# RESEARCH ARTICLE

# COMORBIDITIES IN OSTEOARTHRITIS AFFECTING QUALITY OF LIFE

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| **ARTICLE INFO** | **ABSTRACT** |

Osteoarthritis (OA) is considered the most common disorder of the musculoskeletal system and the greatest cause of disability in both developed and the so-called emerging countries. Since the population is aging, the prevalence of OA has increased, and its consequences have a great socio-economic impact. This study is aimed at assessing the frequency of the association of comorbidities in patients, as well as the impact of such associations on the physical function of patients. The present prospective study was conducted on 100 such patients, presenting with signs and symptoms of knee OA attending Medicine and Orthopaedics OPDs in the Government Medical College, Jammu for a period of one year. All the routine investigations along with x-ray of knees were done and graded on Kellgren-Lawrence Grading Scale. Hypertension was the common comorbidity present in the study population followed by obesity, dyslipidemia, diabetes mellitus, etc. Majority of the patients were having two comorbidities and 82% of the patients were having, at least, one comorbidity. The presence of comorbidities increased physical disability in OA patients. The treatment of such comorbidities in OA patients would, thus, be crucial to reduce the impact on physical disability, and, consequently, enhance the quality of life of the individuals.

## INTRODUCTION

Osteoarthritis of the knee is the most common arthropathy of the knee (Zhang, 2010). It is the fourth leading cause of years lived with disability (Salve, 2010). In India, significantly higher prevalence of knee pain in rural (13.0%) than in urban (8.1%) communities have been reported. Studies done in Jammu demonstrated the prevalence to be 4.24% and the associated risk factors of knee OA being: age, female gender and repeated bending of the knee (Haq, 2011). It is a degenerative joint disease, occurring primarily in older persons, characterized by erosion of the articular cartilage, hypertrophy of bone at the margins (*i.e.* osteophytes), subchondral sclerosis and a range of biochemical and morphologic alterations of the synovial membrane and joint capsule. It may be classified as primary or secondary according to its cause or major predisposing factor; what all OA has in common is altered cartilage physiology (Srinivas, 2012). Primary OA is the most common type and has no identifiable etiology or predisposing cause. Secondary OA, although it has an identifiable underlying cause, is pathologically indistinguishable from primary OA. The most common causes of secondary OA are metabolic conditions (*e.g.*, calcium crystal deposition,

hemochromatosis, acromegaly), anatomic factors (*e.g.*, leg length inequality, congenital hip dislocation), traumatic events (*e.g.*, major joint trauma, chronic joint injury, joint surgery), or the sequel of inflammatory disorders (*e.g.*, ankylosing spondylitis, septic arthritis). Distinguishing between primary and secondary OA may be difficult because the clinical presentation and symptoms are often so similar (Di Cesare, 2005). Knee OA is also found in people who play intense physical sports requiring severe strain and loading on the joints. Prior injury is a major indication toward future development of the disease. Another major cause of knee OA is often associated with obesity in the upper extremity, leading to heavy weight bearing of the knee. Progressive cartilage degeneration of the knee joints can lead to deformity which may lead to outward curvature of the knee, referred to as "bow-legged." People with OA in the knee can then develop a limp which can worsen as more and more cartilage degenerates with time.

Degenerative changes in the knee joint are also thought to increase postural sway (Wilson *et al.*, 2011). In some patients, the pain, limping and joint function do not respond to medications, therefore more extreme measures need to be taken to fix the problem, such as total knee replacement. In cases of advanced OA, only a total joint replacement can provide relief; however, many patients are not candidates for joint replacements (Lessi, 2012). The exact etiology of knee OA

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remains unclear, but it is frequently associated with repetitive micro-traumas, previous knee surgery, metabolic or endocrinological factors, heredity, obesity and joint overload (Jordan *et al.*, 2003). Radiographic findings include joint space narrowing, osteophyte formation, subchondral sclerosis and cysts (Felson *et al.*, 1987). However, radiological findings do not always correlate with patients' knee symptoms. The disease has a progressive impact upon activities of daily living, ultimately leading to a progressive loss of functional independence and deterioration of quality of life. Current clinical guidelines recommend non-pharmacological strategies as the first line management of OA symptoms (Zhang, 2008). Interventions have typically focused on symptomatic relief and improvement of functional status (Cetin, 2008) as well as lifestyle modification, weight reduction, drugs, surgery, and rehabilitation interventions such as exercises and physical agents (Bray *et al.,* 2006).

## Osteoarthritis and comorbidities

The major comorbidities of OA patients are systemic arterial hypertension (SAH), obesity, diabetes, involvement of other joints (ankle, elbow wrist hand shoulder) and dyslipidemia (Rojas-Rodríguez, 2007). Despite the clear relation between OA development and the trauma resulting from excessive weight, the occurrence of OA in joints that do not bear load suggest that the chronic inflammation status existing in patients with metabolic syndrome can alter the metabolism of cartilage, regardless of excessive weight. In addition, glucose intolerance can also collaborate to maintain that persistent inflammation status in obese individuals with metabolic syndrome (Memel, 2000). As OA is the major cause of pain in elderly patients, a population with a very high prevalence of depression, the coexistence of both diseases is frequent. The impact of depression on OA is significant, since it influences the two major joint symptoms: pain and physical disability. Depressed individuals are more likely to report chronic or more severe pain, and more than half of the patients with chronic pain are depressed (Kadam, 2007). The presence of diabetes, heart disease or even visual alterations is not only more frequent in OA patients, but also lead to a greater impairment of physical functions and quality of life (Lawrence, 1989).

