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Original Research Article

Prevalence of osteoarthritis knee among elderly in rural field practice area of Rajarajeswari Medical College, Bengaluru, India

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ABSTRACT

Background: The most prevalent kind of arthritis and a highly common disease of the elderly is osteoarthritis (OA). It is a major contributor to disability among elders. The cervical and lumbosacral spine, the hip, the knee, and the first metatarsal phalangeal joint are the joints most frequently afflicted by it. Objective was to estimate the prevalence of osteoarthritis knee and to assess the risk factors associated with osteoarthritis knee among elderly persons in rural field practice area of Rajarajeswari Medical College, Bangalore.
Methods: A cross-sectional study was conducted by visiting house to house among 150 elderly people selected by purposive sampling technique at Chunchunnakuppe village which is located on South Bangalore from June 2023 to July 2023. A detailed clinical examination of knee using American College of Rheumatology (ACR) criteria and Socio demographic information were also elicited.
Results: A total of 150 elder respondents were interviewed out of which 63 (42%) had OA knee. Female gender, history of a knee injury, family history of knee pain, other chronic illness, current physical activity, BMI, and smoking status were found to be significantly associated with knee OA ($p<0.05$).
Conclusions: In the study area, osteoarthritis of the knee was quite prevalent. Some of the modifiable factors like physical activity, smoking, BMI are significantly associated with OA knee.

Keywords: ACR criteria, BMI, Osteoarthritis, Rural area

INTRODUCTION

Osteoarthritis (OA) is an irreversible disorder of the joints that results in pain, stiffness, restricted movement, and impairment. It is associated with aging and more prone to happen in joints that have been stressed out over time. The cervical and lumbosacral spine, hip, knee, and first metatarsal phalangeal joint are the joints that are most frequently impacted by it. Arthritis most commonly occurs as osteoarthritis. The economic impact of OA has increased by thrice or more, particularly among those who have undergone total knee or total hip replacement. In a nationally representative survey conducted in India, joint/pain disorders were identified as the second and fourth most common causes of outpatient clinic visits and out-of-pocket expenses among all non-communicable diseases. Knee OA accounts for almost 80% of the total OA burden globally. Though it does not cause death, it reduces the quality of life (QOL) by producing impairment.[1]

Globally, it is believed that 10%-15% of all persons over the age of 60 have some form of OA, with women having a higher prevalence. According to NHANES III data, the prevalence of symptomatic knee OA in the United States is 12.1%, with 16.3% among Johnston County OA project participants aged 55 to 64. According to data from the Dutch Institute for Public Health, the prevalence of knee OA among individuals aged 55 and up was 15.6% in men and 30.5% in women. A study conducted in the Asian countries of India, Pakistan, and Bangladesh found that

the prevalence of OA knee in rural areas was 13.7%, compared to 6.9% in urban areas. According to community survey data from both rural and urban areas in India, the prevalence of OA ranges between 17% and 60.6%.[2]

The etiology of OA is multifaceted, resulting from the interaction of systemic and local components. Osteoarthritis affects people of all ages. The origin of this devastating disease, which has multiple genes associated to its occurrence. Adolescent athletes are at risk of developing premature osteoarthritis due to sports engagement, joint injury, obesity, and genetic vulnerability. Previous knee trauma increases the risk of osteoarthritis by 3.86 times. Old age, female gender, overweight and obesity, knee injury, repetitive usage of joints, bone density, muscle weakness, and joint laxity are all contributing factors to the development of joint OA. The identification of risk factors, particularly in weight-bearing joints, and their management may lower the likelihood of OA and avoid subsequent pain and disability. Mechanical pressures on the joints are a significant cause of OA and one of the most modifiable risk factors based on body mass index. Female gender, poorer educational levels, obesity, and poor muscular power are all connected with symptomatic disease and subsequent impairment.[3]

Many studies in India have found that osteoarthritis is the second most common rheumatologic condition and the most common joint disease, with prevalence rates ranging from 22% to 39%. OA is divided into two categories: main and secondary. Primary osteoarthritis has no known origin and is mainly the result of aging, but secondary OA is caused by injuries from squatting and kneeling professions. The treatment of OA comprises both pharmaceutical and nonpharmacological treatments. Nonpharmacological methods include education, health awareness, weight loss, the use of braces, and physiotherapy, but pharmacological measures only improve quality of life by relieving pain. Pain relievers, NSAIDs, opioids, and intraarticular corticosteroids are some of the most commonly utilized medications. Surgery is necessary in some circumstances when pharmacological methods fail to alleviate the symptoms.[4]

This study aimed to estimate the prevalence of osteoarthritis knee and to assess the risk factors associated with osteoarthritis knee among elderly persons in rural field practice area of Rajarajeswari Medical College Bangalore.

