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Review Article

Osteoarthritis in Elderly Population in Family Practice

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Abstract

Background: Osteoarthritis (OA) is common, debilitating disease which is associated with a large societal and economic burden, in addition to the physical and psychological sequelae it often manifests in the affected individual. Osteoarthritis is one of the leading causes for absence of the elderly individuals from workplaces, social gatherings, and festivities. Often, these patients neglect and remain unsatisfied due to ignorance, delayed presentation, long duration of therapy, financial constraints, rampant quack practices, ineffective motivation, and counseling with ineffective exercise regimens.

Aim: In this review, we will look into the epidemiology, risk factors, diagnosis, and management of osteoarthritis among elderly population.

Methodology: The review is comprehensive research of PUBMED since the year 1964 to 2018.

Conclusion: OA is the commonest joint disease worldwide and mainly occurs in later life. It tends to be slowly progressive and can cause significant pain and disability. The burden of OA is physical, psychological and socioeconomic. It can be associated with significant disability, such as a reduction in mobility and activities of daily living. Due to lack of affordable and accessible health care services, there is need for community based efforts to effectively screen, diagnose and treat various prevalent conditions in urban slums, osteoarthritis being one of them. Due to costlier treatment of osteoarthritis, early community based diagnosis using easy tools such as ACR and implementing appropriate intervention so as to halt the course of disease at an earlier stage, seems to be an adequate solution.

Keywords: *Osteoarthritis; Elderly; Osteoarthritis among Elderly*

Introduction

Osteoarthritis (OA) is common, debilitating disease which is associated with a large societal and economic burden, in addition to the physical and psychological sequelae it often manifests in the affected individual. It is a degenerative joint disease involving the cartilage and many of its surrounding tissues. In addition to damage and loss of articular cartilage, there is re-modelling of subarticular bone, osteophyte formation, ligamentous laxity, weakening of periarticular muscles, and, in some cases, synovial inflammation [1]. Osteoarthritis may not directly lead to mortality but influences the Quality of Life (QoL) largely. Presence of osteoarthritis in older adults was associated with more pain, functional limitations, and lower Quality of Life (physical component) [2].

Age is a one of the strongest risk factors for OA of all joints The increase in the prevalence and incidence of OA with age probably is a consequence of cumulative exposure to various risk factors and biologic changes that occur with aging that may make a joint less able to cope with adversity, such as cartilage thinning, weak muscle strength, poor proprioception, and oxidative damage [3,4].

Osteoarthritis is one of the leading causes for absence of the elderly individuals from workplaces, social gatherings, and festivities. Often, these patients neglect and remain unsatisfied due to ignorance, delayed presentation, long duration of therapy, financial constraints, rampant quack practices, ineffective motivation, and counseling with ineffective exercise regimens [5].

Osteoarthritis represents a particularly strong argument for a primary care perspective on needs assessment. It is the second most common diagnosis made in older people consulting their general practitioner, and the commonest cause of disability at older ages [6].

OA can be defined pathologically, radiographically, or clinically. Radiographic OA has long been considered the reference standard, and multiple ways to define radiographic disease have been devised [7]. Treatment options include NSAIDs and intra-articular (IA) corticosteroids to treat OA pain, but several other oral, intra-articular and topical agents are available. In the elderly particularly, non-pharmacologic options like exercise, weight loss, physical therapy (PT), bracing and orthotics should be considered first to minimize medication adverse effects (AE). Furthermore, depression and anxiety commonly accompany chronic pain and must be addressed as they impact functional decline [8].

In this review, we will look into the epidemiology, risk factors, diagnosis, and management of osteoarthritis among elderly population.

Epidemiology

Prevalence of OA increases with age; 13.9% of adults age 25 and older have clinical OA of at least one joint, while 33.6% of adults age 65 and older have OA [9]. OA may develop in any joint, but most commonly affects the knees, hips, hands, facet joints and feet. In 2005, it was estimated that over 26 million people in the US had some form of OA. Approximately 27 million US adults and 8.5 million UK adults are estimated to have clinical OA defined on the basis of symptoms and physical findings [10].

The knee is the most studied site affected by OA with a lifetime risk from 25 years of approximately 13.83% overall in the US population, being highest in obese women (23.87%) [11]. The prevalence of radiographic knee osteoarthritis in subjects aged 60 and higher increased with each decade of life from 33% among those aged 60 - 70 to 43.7% among those over 80 years of age while the prevalence of symptomatic knee OA in these subjects was 9.5% and increased with age in women but not men [12].

Pathophysiology

The destruction and loss of the articular cartilage is central to the development of OA and most of the research to date on aging mechanisms relevant to OA has focused on changes in the cartilage. With normal aging the cartilage appears slightly brown due to an accumulation of advanced glycation end-products and is thinner than in young adults but is otherwise smooth and intact. The accumulation of advanced glycation end-products has been found to alter the biomechanical properties of cartilage making it more “brittle” and susceptible to degeneration [13].

