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Review literature of osteoarthritis epidemiology in females

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Abstract---The scope of this research project allows for the investigation of osteoarthritis risk factors on an individual as well as a joint level. Osteoarthritis is affecting a growing number of people all over the world, and this condition has a substantial negative impact on the quality of life that these individuals lead. The initiation or development of osteoarthritis in people is associated to many factors, including ageing, gender, socioeconomic status, family history, and obesity, among others. Injury and the stresses placed on joints in the workplace both have a role in the progression of osteoarthritis. Regular physical exercise of a moderate intensity does not seem to raise the risk of osteoarthritis. According to more recent or expanding studies, the early stages of osteoarthritis may be brought on by structural damage, vitamin deficiencies, and differences in the length of the limbs. It is likely that we may not know all there is to know regarding the beginning and progression of osteoarthritis. This is a possibility. The good news is that the chances of developing osteoarthritis due to joint injuries and obesity may be mitigated, and in some cases completely eliminated.

Keywords---Osteoarthritis, Females, Epidemiology, Risk factors.

Introduction

As one of the most common long-term health issues, osteoarthritis is also one of the primary causes of pain and functional limitations in people [1–5], affecting a wide range of medical outcomes [6–10]. This study expands on prior thorough assessments of the epidemiology of osteoarthritis [11–13] Through fresh study that began in 2013. In the same way that previous evaluations have said [11,12],

Individual and joint features are used to classify possible risk factors. Other articles in this issue address the topic of genetics. Osteoarthritis prevalence and incidence estimates have varied widely across studies [11,12]. There is general consensus that a sizable fraction of the adult population is afflicted by this condition. Cohort and community-based research initiatives have recently been published [14–20,21,22]. Radiographic evidence and/or patient reports have been used to further document the prevalence of osteoarthritis in various joints. In the following paragraphs, you will find the most important findings from these investigations. In the Framingham Study Community Cohort, the prevalence of radiographic but not symptomatic hip osteoarthritis was greater in men than in women at 19.6% and 4.2%, respectively [14]. Radiographic and symptomatic knee osteoarthritis was found in a Malmo cohort of adults to be 25.4 percent and 15.4 percent, respectively. [23]; In terms of age, it is equivalent to other age groups. [11,12]. The prevalence of osteoarthritis in the midfoot and forefoot ranged from 0.1 to 61%, depending on the age, gender, and joint(s) investigated, according to a review of research [18]. To learn more about the prevalence of foot osteoarthritis and the variables that increase one's risk, further controlled population studies are still required. On the basis of a 72 percent response rate from over 26,000 people in England with a minimum age of 50 who replied to mail-in surveys [21], Subjects with osteoarthritis were found in one in four of the four joints examined. According to the Worldwide Burden of Disease 2010 survey, the prevalence of knee and hip osteoarthritis in 2010 was 3.8 percent and 0.85 percent, respectively [22]; Osteoarthritis was the 11th most common cause of impairment in a study of over 300 health problems. A growing number of research are being conducted [24,25,26,27] The prevalence of osteoarthritis has been quantified by analysing massive databases of medical information. Osteoarthritis was predicted to afflict 14.6 persons per 1000 person-years in 2000/2001, according to health statistics from British Columbia in Canada, and it rose by 2.5–3.3 percent each year until 2008/2009 [25]. Over 3 million patients in northeast Spain's primary care data showed that osteoarthritis of the knee, hip, and hand occurred at rates of 6.5 (6.4, 6.6) per 1000 person years, 2.1 (2.0–2.1), and 2.4 (2.4–2.4) per 1000 person years, respectively (Fig. 1) [26]. However difficult it is to code accurately and generate appropriate case definitions, these studies show the enormous potential of administrative health data to estimate population burden and trends in osteoarthritis.

Methodology

In order to locate publications pertinent to the issues, an exhaustive search was conducted across a variety of platforms, including google scholar, PubMed, and the e-library. It was discovered that there were 60 publications, each of which was reviewed for duplication and insufficient data. After this, 21 articles were eliminated, and the remaining 39 papers were thoroughly researched for the literature review.

Person-Level Risk Factors

Osteoarthritis has been associated to a number of risk factors at the individual level, including the following. Osteoarthritis is more common in women than in males, and the risk rises with age [11,12]. Studies reveal that those with lower

socioeconomic position are more likely to have cancer [28–30] between African American race [31,32]. Occurrence of knee discomfort and exacerbation of symptoms were both related with having a parent who had had total knee replacement, according to a new set of research [33], as well as a shortening of the medial joint space [34].

