

HIP OSTEOATHRITIS IN WOMEN

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Abstract

The hip bone is the body's second largest weight-bearing joint (after the knee) and is a common site for OA. Hip osteoarthritis can seriously affect mobility, with subsequent physical impairment that can ultimately reduce activities of daily living. Studies have shown that osteoarthritis affected women more than men. Differences in etiology as regard anatomy, kinematics ,hormones and obesity exist. Treatment outcome particularly in operative management also exist. This review focus on these gender differences as a precursor to further study in this area.

Keywords: Hip, Osteoarthritis, Women, Treatment, Total hip athroplasty

Introduction

Osteoarthritis (OA) is define as a heterogeneous group of conditions that lead to joint symptoms and signs which are associated with defective integrity of articular cartilage, in addition to related changes in the underlying bone at the joint margins.(Altman R, Asch E, Bloch D, et al. 1986).It is also known as “wear-and-tear” arthritis. It is a progressive degenerative joint disease primarily affecting the articular cartilage, however other structures of the joint also suffers. Symptoms of osteoarthritis include; pain, joint stiffness, joint swelling, tenderness, decreased range of motion, and crepitus. Osteoarthritis is the most common form of arthritis and a leading cause of disability worldwide, largely due to pain, which is the primary symptom of the disease. It is a significant public health problem due to its major impact on disability and associated morbidities in the elderly

There are two types of OA, primary and secondary OA. Primary osteoarthritis is mostly related to aging but idiopathic in origin while secondary osteoarthritis develops as a result of a defined disorder affecting the joint articular surface. Primary OA (also termed idiopathic), generally is a diagnosis of exclusion and is believed to account for the majority of all hip OA. Conditions such as osteonecrosis, trauma, sepsis and certain conditions such as congenital hip disease and slipped capital femoral epiphysis are common causes of secondary hip OA.

The hip is the body's second largest weight-bearing joint (after the knee) and is a common site for OA. Hip osteoarthritis can seriously affect mobility, with subsequent physical impairment that can ultimately reduce activities of daily living.Osteoarthritis usually starts in people over the age of 45 and is more common in women than men. Studies have shown that osteoarthritis is expressed differently in women than in men. Experts believe women tend to get more severe osteoarthritis than men. The prevalence (proportion of patients in the population dependent on the incidence and duration of the disease) and incidence (number of new patients in relation to the number of vulnerable people that can become ill from particular disease within a certain population over a given period) of primary hip OA increases with age. Studies have shown that hip OA is epidemiologically distinguishable from OA affecting other joints. The prevalence of hip OA is about 3% to 6% in the Caucasian population and has not changed in the past four decades. In contrast, studies in Asian, black, and East Indian populations indicate a very low prevalence of hip OA. Studies have shown that incident of hip OA is higher in female gender compare to male gender.

Hip Joint Anatomy: An Overview

The hip joint also known as the acetabulofemoral joint is a ball and socket joint. The joint is formed by an articulation between the pelvic acetabulum and the head of the femur. It plays a primary role in supporting the body weight in

both the static and dynamic position. The uniqueness of the hip allows it to be extremely stable as it's primarily design for weight bearing. The weight of the body of a human being is transmitted through the hip joint to the lower extremity. It's a multiaxial joint and permits a wide range of motion which include; extension, flexion, abduction, adduction, internal rotation, external rotation, and circumduction.

