mobilizing approach to move the knee repeatedly to reduce stiffness while adjusting the mechanics of the technique to minimize discomfort. Following that, the patient would aggressively move their knees in the same way on many occasions. Similarly, if the patient's muscles were tight, the physical therapist would physically stretch the muscles surrounding the knee before the patient completed the same exercises. a technique that starts with hands-on, passive movement and ends with strengthening exercises.^[17]
- Randomized controlled studies (RCTs) have shown that intra-articular (IA) injections of glucocorticoids (GCs) relieve pain, improve mobility, and improve quality of life in individuals with osteoarthritis (OA).^[16] Orthopedic doctors or rheumatologists delivered the intra-articular injections in compliance with local protocols. Investigators for the trial included an orthopedic specialist who performed injections. Injections of 1 ml of 40 mg/ml triamcinolone acetonide and 7 ml of 1% lidocaine were given to patients using sterile method in one or both knees. In order to discuss the current treatment plan and if more glucocorticoid injections were required, the same medical personnel reexamined the patients after four and nine months.
- Patients may get up to three injections throughout the duration of the one-year study, at the doctor's discretion.^[17] Based on current research, patients with osteoarthritis (OA) in the knee who get physical therapy and non-pharmacologic treatment, including exercise, have considerably better clinical results. These benefits may exceed those obtained with intra-articular or pharmacological therapy, which can be very expensive and dangerous. This study investigated the associations between the kind, timing, and dose of physical therapy and the use of intra-articular corticosteroids in patients with incident knee OA using data from a large retrospective claims database. If physical treatment was effective, we reasoned, then the use of intra-

articular therapies must be an indication that the pain from osteoarthritis was worsening.

CONCLUSION

Physical therapy is a non-invasive, all-encompassing method with an emphasis on mobility improvement, strength training, and rehabilitation. It may be used for conditions that need for steady treatment and slow development since it places an emphasis on long-term advantages. Intramuscular glucocorticoids, on the other hand, provide targeted relief from acute pain and inflammation, which leads to quicker symptomatic resolution. However, its advantages could not endure very long. It's important to take into account the specific demands of each patient, the type of their ailment, and the intended goals when comparing physical therapy with intramuscular glucocorticoid injection as therapies. A comprehensive plan integrating the two therapies may be necessary in some situations, emphasizing the value of individualized care.

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