A prospective study of relationship between age and BMI on osteoarthritis in geriatric patients in a tertiary care hospital

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Abstract

Background: Osteoarthritis (OA) is the most common joint disorder in India. Among adults 60 years of age or older the prevalence of symptomatic knee OA is approximately 10% in men and 13% in women. The number of people affected with symptomatic OA is likely to increase due to the aging of the population and the obesity epidemic. **Materials and Methods:** The observational prospective study was conducted in the Department of Orthopaedics, Yenepoya Medical College, and Mangalore from January 2020 to December 2020 (1 year). The interview was structured as follows, data was recorded on a standardized predesigned and a pretested questionnaire. Questionnaire focused on possible risk factors (age, family history, obesity, physical activity, and occupational knee bending and knee injury). **Results:** In this study 100 patients were enrolled in the study, out of 100 patients, 42 (42%) were male, 58 (58%) were females. Age distribution 60-65 years, 66-70 years, 71-75 years, 76-80 years as follows 18(18%), 22(22%), 27 (27%), 33 (33%) as follows. 58 (58%) participants were affected by knee osteoarthritis. In 60-65 years out of 18 participants 5 (5%), in the 66-70 years, out of 22 participants 12 (12%) participants, In 71-76 years, out of 27 participants 19(19%) and 76-80 years, out of 33 participants 22(22%) were affected with the knee osteoarthritis. It shows that in advanced age prevalence of knee osteoarthritis significantly increases. As per the BMI of participants in a group of BMI (18.5- 24.99) out of 28, 16 (16%) participants were affected with knee arthritis as given in Table 4. Participants with a BMI ($\geq$ 25) out of 30, 20 (20%) participants were affected by knee osteoarthritis which is significantly more. **Conclusion:** The worldwide prevalence estimate for symptomatic OA is 9.6% among men and 18% among women. In our study we observed that there is relationship between age, sex and BMI with OA. The number of people with OA increased as the age increased; hence it is likely that if preventive measures can be taken in the earlier age groups OA can be prevented.
Key Words: Osteoarthritis, obesity, BMI.

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INTRODUCTION

Osteoarthritis (OA) is the most common joint disorder in India. Among adults 60 years of age or older the prevalence of symptomatic knee OA is approximately 10% in men and 13% in women. The number of people affected with symptomatic OA is likely to increase due to the aging of the population and the obesity epidemic.[1] Pain from OA is a key symptom in the decision to seek medical care and is an important antecedent to disability.[2] Because of its high prevalence and the frequent disability that accompanies disease in major joints such as the knee and hip, OA accounts for more difficulty with climbing stairs and walking than any other disease. OA is also the most common reason for total hip and total knee replacement.[3] The rapid increase in the prevalence of this already common disease suggests that OA will have a growing impact on health care and public health systems in the future.[4] Weight excess is considered to be a modifiable risk

factor for OA.[4] Body weight reduction has been recommended as an important component of OA treatment. There are reports of reduction in pain and physical disability in patients with OA and weight excess after moderate reduction in body weight.[5] In addition to the mechanical overload produced by the excessive weight, there is a possible influence of adipocytokines and altered carbohydrate and lipid metabolism, that may generate characteristic changes of a chronic inflammatory state observed in these patients.[6] A recent study compared obese and non-obese elderly individuals with knee OA based on the body mass index (BMI), and showed the obese ones presented less functional mobility, slower gait speed, higher pain intensity, and difficulty in performing daily living activities when compared to those with a healthy weight. Nonetheless, the sample was relatively small (n=35), and the authors recognized that a body composition assessment could bring more accurate results, since the isolated use of the BMI does not allow differentiation between fat and lean mass.[7] Old age, female gender, overweight and obesity, knee injury, repetitive use of joints, bone density, muscle weakness, and joint laxity all play roles in the development of joint OA. Pain and other symptoms of OA may have a profound effect on quality of life affecting both physical Function and psychological parameters. Determination of risk factors particularly in the weight-bearing joints and their modification may reduce the risk of OA and prevent subsequent pain and disability, however, the association of these risk factors (age, gender, BMI) with the presence of symptomatic OA has been less studied.[8] The objective of the study was to estimate the prevalence of knee osteoarthritis among females in age group of 60 to 80 years and to assess the association of age and weight of patient with knee osteoarthritis.

MATERIALS AND METHODS

Study Location: The observational prospective study was conducted in the Department of Orthopaedics, Yenepoya Medical College, Mangalore.