## OA and Quality of life

Because the prevalence of OA increases with aging, coexistence with other chronic diseases is common, further increasing the impact on the quality of life (QoL) of those patients. OA is one of the commonest morbidities in older people and the most common reason for restricted activity in their daily life. It has a high impact on healthcare use and costs, both in hospital (for example, joint replacements) and primary care (for example, consultations and drug use). It is a particularly important public health problem in an aging population. Prevalence of many other disabling conditions also rises with age, and some common chronic conditions can be found alongside OA. It is not known, however, if there is comorbidity specific to patients with OA in general practice or how such comorbidity might contribute to the overall impact of an individual condition such as OA on the healthcare services (Ettinger *et al.*, 1994).

## MATERIALS AND METHODS

This study aimed at assessing the frequency of the association of comorbidities patients, as well as the impact of such associations on the physical function of patients. The present prospective study was conducted on patients presenting with signs and symptoms of knee OA attending Medicine and Orthopaedics OPDs in the Government Medical College, Jammu for a period of one year. Patients diagnosed as per American College of Rheumatology (2000) criteria (clinical and radiographic) with knee pain and radiological osteophytes and one of the following– crepitus on knee range of motion, age 50 years or older and morning stiffness of short duration (<30 minutes) were included in the study, while all the patients suffering from secondary OA knees, e.g. rheumatoid arthritis, psoriatic arthritis, septic arthritis, gout, reactive arthritis etc. were excluded from the study.

The comorbid conditions that were studied included hypertension, obesity, diabetes mellitus, involvement of other joints and dyslipidemia. The demographic profile of 100 patients who fulfilled inclusion criteria was taken. Detailed history about knee OA was taken. History about any other coexistence disease was taken. Detailed examination of the patients was done. All the routine investigations along with x-ray of knees (both AP and lateral view) were done. X-rays knees were than graded on Kellgren-Lawrence Grading Scale. Grade-1: Doubtful narrowing of joint space and possible osteophytic lipping.

Grade 2: Definite osteophytes, definite narrowing of joint space. Grade 3: Moderate multiple osteophytes, definite narrowing of joints space, some sclerosis and possible deformity of bone contour. Grade 4: Large osteophytes, marked narrowing of joint space, severe sclerosis and definite deformity of bone contour. Data was analysed with the help of computer software MS-Excel, SPSS for Windows. Statistical significance was tested using unpaired t-test. A level of p<0.05 was accepted as statistically significant.

## RESULTS AND DISCUSSION

We used a large database of general practice records to describe the prevalence and patterns of clinical comorbidity using the index condition of OA. As the first phase in an investigation of OA comorbidity, our study investigated the prevalence of multiple clinical problems in patients with OA compared with controls matched for age and sex in a national population of primary care consulters. Hypertension was the common comorbidity present in the study population (33%) followed by obesity (30%), dyslipidemia (25%), diabetes mellitus (23%) and involvement of other joints: ankle/elbow/wrist/hand/shoulder (21%) (Table 1).

**Table 1. Various comorbidities in the study population**

| Comorbidities | Total | Percentage |
|---|---|---|
| Hypertension | 33 | 33 |
| Diabetes mellitus | 23 | 23 |
| Involvement of other joints (ankle/elbow/wrist/hand/shoulder) | 21 | 21 |
| Dyslipidemia | 25 | 25 |
| Obesity | 30 | 30 |

**Table 2. Number of comorbidities in the study population**

| Number of comorbidities | Total | Percentage |
|---|---|---|
| 0 | 18 | 18 |
| 1 | 20 | 20 |
| 2 | 33 | 33 |
| 3 | 29 | 29 |
| Total | 100 | 100 |

Similar observations were made by Clin *et al.* (2011). Average number of comorbidities present in the study population was 1.7. Majority of the patients were having two comorbidities (33%). 18% of the patients were not having any comorbidity, whereas 82% of the patients were having, at least, one-comorbidity (Table 2). Similar observations were made by Jeroen *et al.* (2006). This large survey provided a more differentiated view on QoL of patients with type 2 diabetes in primary care regarding the common comorbid conditions hypertension and OA and therefore contributes to a better understanding of diabetic patients. The study emphasized that OA as a common, disabling and painful comorbid condition has a stronger impact on QoL than hypertension.

Individualized care of patients with chronic conditions should consider both improving QoL and controlling risk for severe complications. For primary care physicians this constitutes a challenge with different faces and requires awareness of the patients' differentiated perception. In order to affect QoL, in primary care, OA should get more attention as associated pain and disability are more important from a patient's point of view as hypertension. Simultaneously efforts for advising and patient education should focus on hypertension as asymptomatic but important risk factor. So far, most studies have focussed on the impact of one condition on QoL. As our results suggest, it is important to assess several conditions and their impact on individual QoL in future research.

## Conclusion and future perspectives

The presence of comorbidities increases the frequency of physical disability in OA patients, and the influence of the combination is higher than that expected for OA alone or for each disease in isolation. The treatment of such comorbidities in OA patients would, thus, be crucial to reduce the impact on physical disability, and, consequently, enhance the quality of life of the individuals. Over the last two decades, health related quality of life, individual health status or well-being have gained more importance as patient-relevant outcome parameters within medical and health services research. Especially for patients suffering from one or several chronic conditions, care should focus on the best possible management of the disease and additional impairments on daily life instead of recovery and health. For older patients, improvements within QoL may often have a more important role than a possible extension of life time ("add life to years, not years to life").

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