The hip joint is a synovial joint formed by the articulation of the rounded head of the femur and the cup-like acetabulum of the pelvis. Both joint surfaces are covered with a strong lubricated layer called articular hyaline cartilage. The hip joint is enclosed by a strong fibrous capsule and lined internally by synovial membrane. This capsule is remarkably thicker anterosuperiorly as it is area of maximal stress. This strong but loose fibrous capsule of the hip joint permits the hip joint to have the second largest range of movement and still support the weight of the upper body. The ligaments of the hip can be classified into two namely; the intracapsular ligaments and the capsular ligaments. The intracapsular ligaments of the hip joint include the ligament of the head of the femur and the transverse ligament of the acetabulum while the capsular ligaments include ischiofemoral, pubofemoral and iliofemoral ligaments. The hip joint gains its major vascular supply from the medial and lateral circumflex femoral arteries while the foveal artery and the superior /inferior gluteal artery provides some additional blood supply. The joint is innervated by sciatic, obturator and femoral nerves. The movement that occur in the hip joint are; Extension (performed by gluteus maximus, semimembranosus, semitendinosus and biceps femoris), Flexion (performed by iliopsoas, sartorius, rectus femoris and pectinus), lateral rotation (performed by biceps femoris, gluteus maximus, piriformis, assisted by obturators, gemelli and quadratus), medial rotation (performed by anterior fiber of gluteus medius and gluteus minimus, tensor fascia latae), abduction (performed by gluteus medius, gluteus minimus, tensor fascia latae and piriformis) and adduction (performed by adductor longus, magnus, and brevis, pectineus and gracilis).

Etiology of hip osteoarthritis in women

Studies on the differences in the presentation and causes of hip OA in women compared to men has not been well studied. Reasons that have been associated with the development and also the presentation of hip OA in female gender compared to the male include anatomic differences, kinematics difference, hormonal issues and obesity. Research have shown that joint hypermobility which is higher in women compare to men have not been found to be associated with hip osteoarthritis in the former.

Generally speaking, the female skeleton is not as massive as the male skeleton. One major difference in the anatomical structure that can cause a difference in the development of hip OA is the volume of the cartilage. Cartilage density is higher in men compare to women. Overtime, women seems to have cartilage loss more than their men counterpart, a situation which has been linked to higher incidence of women OA though not sufficiently proven. Research has also shown that men had larger hip Joint space width (JSW) when compare to women and a significant decline in JSW with age also seen in women with no significant change in JSW seen in men. In the sex definition of hip OA, this variation in the hip JSW has a significant role in the narrowing of the joint space seen in hip OA. In the gait kinetic and kinematic of hip OA, women with OA have more deficits in the peak hip adduction moment, which is balanced by the hip abductors while Men have more deficits in the peak hip external rotation moment, which is balanced by muscles that internally rotate the hip during midstance. This difference made gait adaptation in symptomatic women with hip OA different from men particularly regarding the role of hip abductors. The incidence of OA in women and men from age 50 and above is higher in women compare to men. Coincidentally, this is the age of menopause in female.

Hormonal differences between men and women may play a role in the development of osteoarthritis. Studies have shown that OA is related to estrogen levels. A study found a high female to male ratio of 10:1 for OA, with a peak at 50 years of age. There are observations that articular chondrocytes have functional estrogen receptors and that estrogen can up regulate proteoglycan synthesis, this has further cemented the scientific plausibility for direct benefits of estrogens on articular cartilage. Failure of estrogen production at menopause has also been associated with a relevant loss of muscle mass with a resultant effect on the efficacy of muscles. Some studies have also link taking estrogen (via hormone replacement therapy) reduce the risk of developing osteoarthritis. Also, the lack of testosterone puts women at higher risk of developing hip OA. Testosterone helps build muscles, and men tend to have stronger leg muscles than women. Strong muscles help support the hip joint, lowering the risk of osteoarthritis.

Another important factor that may put women at risk for osteoarthritis of the hip is obesity. Studies have linked obesity to hip OA. At any given BMI, women have more total body adiposity (fat mass, percentage body fat) than men. Obesity is a primary risk factor in developing hip OA even though is one of the most preventable predictor. Extra body weight contributes to both the development and progression of joint deterioration.

Diagnosis

Diagnosing hip osteoarthritis in female sex follow the same pattern with the male gender. Hip OA is typically diagnosed from radiograph images showing narrowing of the joint space and osteophytes, however all other structures of the hip joint are also affected. Both gender presented with history of hip pain, stiffness, limited range of motion, walking with a limp and is common to both genders but a difference in the severity of symptoms does exist. Hip OA in women is more frequently part of a polyarticular OA, and at such displays greater symptomatic and structural severity than men. Conventional x-ray remains indispensable in diagnosing hip OA. Radiographic evaluation should examine the amount of joint space narrowing, osteophyte formation and sclerosis. Advanced imaging like MRI can be used to rule out other hip pathology and biomechanical analysis of hip joint cartilage.