Study Duration: January 2020 to December 2020 (1 year).

The interview was structured as follows, data was recorded on a standardized predesigned and a pretested questionnaire. Questionnaire focused on possible risk factors (age, family history, obesity, physical activity, and occupational knee bending and knee injury). Measurements like height, weight and body mass index (BMI) were recorded. The results were analyzed using SPSS software version 20 Chi square test. A total of 100 interviewed subjects referred having knee pain on prevalence day, which were eligible, based on the inclusion criteria were enrolled in the trial after obtaining their informed consents. Patients enrolled into study were given the information sheet having details about the nature of the study. All the patients were clinically assessed and diagnosed on the basis of thorough history, clinical and radiological examination of the affected joint. Out of 100 patients, 58 were female and 42 were male. Their ages ranged from 60-80 years. Radiographs were read by a radiologist who specializes in bone and joint radiology, and were graded 0-4 according to the scale described by Kellgren and Lawrence. OA was defined as grade 2 changes (definite osteophytes), or higher, in either knee.

Inclusion criteria

Clinically and radiologically diagnosed patients of knee joint Outpatients of either sex, Patients in the age group 60-80 years and Patients who agreed to sign the informed consent form and full-filled (ACR) of the clinical criteria being classified as knee OA.

Exclusion criteria

Patients below the age of 60 years and above 80 years, Patients with any systemic illness, mentally retarded person, Patients who failed to give consent.

As per the definition of OA knee classified by American college of Rheumatology (ACR) for OA by Clinical Criteria which was used in our survey for the ascertainment of cases. A person was thus classified as having knee pain suggesting OA if he answered affirmatively to "Have you had pain on either knee for most of the time in the previous month?" and also presented with four or more of the following criteria: 1) age over 60, 2) morning stiffness shorter than 30 minutes, 3) knee crepitus on active joint motion, 4) pain when making pressure at bony margins of the joint, 5) bony joint enlargement, and 6) absence of clear signs of inflammation. These ACR clinical criteria have previously shown good operational properties, with a sensitivity of 84% and a specificity of 89% for identifying OA.

RESULTS

In this study 100 patients were enrolled in the study, out of 100 patients, 42 (42%) were male, 58 (58%) were females. Age distribution 60-65 years, 66-70 years, 71-75 years, 76-80 years as follows 18(18%), 22(22%), 27 (27%), 33 (33%) as follows.

Table 1: Age distribution

S.No	Age Group	Male N (%)	Female N (%)	Total
1	60-65 years	8 (8%)	10 (10%)	18
2	66-70 years	9 (9%)	13 (13%)	22
3	71-75 years	11 (11%)	16 (16%)	27
4	76-80 years	14 (14%)	19 (19%)	33
5	**Total**	**42 (42%)**	**58 (58%)**	**100**

In this study, 60% of females and 40% of males affected with knee osteoarthritis.

Table 2: Prevalence of knee osteoarthritis among participants as per age

S.No	Age Group	Patients with osteoarthritis	Patients without osteoarthritis	Total
1	60-65 years	5 (5%)	13 (13%)	18
2	66-70 years	12 (12%)	10 910%)	22
3	71-75 years	19 (19%)	8 (8%)	27
4	76-80 years	22 (22%)	11 (11%)	33
5	**Total**	**58(58%)**	**42(42%)**	**100**

Table 2 shows that 58 (58%) participants were affected by knee osteoarthritis. In 60-65 years out of 18 participants 5 (5%), in the 66-70 years, out of 22 participants 12 (12%) participants, In 71-76 years, out of 27 participants 19(19%) and 76-80 years, out of 33 participants 22(22%) were affected with the knee osteoarthritis. It shows that in advanced age prevalence of knee osteoarthritis significantly increases.

Table 3: Relationship between Socioeconomic status and knee osteoarthritis

S.No	Socioeconomic status	Patients with osteoarthritis	Patients without osteoarthritis	Total
1	High	8 (8%)	7 (7%)	15
2	Upper Middle	15 (15%)	11 (11%)	26
3	Lowe middle	24 (24%)	15 (15%)	39
4	Poor	6 (6%)	5 (5%)	11
5	Very poor	5 (5%)	4 (4%)	9

The socioeconomic status was associated with knee osteoarthritis, in this study Lower middle class was highly affected with knee osteoarthritis 39 (39%), followed by upper middle 26(26%), high 15(15%), poor 11(11%), very poor 9(9%).