METHODS

A community-based, cross-sectional study was conducted in arural field practice area of Rajarajeswari Medical College and Hospital, Bengaluru. The study was conducted from June 2023 to July 2023 and pretested validated questionnaire was administered among elderly respondent for diagnosis of OA knee. Persons who is age of 60 years or above who were permanent residents of the study area were included in the study. Elderly who were bed-ridden or diagnosed with knee joint pathology other than OA were excluded from the study.

Sample size

Sample size was calculated by applying the equation $4PQ/d^2$ where "P" was the prevalence of knee OA taken as (64.3%) and taking relative precision (d) and non-response rate as 8%.[1] The final sample size was rounded off to 150.The 150 study subjects were chosen by purposive sampling method. There are 25 villages under rural health training centre of Rajarajeswari Medical College and Hospital among the 25 villages one village has been selected randomly which is Chunchunnakuppe. In that village, a street was selected randomly in a study village after that house was selected by rotating water bottle. The first house was selected in the direction of the water bottle and houses were further sampled continuously from the randomly selected the first house until the required sample size was achieved.

Study tool

OA was defined according to American College of rheumatology (ACR) criteria[5] as knee pain plus at least three of the following: [A] Age more than 50 years, [B] Morning stiffness less than 30 minutes, [C] Presence of crepitus, [D] Presence of bony tenderness, [E] No palpable warmth, and [F] Presence of bony enlargement.

Ethical consideration

Ethical committee approval was obtained from the Institute Ethics Committee. Informed written consent was obtained from all participants before data collection. Before obtaining informed consent, the purpose of the study, benefits of participating, the procedure of maintaining confidentiality, and the right not to participate were explained to the participants. The individuals who were found to have comorbid conditions needing further management were given guidance and counselling before referring them to the hospital.

Statistical analysis

The data was compiled in Microsoft (MS) Excel work sheet and analyzed using SPSS (Statistical Package for Social Sciences) software version 20.0. The descriptive statistics- All qualitative variables were presented as frequency and percentages. All quantitative variables were presented as mean and standard deviation. Chi-square tests of significance was applied to analyse the association between eating disorders and demographic variables. p values of less than 0.05 was considered statistically significant.

RESULTS

A total of 150 elder respondents were interviewed, out of which 63 (42%) had OA knee (Figure 1) of which male 22 (15%) and female 41 (27%) had OA knee (Figure 2). The mean age of the elderly was 68.7 years (SD:±6.64). The majority of the elderly 81 (54%) were female, and 69 (46%) were male. Among the religion, 137 (91%) were Hindus and 13 (9%) were Muslim. The majority of the elderly 144 (96%) were married and 6 (4%) were seperated. Considering socioeconomic status, the most of the study participants 83 (55%) belongs to upper middle class, next highest 44 (29%) belongs to middle class.

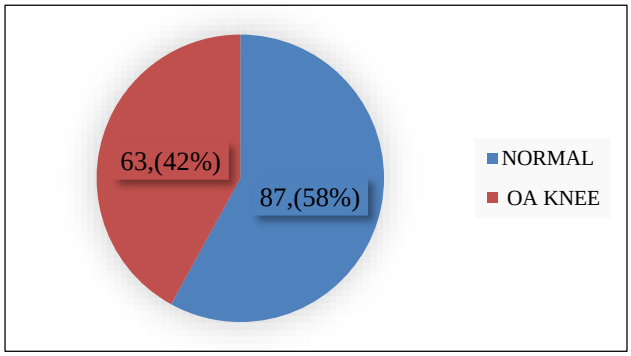

Figure 1: Prevalence of OA knee among the study participants.

