Prevalence of Knee Osteoarthritis and Its Correlation in Women of Rural and Urban Parts of Hoshiarpur (Punjab)

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ABSTRACT

Osteoarthritis (OA) is a major cause of enormous disability in both the developed and developing world. The worldwide prevalence estimate for symptomatic OA is 9.6% among men and 18% among women. The present study was undertaken with the objectives: To estimate the prevalence of Knee Osteoarthritis (KOA) in women of rural and urban Hoshiarpur and to elucidate the correlates of KOA in women of rural and urban Hoshiarpur. The study was conducted in the rural and urban areas of district Hoshiarpur, Punjab (India) between August 2012-May 2013. The sample comprised of urban (200) and rural (200) females. A semi structured interview schedule was used to interview the study subjects. The prevalence was found to be high in urban area (21.5%). The prevalence of KOA was found to be increased with age and was also significantly associated with educational level and menopause.

Keywords: Knee osteoarthritis, Prevalence, Women.


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INTRODUCTION

Osteoarthritis (OA) is the most common form of arthritis. It is defined 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.1 OA is a major cause of enormous disability in both the developed and developing world and is responsible for loss of productivity.2 World Health Report (2002) quoted OA as the 4th leading cause of years lived with disability at global level accounting for 3.0% of total global YLDs in the year 2000.3 It is estimated that, as life expectancy increases the ageing population are expected to make osteoarthritis the fourth leading cause of disability by the year 2020.4

Based on prevalence data from the National Centers for Health Statistics, an estimated 15.8 million adults, or 12% of those between 25 and 74 years of age, have signs and symptoms of OA.5 Consultations for osteoarthritis account for 15% of all musculoskeletal consultations in those aged 45 years old and over, peaking at 25% in those aged 75 years old and above.

The worldwide prevalence estimate for symptomatic OA is 9.6% among men and 18% among women.6 Osteoarthritis ranks fourth among medical problems in women.7,8 Therefore, women are at greater risk of knee osteoarthritis than men. Almost every age group is affected by osteoarthritis, but prevalence increases dramatically after age 50 years in men and 40 years in women.9,10 Osteoarthritis is ranked as one of the leading causes of disability among elders.2,11,12 Despite a lot of available epidemiologic studies on their focus, the exact prevalence of OA is unknown, owing to the uncertainties and variations of diagnostic definition and reporting mechanisms. The burden of OA can be estimated using data on clinical OA (from physical history and exams), radiographic OA (using X-ray), or symptomatic OA (symptoms plus radiographic evidence). Symptomatic OA, is most relevant for public health purposes as the symptoms like pain, aching, stiffness and swelling bother the affected individuals.13 Knee osteoarthritis is the most common form of osteoarthritis.14-17 Other presenting signs and symptoms include stiffness that generally improves after 30 minutes of activity, crepitus, swelling and limp. In advanced cases, patients may present with instability symptoms or valgum (knock knee) or varum (bow-leg).

There is currently no cure for OA. Treatment is aimed primarily at symptom relief, improving joint mobility and function, and optimizing consumer quality of life.18

Patients consult the specialist doctors when the situation becomes worse. Once the problem starts, the knee osteoarthritis (KOA) remain there with patients for lifetime. None of the available treatment regimes is 100% effective. All patients are not benefitted by the consultation. In view of the chronic unbearable nature of symptoms, they keep trying different treatment agencies and regimes. They keep on using drugs available over the counter. Its high prevalence and its moderate-to-severe impact on daily life pose a significant public health problem.19
Osteoarthritis of the knee is a significant contributor to disability and loss of independence. Despite the high prevalence of osteoarthritis, a disabling disease with limited treatment options, there is a paucity of regional studies in women. The present study was undertaken with the following objectives:

- To estimate the prevalence of KOA in women of rural and urban Hoshiarpur.
- To elucidate the correlates of KOA in women of rural and urban Hoshiarpur.

**METHODOLOGY**

The study was conducted in the rural and urban areas of district Hoshiarpur, Punjab (India), between August 2012 and May 2013. Sample size of 400 female residents of rural and urban Hoshiarpur aged 18 and above was decided ($\alpha = 0.05; \beta = 0.20$). Four villages in a subdivision were selected randomly. Urban area of Hoshiarpur was also divided into four zones viz north, south, east and west. Out of each zone, one colony was selected randomly. The sample comprised of urban (200) and rural (200) residents. The data was collected by house to house on a predetermined and pretested format. A semi-structured interview schedule was used to interview the study subjects. Osteoarthritis was considered if a study subject was suffering from knee pain along with one out of these three symptoms morning stiffness lasting 30 minutes or less/crepitus on motion/osteophytes on radiographs. The data collected were analyzed by using Microsoft office excel 2007 and SPSS 16.0. Continuous variables, such as age, disease duration, etc. were expressed as mean ± SD. Ordinal variables, such as social status, were expressed as percentages in each category. Informed written consent was taken from study subjects prior to recruitment. All possible information regarding the study was given to the study subjects.

**RESULTS**

The mean age of the study subjects was 46.58 ± 13.49 and the range was 18 to 88 years. Majority of the respondents belonged to Sikh (50.5%) and Hindu (45.5%) religion. Most of the participants were housewives (80.8%). Majority of the respondents belonged to nuclear type of families (74.75%). Majority of them (59.8%) were from upper middle socioeconomic class (Table 1).

