



Risk Factors, Treatment Options and Improved Outcomes of Knee Osteoarthritis

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DESCRIPTION

Knee osteoarthritis, a degenerative joint condition characterized by the degeneration of tissues and changes in bone structure, represents a significant burden on millions of individuals worldwide. As one of the most common forms of arthritis, knee osteoarthritis affects people of all ages leading to pain, stiffness, and functional limitations that can impact quality of life and independence. Knee osteoarthritis results from a complex interplay of biomechanical, genetic, and environmental factors that contribute to the gradual deterioration of the knee joint. Moreover, changes in bone structure, such as bone spurs and cysts, may develop in response to osteoarthritic changes, further exacerbating symptoms and impairing joint function.

Several risk factors increase the probability of developing knee osteoarthritis, including age, obesity, previous joint injury or surgery, and genetic predisposition. Aging is a primary risk factor for osteoarthritis, as cartilage tends to lose elasticity with age, leading to increased susceptibility to joint degeneration. Obesity also plays a significant role, as excess body weight places added stress on weight-bearing joints such as the knees, accelerating cartilage breakdown and worsening symptoms. Additionally, individuals with a history of knee injury or trauma, such as ligament tears or meniscal injuries, are at higher risk for developing osteoarthritis later in life due to altered joint mechanics and increased joint instability.

Diagnosing knee osteoarthritis typically involves a combination of clinical evaluation, imaging studies, and laboratory tests to assess symptoms, joint function, and disease severity. Physical examination may reveal joint tenderness, swelling, and crepitus (grating or cracking sensations) upon movement, indicative of cartilage damage and inflammation. Imaging modalities such as X-rays, Magnetic Resonance Imaging (MRI), and Computed Tomography (CT) scans provide detailed visualization of the knee joint, allowing healthcare providers to assess the extent of cartilage loss, bone spurs, and other structural abnormalities. Additionally, laboratory tests such as blood tests and joint fluid

analysis may be performed to rule out other conditions and assess for signs of inflammation.

Treatment options for knee osteoarthritis aim to alleviate pain, improve joint function, and enhance quality of life through a combination of conservative measures, lifestyle modifications and, in some cases, surgical intervention. A conservative treatment such as exercise therapy, weight management, and physical therapy plays an essential role in managing symptoms and managing disease progression. Strengthening exercises, range-of-motion exercises, and low-impact aerobics activities helps to improve muscle strength, joint stability, and flexibility, reducing pain and enhancing mobility in individuals with knee osteoarthritis. Moreover, assistive devices such as braces, orthotics, and walking aids may be recommended to remove the affected joint and reduce mechanical stress during weight-bearing activities.

Furthermore, pain management techniques such as Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), acetaminophen, and corticosteroid injections may be prescribed to alleviate pain and inflammation in individuals with knee osteoarthritis. NSAIDs help to reduce pain and swelling by inhibiting inflammatory pathways, while acetaminophen provides analgesic effects without anti-inflammatory properties. Corticosteroid injections deliver potent anti-inflammatory medication directly into the knee joint, providing temporary relief from pain and swelling for individuals with moderate to severe symptoms. However, it is important to use caution with long-term use of NSAIDs and corticosteroids due to potential side effects such as gastrointestinal bleeding, cardiovascular events, and joint damage. In some cases where conservative treatments are ineffective in relieving symptoms and improving function, surgical intervention may be considered to repair or replace the damaged knee joint. Arthroscopic surgery, a minimally invasive procedure, may be performed to remove loose fragments of cartilage, smooth out rough surfaces, or repair torn ligaments in the knee joint.

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Received: 01-Mar-2024, Manuscript No. JPMME-24-25683; **Editor assigned:** 04-Mar-2024, Pre QC No. JPMME-24-25683 (PQ); **Reviewed:** 18-Mar-2024, QC No. JPMME-24-25683; **Revised:** 26-Mar-2024, Manuscript No. JPMME-24-25683 (R); **Published:** 04-Apr-2024, DOI: 10.35248/2684-1320.24.10.265.

Citation: Eirikssone H (2024) Risk Factors, Treatment Options and Improved Outcomes of Knee Osteoarthritis. J Pain Manage Med.10:265.

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