The destruction and loss of the articular cartilage in OA is driven by an imbalance in the production and activity of pro-inflammatory and catabolic mediators, including a host of cytokines and chemokines, relative to the activity of anabolic factors. The senescence-associated secretory phenotype is characterized by increased production of many of the same cytokines, chemokines, and MMPs found in OA cartilage, suggesting that OA chondrocytes assume a senescent phenotype [14,15].

Age-related mitochondrial dysfunction has been suggested as a contributing factor in the development of OA. One of the hallmarks is mitochondrial dysfunction which can promote age-related disorders in part through increased levels of reactive oxygen species (ROS). Increased levels of ROS can result in oxidative damage which is one mechanism by which ROS can promote age-related disease [16].

Normally, the cellular levels of ROS are controlled by the balance of ROS production and the activity of various anti-oxidants. Glutathione is a major intracellular anti-oxidant and it was noted an age-related increase in the amount of oxidized relative to reduced glutathione consistent with an age-related increase in ROS [17,18].

Risk factors

The risk of developing OA is influenced by systemic and local factors. Local factors are, e.g. increased loads on part of the joint caused by muscular dysbalance, leg malalignment, or posttraumatic changes. Several systemic risk factors for osteoarthritis have been identified: obesity, metabolic disease, sex ethnicity, race, genetics, and last but not least, age. Both prevalence and incidence of radiographic and symptomatic knee OA increase with age [19].

Gender

Women not only are more likely to have OA than men, they also have more severe OA In a randomized clinical trial (the Heart and Estrogen/Progestin Replacement Study) in a group of older postmenopausal women with heart disease, no significant difference was found in the prevalence of knee pain or its associated disability between those taking estrogen plus progestin therapy or those taking placebo [20,21].

Race

The prevalence of OA and patterns of joints affected by OA vary among racial and ethnic groups. Results from the Johnston County Osteoarthritis Project have shown that the prevalence of hip OA in African American women (23%) was similar to that in white women (22%), and prevalence was slightly higher in African American men (21%) than that in white men (17%) [22,23].

Obesity

Obesity and overweight have long been recognized as potent risk factors for OA, especially OA of the knee. The relationship between overweight and hip OA is inconsistent and if it exists, is weaker than that with knee OA. Increased loading on the joint is probably the main, but not only, mechanism by which obesity causes knee or hip OA. Overloading the knee and hip joints could lead to synovial joint breakdown and failure of ligamentous and other structural support. Results from a meta-analysis concluded that while the effects of weight loss on pain were less consistent weight reduction by about a 5% was associated with an improvement of physical function [24,25].

Injury

Numerous studies have shown that knee injury is one of the strongest risk factors for OA. Severe injury to the structures of a joint, particularly a trans-articular fracture, meniscal tear requiring meniscectomy, or anterior cruciate ligament injury, can result in an increased risk of OA development and musculoskeletal symptomatology [26,27].

Activity

The general level of physical activity itself may also increase the risk of OA. However, person who engaged in relatively high levels of such activity had a threefold greater risk of developing radiographic knee OA than sedentary persons over 8 years of follow-up [28].

Diet

Dietary factors are the subject of considerable interest in OA, results of studies, however, are conflicting. One of the most promising nutritional factors for OA is vitamin D. Low vitamin C dietary intake was associated with an increased risk of progression. In one study, high levels of serum vitamin K were associated with a low prevalence of radiographic hand OA in one study, particularly for the presence of large osteophytes [29,30].

Genetics

Results from several studies have shown that OA is inherited and may vary by joint site. Several studies also found that an inverse association between general joint hypermobility, a lone benign trait, with hand and knee OA and serum cartilage oligometric matrix protein levels [31].

Diagnosis

Clinical OA is defined by features in the history and on examination. It invariably requires the presence of joint pain in addition to other features. These have been developed for the hip, knee and hand [32].

The most common method for radiographic definition is the Kellgren-Lawrence (K/L) radiographic grading scheme and atlas which has been in use for over four decades. Other radiographic metrics including semi-quantitative examination of individual radiographic features, such as osteophytes and joint space narrowing, or the direct measurement of the inter-bone distance as an indicator of the joint space width in the knees and hips are used to investigate progression in epidemiologic studies and clinical trials of disease modifying therapies [33].

More sensitive imaging methods using magnetic resonance imaging (MRI) can visualize multiple structures in a joint and are undergoing evaluation for their role in defining OA and for their usefulness in detecting the effects of potential disease-modifying interventions more quickly than possible with conventional radiographs [34].

Interestingly, individuals with early painful OA may be free from radiographic changes and, conversely, those with severe radiographic changes may be entirely asymptomatic. There is a correlation between the severity of radiographic disease and symptoms; however, the association is not strong [35].