Obesity and metabolic syndrome

Overweight people have a three-fold greater risk of knee osteoarthritis and data suggests that obesity might expedite the disease's progression [11,12,35]; this corpus of literature has been enriched by new research [36–38]. In a cohort study [39] After controlling for BMI and other variables, MRIs of knee joints in US women with higher baseline blood leptin levels showed an increased risk of severe joint injury. In a second investigation, [40] One research found that the leptin levels of elderly persons accounted for about half of the association between BMI and knee osteoarthritis. Obesity and osteoarthritis may be linked through a metabolic/inflammatory route, according to these studies. Knee bone marrow lesions in individuals with both asymptomatic and established osteoarthritis (OA) have been linked to increased blood lipid levels and moderate obesity [41]; As long as the results on serum lipids are confirmed, this might be an important early risk factor that can be changed. There was a case-control study, which is interesting [42] However, some studies have revealed inconsistent findings relating statin usage and the frequency of widespread osteoarthritis. In a second investigation, [43] Osteoarthritis symptoms improved with weight reduction or maintenance in a sample of obese patients, suggesting the positive impact of weight loss or maintenance.

Additionally, obesity has been linked to hand osteoarthritis in previous studies as well as in more recent ones [11,12,44], Obesity may have a function in metabolic or inflammatory processes. In a Netherlands-based research project [45] Hand osteoarthritis was more common in men with visceral adipose tissue than in women with greater body fat percentages, fat mass, and waist-to-hip ratios. Obesity and hip osteoarthritis seem to have a weak relationship, according to many research [11,12].

Nutritional and vitamin factors

There has been a lot of interest in the function of nutrition in osteoarthritis in recent years. Women who consumed more milk at the start of the Osteoarthritis Initiative (OAI) study had less joint space narrowing over the course of four years [46]. Osteoarthritis and vitamin D have been studied in opposing ways in the past [11,12], A scientific trial also found that taking vitamin D supplementation had no effect on the rate of cartilage degeneration in the knees [47]. However, two recent investigations have shown that this is not the case [48,49] An increased incidence of symptoms and joint space advancement was seen in osteoarthritis individuals who had low vitamin D levels; this was compounded in those with high parathyroid hormone levels. Following up on previous research [11,12] a research found a link between osteoarthritis and a deficiency in vitamin K [50] Researchers studying the MRI results of older persons discovered that those with low plasma phylloquinone (vitamin K1) levels were more likely than those with adequate levels

to have articular cartilage and meniscus deterioration worsen over three years. Vitamin C and E have been shown to have a preventive impact on osteoarthritis risk and development, although findings have been inconclusive [11,12]. When it comes to knee osteoarthritis, people with the highest circulating vitamin C levels were shown to be more likely to suffer from it than those with the lowest [51]. There is a clear need for further study on the impact of vitamins and other dietary variables in osteoarthritis risk and results in the long term.

Bone density and bone mass

High bone density has been linked to an increased risk of developing osteoarthritis, according to previous studies [12]. Despite the fact that the mechanisms and a direct causal link are yet unknown. There have been two recent studies that show this [52,53]. Radiographic hip and knee osteoarthritis prevalence was significantly higher in persons with very high bone mass than in control groups. Considering that osteoarthritis is a later-in-life illness, our research supports the hypothesis that increased bone mass plays a role in its development. These studies have confirmed the existence of a hypertrophic osteoarthritis phenotype by showing that increasing bone mass was more closely associated with subchondral sclerosis than with joint space reduction.

Smoking

Studies on the link between smoking and osteoarthritis were compiled in a review [54], except in cohort studies, updating a meta-analysis that indicated an inverse correlation [55]. From the data collected so far (including a recent study), the authors found that [56] Smoking has been linked to a decreased risk of osteoarthritis of the knees and hips. Osteoarthritis may be devastating for smokers, on the other hand [55].

Other person-level risk factors

There have been two recent research on this topic [57,58] found that low birth weight was linked to the development of osteoarthritis. An increased adjusted risk of future hip arthroplasty in an Australian population was shown to be associated with both low birth weight and preterm at the time of delivery [57]. Hip osteophytes and low birth weight were observed to be associated in the Hertfordshire Cohort Study. The relationship between low birth weight and osteoarthritis isn't fully understood, but those at increased risk for the condition should be on the lookout for extra signs and symptoms. Prior investigation [59–62] Using index-to-ring finger length ratios, researchers found a correlation between testosterone exposure during pregnancy and knee osteoarthritis, but no link to hip osteoarthritis. Melbourne-based cohort study [63] knee but not hip replacements have been linked to a reduced index-to-ring finger ratio.

Joint-Level Risk Factors

Osteoarthritis may begin and/or develop as a result of the following joint-level causes.

Bone/joint shape

Osteoarthritis risk has increased in recent years, with previous study revealing a link between hip proximal femur morphology and subsequent hip osteoarthritis [12]. There have been two recent research on this topic [64,65] employed active shape modelling to investigate the link between osteoarthritis and the morphology of the proximal femur. Osteoarthritis-inducing hips in Johnston County, North Carolina, had a distinct proximal femur shape from healthy hips, but only in males [64]. Osteoarthritis patients with medial and lateral osteoarthritis had altered morphology of the ipsilateral proximal femur compared to controls [65]. MOST researchers found [66], Women exhibited a lower femoral offset and a greater hip height centre, as well as a greater valgus neck-shaft angle and a greater abductor angle than males, which may help explain the disparities in prevalence of lateral tibiofemoral osteoarthritis between men and women, according to a new study. Findings from a different research project [67] The acetabulum of women with radiographic hip osteoarthritis and complete hip replacement suffer from increased femoroacetabular impingement as well as abnormalities.