Seventy eight (rural-35, urban-43) of the 400 sampled study subjects fulfilled the classification criteria for knee OA. The estimated average prevalence of symptomatic knee OA was found 19.5% in district Hoshiarpur. The prevalence was 17.5 and 21.5% in rural and urban Hoshiarpur respectively. Prevalence was found to be higher among retirees (86.66), though it was not statistically significant. Most of the respondents were literate (85.5%). Majority of the respondents were educated up to high (23.5%), secondary (21%) or tertiary (20.75%) level of education. The prevalence was found high in less educated study subjects (27.47%). The prevalence was significantly associated with age, educational level and menopause ($p < 0.05$).

**DISCUSSION**

The overall prevalence of knee osteoarthritis of 19.5% in the present study was within the range of 17 to 60.6% reported across the country and in other countries. However, this prevalence was lower than some previous studies conducted in India (56.6%). Other studies showing higher prevalence for osteoarthritis are from Amritsar,1 Aligarh22 with prevalence of 60.6 and 30.2% respectively. However, prevalence observed in our study was higher than that found in Shanghai, China23 for symptomatic knee osteoarthritis (7.2%). In these studies, the age groups taken in the sample were above 40 years of age. However in the present study, sample included subjects age group of 18 to 55+ years. This may be the reason for lower prevalence in the present study. Moreover, the prevalence was found statistically significant with age.

Though in the present study urban women had higher prevalence (21.5%) of knee osteoarthritis as compared to rural women (17.5%), the difference was not significant. Our findings support the previous studies done in UT Chandigarh among elderly in year 1999, which revealed a significant difference between prevalence of KOA in rural (32.6%) and urban (60.3%) areas. The low prevalence among rural area could be due to more physical work, higher tolerance, less obesity, diet and lifestyle.20 On the contrary, Andrianakos (2006) reported that symptomatic knee OA was significantly more common in the rural compared to urban and suburban populations in Athens, Greece.16

In our study it was observed that the percentage of people with osteoarthritis increased as the age increased. Maximum prevalence was found in the age group of above 55 years (39.44%). Age was found to be significantly associated with knee osteoarthritis. This finding is similar to those of the studies conducted in South Delhi,24 Dharwad25 and at other places.20-28 The Framingham study represented one of the earliest studies to associate increasing age with worsening knee arthritis.

In the present study, educational status was found to be significantly associated with prevalence of KOA. Less educated study subjects were found to have more prevalence than literates. The reason may be that literate individuals have more awareness about symptoms of disease and they may be more concerned about their health. These findings were similar with previous studies which also quoted that low educational attainment.
(≤12 years) was associated with higher prevalence of knee osteoarthritis. Women with low educational attainment had 50% higher odds of having radiographic knee osteoarthritis and 65% higher odds of symptomatic knee osteoarthritis as compared to those with higher education. Association of higher prevalence of arthritis with less education was also shown by Dunlop et al in their study on non-Hispanic Whites, non-Hispanic Blacks and Hispanics. A similar study in North Carolina was done on non-Hispanic Whites and African Americans revealed that White participants with less than a high school (HS) degree living with high poverty had 1.55 times the odds of reporting arthritis compared with White participants with more than a HS degree and low poverty rates. African American participants with less than a HS degree and high poverty rates had 2.06 times the odds of reporting arthritis compared with African American participants with more than a HS degree.

In this study, prevalence of knee osteoarthritis was found to be high among menopausal women (29.71%). It is evident that prevalence of OA increases during menopausal age. Salve et al (2010) reported high prevalence of knee osteoarthritis as 47.3% among perimenopausal women in South West Delhi. Many studies have shown that loss of estrogen at the time of menopause increases the women’s risk of getting osteoarthritis. There are multiple physiopathological mechanisms involved in osteoarthritis. Among them those related to sex hormones particularly estrogens fulfill a relevant role in maintaining the homeostasis of articular tissues and of the joint. There is a dramatic rise in osteoarthritis prevalence among postmenopausal women. Some studies have also shown significant protective effect of estrogen replacement therapy (ERT) for knee osteoarthritis.

No association was found between prevalence and socioeconomic status, in the present study. This study contradicts the findings of Dunlop et al and Dalstra et al which have shown that prevalence of KOA increased with poverty.

In our study, prevalence was found to be high among retirees (86.6%). This high prevalence may be because of their older age. Therefore, age may have been a confounding factor. Cooper et al suggested that knee OA was significantly elevated in subjects whose main job entailed

<table>
<thead>
<tr>
<th>Sociodemographic variable</th>
<th>No. of respondents surveyed</th>
<th>Individuals with KOA</th>
<th>Prevalence (%)</th>
<th>p-value</th>
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<tr>
<td>Area</td>
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<td>Rural</td>
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<td>*Age group</td>
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<td>7.97</td>
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*Significantly associated with KOA, Chi-square test applied; KoA: Knee osteoarthritis
more than 30 minutes per day squatting or kneeling, or climbing more than ten flights of stairs per day. The increase in risk associated with kneeling or squatting appeared to be more marked in subjects whose jobs entailed heavy lifting.

CONCLUSION

The prevalence of KOA found to be 19.5% in district Hoshiarpur, Punjab. KOA prevalence in urban area was higher (21.5%) than rural area (17.5%). Association between KOA prevalence and age was found to be significant which revealed that KOA prevalence increased with increase in age. Prevalence was higher in woman with menopause. Educational status was also found to be significantly associated with prevalence of the disease. Women with higher education have less prevalence of KOA than illiterate/less educated counterparts.

REFERENCES