Table 4: Knee osteoarthritis among participants as per BMI (Body Mass Index).

S.No	BMI	Patients with osteoarthritis	Patients without osteoarthritis	Total
1	<18.5	16	12	28
2	18.5-24.99	20	10	30
3	≥25	28	14	42
4	**Total**	**64(64%)**	**36(36%)**	**100**

As per the BMI of participants in a group of BMI (18.5- 24.99) out of 28, 16 (16%) participants were affected with knee arthritis as given in Table 4. Participants with a BMI (≥ 25) out of 30, 20 (20%) participants were affected by knee osteoarthritis which is significantly more.

DISCUSSION

In present study it was found that in the age group of 76-80 years of age were having significantly more prevalence 22% of knee osteoarthritis, 66-70 years of age patients has 19%, 66-70 years of age patients 12%, 60-65 years age patients has 5% of knee osteoarthritis. Approximately one-fourth of the study subjects were suffering from knee pain, of which 88% of individuals were diagnosed with KOA for the purpose of this study. The number of KOA cases was found to be increased with the age. The proportion of the cases was more in lower middle (24%), upper middle socioeconomic (15%), high socioeconomic status (8%), poor 6(6%), followed by very poor 5(5%). It was observed that the percentage of patients affected with osteoarthritis increased as the age increases. OA was more in women compared to men in our study (60% vs. 40% respectively). This difference can be possibly due to the lack of physical activity, mobility, social issues especially in our region and higher prevalence of obesity among women in general. A similar observation was also made in a study done by Sharma M.K *et al.* which was 70.1% vs 41.6%. In our study it was observed that men were less in number compared to women for any given age group.[9,10]

CONCLUSION

The worldwide prevalence estimate for symptomatic OA is 9.6% among men and 18% among women. In our study we observed that there is relationship between age, sex and BMI with OA. The number of people with OA increased as the age increased; hence it is likely that if preventive measures can be taken in the earlier age groups OA can be prevented. Awareness among the community regarding onset of the osteoarthritis is necessary with screening of onset of disease in the elderly. To delay and halt the progression of the disease it is necessary to provide the specific information regarding regular exercise, weight control.

REFERENCES

1. Ratzlaff CR; Lifetime Physical Activity and Osteoarthritis. Phd Thesis, The University of British Columbia, Vancouver, 2011.
2. Zhang Y, Jordan JM; Epidemiology of Osteoarthritis. Clin Geriatr Med., 2010; 26(3):355–369.
3. Patil PS, Dixit UR, Shettar CM; Risk factors of Osteoarthritis Knee–A Cross-sectional study. IOSR Journal of Dental and Medical Sciences, 2012; 2(5): 8-10.
4. Altman R, Asch E, Bloch D, Bole G, Borenstein D, Brandt K. *et al.*; Development of criteria for the classification and reporting of osteoarthritis: classification of osteoarthritis of the knee. Arthritis Rheum., 1986;29(8):1039-1049.
5. Brooks P, Hochberg M, for ILAR, OMERACT Outcome measures and classification criteria for the rheumatic diseases. A compilation of data from OMERACT (Outcome Measures for Arthritis Clinical Trials), ILAR (International League of Associations for Rheumatology), regional leagues and other groups. Rheumatology 2001;40 (8): 896-906.
6. Sharma MK, Swami HM, Bhatia V, Verma A, Bhatia SPS, Kaur G. An epidemiological study of correlates of osteo-arthritis in geriatric population of UT Chandigarh. Indian J Community Med. 2007;1(1):77-8.
7. Radha MS, Gangadhar MR. Prevalence of knee osteoarthritis patients in Mysore city, Karnataka. Int J Recent Sci Res. 2015;6(4):3316-20.
8. Kamble VS, Ghodke YD, Dhumale GB, Avchat SS, Goyal RC. Health status of elderly persons in rural area of India. Indian Medical Gazette. 2012: 295- 299.
9. Bhandarkar P, Patil P, Shekhar C, Kamat N. Prevalence of osteoarthritis knee: four year study based on digital records of comprehensive healthcare setup at Mumbai, India. Int J Community Med Public Health. 2016;3:1049-53.
10. Ganvir SD, Zambre BR. Prevalence of Identification of Risk Factors for knee osteoarthritis among elderly men and women. Sch J Appl Med Sci. 2013;1(6):700-3.