Injury

Osteoarthritis is more prevalent in the knees because of the prevalence of traumatic joint injury [68– 73] and the ankle [74–76]. There is a link between ACL damage and osteoarthritis, according to a meta-analysis of 20 studies, which found that persons with ACL deficit and reconstructed knees had altered levels of osteoarthritic synovial fluid biomarkers when compared to controls [77]. A study of OAI data shows that damage may hasten the progression of joint disease [78]; It was shown that those who'd previously had a knee injury were more likely to acquire advanced knee osteoarthritis after 48 months compared to those who hadn't. As a therapy to prevent knee osteoarthritis, surgical repair seems to be a problematic one. In the Swedish National Patient Registry [79], Over the course of nine years, patients who had reconstructed cruciate ligament tears had a higher probability of developing knee osteoarthritis than those who had not had surgery. In a review of Ontario, Canada's administrative databases [74], Seven times more patients who underwent cruciate ligament repair than those who didn't ended up needing knee replacement surgery.

Muscle strength and mass

According to the muscles and joints analysed, muscular strength and osteoarthritis have been connected in different ways [11,12], knee osteoarthritis development and progression have been linked to muscular weakness in recent studies [80,81]. Muscle strength and cross-sectional area were not significantly different between the afflicted and unaffected limbs of OAI patients with early knee osteoarthritis [82]. Even though radiographic severity had no influence on these strength tests, symptomatic knees in the OAI group exhibited lower isometric extensor and flexor strength than asymptomatic knees [83]. A new OAI study is underway for the third time [84] We found that the intramuscular fat areas were greater in women with chronically painful knees than in those with pain-free contralateral knees. It remains to be seen what function muscular

strength has in OA, however it has been shown to have a role in the symptoms of OA, such as pain and swelling.

Joint loads and alignment

Static and dynamic alignment in osteoarthritis of the knee have been extensively studied in scientific literature [11,12,85–87]. The course of osteoarthritis in the knee is well predicted by the way the knees are aligned [88], inconclusive results have been found regarding the occurrence of knee osteoarthritis [89]. A new research [86] of obese women without osteoarthritis of the knee demonstrated a link between varus alignment and incidence radiographic but not clinical osteoarthritis of the knee. Structural knee osteoarthritis development was shown to increase with increased knee adduction moment in a meta-analysis. [87]. Osteoarthritis in the first metatarsophalangeal joint has been associated to hallux valgus [90], osteoarthritis of the knee and hip [91].

Occupation and physical activity

As a result of past research [11,12] Osteoarthritis of the hip and knee has been linked to inappropriate or excessive lower extremity joint loads in the workplace. Osteoarthritis risk has not been linked to moderate physical exercise [11,12], in addition to that, new research has emerged [92] A study from the Johnston County Osteoarthritis Project found no link between physical inactivity and an increased risk of radiographic or clinical osteoarthritis.

Discussion

Osteoarthritis is more common in women than in men, with a little gender difference. Women are more likely than men to suffer from osteoarthritis, especially in the knees and hands. The gap between menopausal and non-menopausal women widens dramatically as a woman reaches menopause. Because women's hips are bigger than those of men, this may also be the reason. Because the hip bones' angle is wider than the knees', the outside of the knees are exposed to increased stress. In certain women, even a little "knock-kneed" posture may eventually contribute to osteoarthritis. Women are more likely than men to suffer from patellofemoral syndrome, a condition in which the patella (kneecap) becomes stuck in the joint and becomes painful to move (femur). As a result of their hyperextended knees, women may be more likely to have a misalignment of the pelvis. Repetitive kneecap rubbing on the thighbone may create pain in the front knee, which can progress to arthritis. Osteoarthritis is becoming more common among women, which has encouraged researchers to look at the role hormones play in the illness. Oestrogen and progesterone's role in osteoarthritis is not fully understood, although hormone replacement therapy (HRT) has been shown to protect against the disease. Osteoarthritis of the knees and hands was shown to be less common in women who received hormone replacement therapy (HRT) in the 1997 Chingford Study in London. Research on the role of hormones in osteoarthritis continues. Researchers have also looked at the role of relaxin, a hormone that increases during pregnancy and loosens joints. According to one notion, women's hands are more likely to develop osteoarthritis than men's hands. We're only beginning to look into this connection.

Conclusion

Osteoarthritis risk factors include, but are not limited to, a person's age, gender, obesity, food, joint stress or injury, and the shape or alignment of the joint. Given the complexity of osteoarthritis, future studies should include these relationships. Other osteoarthritis risk factors must be addressed together with the need for greater research into the mechanisms that contribute to osteoarthritis development and the need for public education about these risk factors.

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