Management and treatment

When the diagnosis of OA is established, the basic therapeutic program needs to be outlined for the patient. Treatment goals are relieving pain and preserving function. To date, there is no therapy that has been established to have disease modification.

Non-pharmacologic interventions

The non-pharmacologic program is critically important and needs to become a part of their life style. Patients need to dispel the concept that modest physical activities are harmful. Indeed, strengthening of the para-articular structures actually supports the joint, rather than damages the joint [36].

Exercise, weight management, and medications are the first-line treatment for OA. Regular exercise is beneficial for people with OA and is required to strengthen muscles, reduce pain, and improve the functional status of patients with mild to moderate OA. Although exercise improves OA pain, people in pain may avoid exercise and, therefore, may not adhere to the exercise regime; thus, health professionals should tailor the type and intensity of exercise according to the individual needs and abilities of the patient and should provide guidance [37].

Elevated joint load is associated with severity and progression of knee OA. Bare foot walking reduces joint loads at the hip and knee. Educating elderly patients about selection of footwear, promoting flat and flexible low heel shoes may help in reducing joint loads [38].

Simple neoprene knee sleeves have been demonstrated to decrease pain and perhaps improve function in patients with medial knee OA. Stability and balance are of particular importance in elderly patients at greater risk for falls and unloading braces can stabilize the joint and improve balance. Various types of external bracing devices are available commercially: rest braces, knee sleeves, un-loading knee braces as well as patellar taping and bracing [39].

Pharmacologic therapies

Pharmacologic agents in use for OA can be divided by route of administration: oral, topical, and intra-articular (IA). Pharmacologic agents could also be divided by class of agent: analgesics, anti-inflammatory drugs with analgesic properties, psychoactive drugs, and agents with less clearly defined mode of action [40].

NSAIDs treat inflammatory pain, and also reduce swelling and joint stiffness. A systematic review of 27 RCTs confirmed the superiority of NSAID to acetaminophen for pain relief in OA. Recently there has been controversy regarding cardiovascular (CV), gastrointestinal (GI) and renal toxicities of acetaminophen, with chronic use of more than 3 g per day associated with similar side effects as NSAIDs. Despite side effects, NSAIDs still remain an option in patients with OA-related pain due to their proven efficacy. The high rate of co-morbidities in the elderly complicates their use. The decision to use NSAIDs must be a joint decision between the physician and patient, after discussion of the risks, and with a prospective plan for monitoring side effects and controlling blood pressure [41,42].

Narcotic analgesics are often used in treating pain in OA patients, but concerns about dependency and toxicities are particularly worrisome in the elderly. Opioids had a small benefit in pain and function over placebo, though serious AE and dropouts were greater with opioids. No differences between types or doses of opioids were observed. Use of these agents in combination with standard therapy may allow for decreased dosages, but small benefits may be outweighed by high AE rates limiting their use particularly in older adults [43].

Topical and transdermal agents used as adjunctive therapy theoretically reduce the incidence of systemic side effects, making them attractive in geriatric populations. Two meta-analyses covering 14 placebo-controlled RCTs demonstrated efficacy of topical NSAIDs with duration of effect from two to four weeks. In this analysis, heterogeneity of the products studied, variable efficacy endpoints, and lack of adequate published studies in large numbers of patients made it difficult to conclude whether these agents remain efficacious beyond 4 weeks of treatment [44,45].

Although there are no RCTs testing efficacy, 5% lidocaine transdermal patches (Lidoderm™) are often used by clinicians to control pain in OA [46].

There are a number of nutritional and herbal supplements that are anecdotally reported to decrease arthritis pain and increase mobility. These include ginger extracts, methylsulfonylmethane, MSM s-adenosylmethionine (SAM-e), and ASU (Avocado-Soybean Unsaponifiables) [47].

Hyaluronic acid (hyaluronan, HA) is a natural secretion of the synovium. Joint infections are rare when reasonable aseptic techniques are employed. The molecule is a simple, conserved long chain high molecular weight disaccharide in the normal joint. In OA, HA is most often of low molecular weight, losing its biomechanical and anti-inflammatory properties. Injection of moderate to high molecular weight HA into the joint has been used for knee OA for several years [48].

Conclusion

OA is the commonest joint disease worldwide and mainly occurs in later life. It tends to be slowly progressive and can cause significant pain and disability. The burden of OA is physical, psychological and socioeconomic. It can be associated with significant disability, such as a reduction in mobility and activities of daily living. Due to lack of affordable and accessible health care services, there is need for community based efforts to effectively screen, diagnose and treat various prevalent conditions in urban slums, osteoarthritis being one of them.

Due to costlier treatment of osteoarthritis, early community based diagnosis using easy tools such as ACR and implementing appropriate intervention so as to halt the course of disease at an earlier stage, seems to be an adequate solution.

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