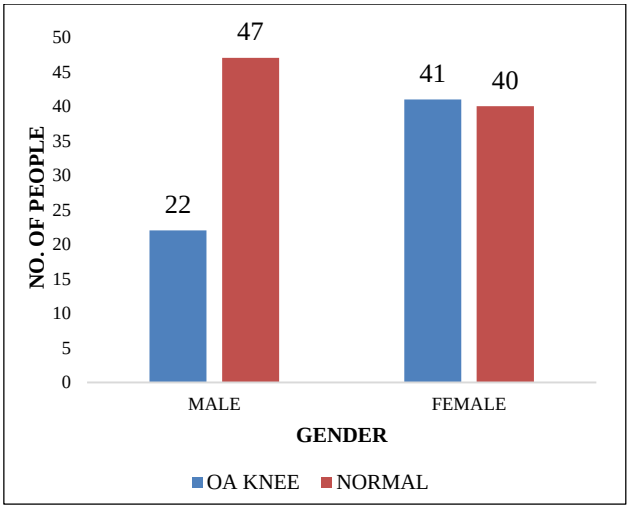

Figure 2: Bar chart showing gender wise distribution of osteo arthritis knee.

Among 150 elderly, 63 (42%) had OA knee of which 43 (28.6%) had bilateral knee OA and 20 (13.4%) had unilateral knee OA. Female gender, BMI, current physical activity, family history of knee pain, history of knee trauma, other chronic illness and smoking were found to be associated with OA knee ($p<0.05$). No significant association was found for age, socio-economic status and alcohol (Table 1).

Table 1: Association between demographic variables and OA knee.

Variables	Status	OA knee	Normal	Chi square	P value
Sex	Male	22	47	5.367	0.02*
	Female	41	40		
Socio economic status	Upper class	2	6	1.785	0.7751
	Upper middle class	34	49		
	Middle class	21	23		
	Lower middle class	4	5		
	Lower class	2	4		
Age (years)	60-69	41	59	0.1232	0.72564
	70 and above	22	28		
Current physical activity	Yes	9	50	28.55	<0.00001*
	No	54	37		
Other chronic illness	Present	57	27	52.39	<0.00001*
	Absent	6	60		
History of trauma	Present	14	7	6.0991	0.013*
	Absent	49	80		
Family history of knee pain	Present	43	14	42.199	<0.00001*
	Absent	20	73		
Alcohol	Yes	11	10	1.0802	0.29864
	No	52	77		
Smoking	Yes	26	15	10.62	0.001*
	No	37	72		
BMI	Underweight (<18.5)	5	27	22.013	0.0006*
	Normal (18.5-22.9)	23	41		
	Overweight (23-24.9)	19	12		
	Obese (>25)	16	7		

*Statistically significant

DISCUSSION

In the present study the prevalence of OA knee was 42% (Figure 1). When compared to Indian studies, the results were similar with the study done by Singh et al (41.1%).[6] When compared with Asian countries, the results were comparable with the study done by Kim et al (37.3%).[7] The results were comparable to the present study in the study done by Dillon et al where the prevalence was 37.4%.[8] The prevalence was slightly higher (66.1%) in the study done by Ganvir et al among elders in Ahmednagar (M.S), India.[9]

In the present study 21% of study participants had BMI in overweight category and 15% in obese category. A study done by Kuptniratsaikul et al on epidemiology of osteoarthritis knee among elders reported 28.8% were overweight and 8.4% were obese category.[10]

In the present study, the number of study participants with OA knee was found more in female and gender specific was significantly associated with OA knee. A study done by Nandish et al where OA knee was found more in female where the gender association with OA knee differs from present study which statistically not significant.[11]

The study done by Sharma et al, where BMI who had overweight, obese and elders with less physical activity are significantly associated with OA knee.[12] Similar results were observed in the present study where BMI who had overweight, obese and elders with less physical activity are significantly associated with OA knee.

CONCLUSION

The prevalence of OA knee was high among elders in the study area. The following factors were significantly associated with OA knee (P 0.05): female gender, BMI, current physical activity, family history of knee pain, history of knee trauma, other chronic illness, and smoking.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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