Treatment

Treatment of hip osteoarthritis practically follow the same pattern in both gender, though combination of the various management seems to be intriguing amidst gender. The treatment plan for hip OA vary from non-operative management to operative management. Differences in hip OA management and recommendation based on gender has majorly been reported in operative management.

For mild to moderate hip OA, non operative management is the best approach.

Physiotherapy intervention is the main stay in the management of early and mild hip OA. Thermotherapy (cold and hot) has proven to be effective in reducing pain, heat therapy help to improve blood flow by causing vasodilation while cold therapy help to reduce acute pain by slowing circulation and reducing acute swelling. Exercise therapy should be targeted toward strengthening hip muscles and improve joint range of motion. Weight reduction program should also be incorporated to loose general body weight. Unloading the joint via weight loss help to slow down the rate of cartilage loss and decrease joint impact. Other adjunct that physiotherapist can employ in hip OA management include Transcutaneous Electrical Nerve Stimulation (TENS) for pain management, orthotic devices and assistive devices. No evidence to support manipulative therapy has been effective in the management of hip OA. Acupuncture is equally not recommended.

In pharmacological management, treatments include drugs administered topically, orally, and by intra-articular injection. Some treatments aim to relieve symptoms alone, whereas others, disease-modifying osteoarthritis drugs (DMOADs), attempt to alter the course of disease. Acetaminophen typically is recommended as a first-line medication for OA. Non-steroidal anti-inflammatory drugs (NSAIDs), such as such as ibuprofen (Advil), or naproxen (Aleve), can reduce pain as well as the inflammation that contributes to pain. However, topical NSAID and Acetaminophen should be considered ahead of other oral pain killer like NSAIDs and opioids. Intra-articular injection though helpful in pain management of hip OA but effect is often temporary, lasting from weeks to months. The most common intra-articular injection is the steroid injection, repetitive use of steroid injection should be avoided as it can further damage the cartilage and surrounding tissues. Other types of injections, include Hyaluronic acid injections and Regenerative medicine injections. Both have been on the increase as regard usage in the management of hip OA but only limited researches are available to back up their efficacy. Gender differences in the pharmacological approaches of hip OA management has not been well studied hence need for more studies in this area.

Surgery in hip osteoarthritis become imperative when condition become debilitating, causing so much pain, affecting activities of daily living and other treatment options are not helpful. Hip athroplasty is the most common and most successful surgery done for hip OA. Hip OA is the leading cause of hip athroplasty. It becomes more important in managing end-stage hip OA where conservative therapy become ineffective. It is said that about 10% of people will get a hip replacement in their lifetime. Studies have shown that THAs more often performed in women than men. While some studies have shown that women have less peri-operative and complications rate following THA, other studies have observed similar failure rates and functional outcomes among men and women. It's still unclear how anatomical sex differences can influence functional outcomes and implant survivorship. As this debate as how gender affect THA outcome is ongoing, the orthopedic industry has already started developing sex-specific devices.

Patients will need three months post-op before they can fully return to daily activities following THA.

Another surgical approach in hip OA management is hip resurfacing. The main goal here is to reduce friction in the hip joint so as to reduce pain and further improve the range of motion at the joint. This procedure has proven to be more successful for active male under the age of 55 with primary OA.

Recommendation

There should be plan in the future to do more studies on hip OA with focus on the female gender. Though being the majority of world population, women's representation in scientific research on women still lags behind that of men's. There is confusion in the sex that suffers more from hip OA. While some causes have been established to expose the female gender more to hip OA, other causes have only been linked without been established. Further studies should be done to understand which gender is more predispose to hip OA and biomechanics of hip OA in women.

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