

Prevalence Study of Knee Osteoarthritis in an urban population of West Bengal

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ABSTRACT

Background: Osteoarthritis (OA) also known as degenerative joint disease and global statistics reveals over 100 million people worldwide suffer from OA disability. **Objectives:** To assess the association of body somatotype with knee OA gradations and to identify the prevalence of socio-demographic status on Knee OA (KOA). **Material & Methods:** 200 patients (male and female) were comprised in this cross sectional study. They were radiologically tested as KOA patients. **Basic physical parameters** were measured by standardized procedures. **Result:** Overweight to obese patients were more prone to onset of KOA. Housewife female persons were suffering more in KOA than other professionals whereas sales workers male persons were more tends to onset of KOA than other associates. **Conclusion:** Female are more prone to KOA than male persons as they were passing through menopause state. In case of female patients, obesity or overweight is not only cause for KOA onset. Basically housewives are used to do squatting frequently that might be a cause of KOA. It can largely be avoided by lifestyle changes.

Keywords: Knee Osteoarthritis, BMI, Overweight, squatting.

I. INTRODUCTION

Osteoarthritis (OA) also known as degenerative joint disease is the most common form of arthritis. It is characterized by the destruction of articular cartilage which results in development of joint pain, swelling, stiffness and limitation of movements. It causes chronic disability. According to the site involvement the degree of disability varies greatly between the individuals. ⁽¹⁾ Global statistics reveals over 100 million people worldwide suffer from OA, which is one of the most common causes of disability. ⁽²⁾ Hence Epidemiological status of this disease in India is not clear. It is estimated that OA is the common rheumatological problem, as well as the frequent joint disease with prevalence of 22% to 39% in India. ⁽³⁾ In all types of degenerative arthritis conditions Knee OA is the most common. According to WHO the worldwide burden of disease reported that knee OA alone is most important cause of disability for both men and women. Women are more sufferer than men; the ratio is 2:1⁽⁴⁾. Knee OA was an important contributor for global disability among the other osteoarthritis ⁽⁵⁾ and it contributed for 83% of the global disease burden for osteoarthritis. ⁽⁶⁾ Prevalence of Knee OA in India is about 28.7%. ⁽⁷⁾ There are many predisposing factors which causes the development Knee OA such as age, gender, family history, previous injury, certain occupations, other medical conditions, other types of arthritis, lack of activity, stress and so on. Though, there is no such literature review based on knee OA in India, especially in West Bengal area. Hence the aim of the present study was to estimate the prevalence of radiographic knee OA and predisposing factors for knee OA in an urban community.

II. OBJECTIVES

So, under these circumstances, the purpose of this study is

- To assess the association of body somatotype with knee OA gradations.
- To identify the prevalence of socio-demographic status on Knee OA.

III. RESEARCH METHODOLOGY

Selection of the site and sample for the study

This study was a cross sectional study conducted in KCM Clinical Diagnosis and Research Centre, Kolkata, West Bengal. The sample comprised of 200 patients coming from different districts of West Bengal. The selection criteria of the subjects were based on clinical examination and radiologically confirmed subjects by clinician.

Ethical Consideration

This study was performed following the ethical guidelines for biomedical research on human participants as directed by ICMR, Govt. of India and due permission was taking from the Institutional Ethical Committee (IEC) for research on human participant – of University of Calcutta.

Inclusion Criteria

1. Age range $\leq 30-60$ years.
2. Patients were diagnosed as having osteoarthritis of the knees by clinical examination and confirmed radiologically based on Kellgren Lawrence (K-L) scale from 0-4.

Exclusion Criteria

1. Patients who had a total knee replacement, significant hip or spinal arthritis or major concurrent illness were excluded.

All the following parameters were tabulated in following tables.

Table 1: Assessments of different parameters

Serial no	Parameters assessed	Testing method
1.	Height	Anthropometric rod
2.	Weight	Weighing machine
3.	Body Mass Index (BMI)	Calculated by the formula(height/weight ²)
4	Socio economic Status	Kuppuswamy Questionnaire

Statistical Analyses:

Statistical analyses were done by Minitab 16 software. Quantitative variables were expressed as mean+SD. P-values<0.05 were considered to be significant.

IV. RESULT

A total of 200 subjects were enrolled in the study of whom 150 (75%) were females and 50 (25%) were males. In the male: female ratio was 1:3. A majority of female patients were housewife (about 86%) followed by office workers (5.33%), school teacher (3.33%) and others (5.33%). In case male patients' majority of them were belongs to the Service Workers and Shop & Market Sales Workers (38%) followed by associate professionals about 18%. Though all subjects belong to different socioeconomic group, so they have significant difference between anthropometric parameters like weight, body mass index (BMI). Demographic data of age group, physical parameters of the study population were tabulated in following table.

Table 2 Gender wise distribution of Gradation of Knee Osteoarthritis

GENDER						
Gradation of Knee Osteoarthritis	Frequency (Female)	Percentage	Frequency (Male)	Percentage	Frequency (n=200)	Percentage
Grade I	80	53.3%	37	74.0%	117	58.5%
Grade II	54	36.0%	9	18.0%	63	31.5%
Grade III	16	10.7%	4	8.0%	20	10.0%

Table 3 Association between Ages in Years: Gradation of Knee Osteoarthritis

Variable	Female (n=150)			Variable	Male (n=50)		
	Grade I (n=80)	Grade II (n=54)	Grade III (n=16)		Age (y)	Grade I (n=37)	Grade II (n=9)
≤ 30	9	1	0	≤ 30	3	0	0
31-40	16	2	1	31-40	2	1	0
41-50	26	19	2	41-50	11	2	1
51-60	29	32	13	51-60	21	6	3

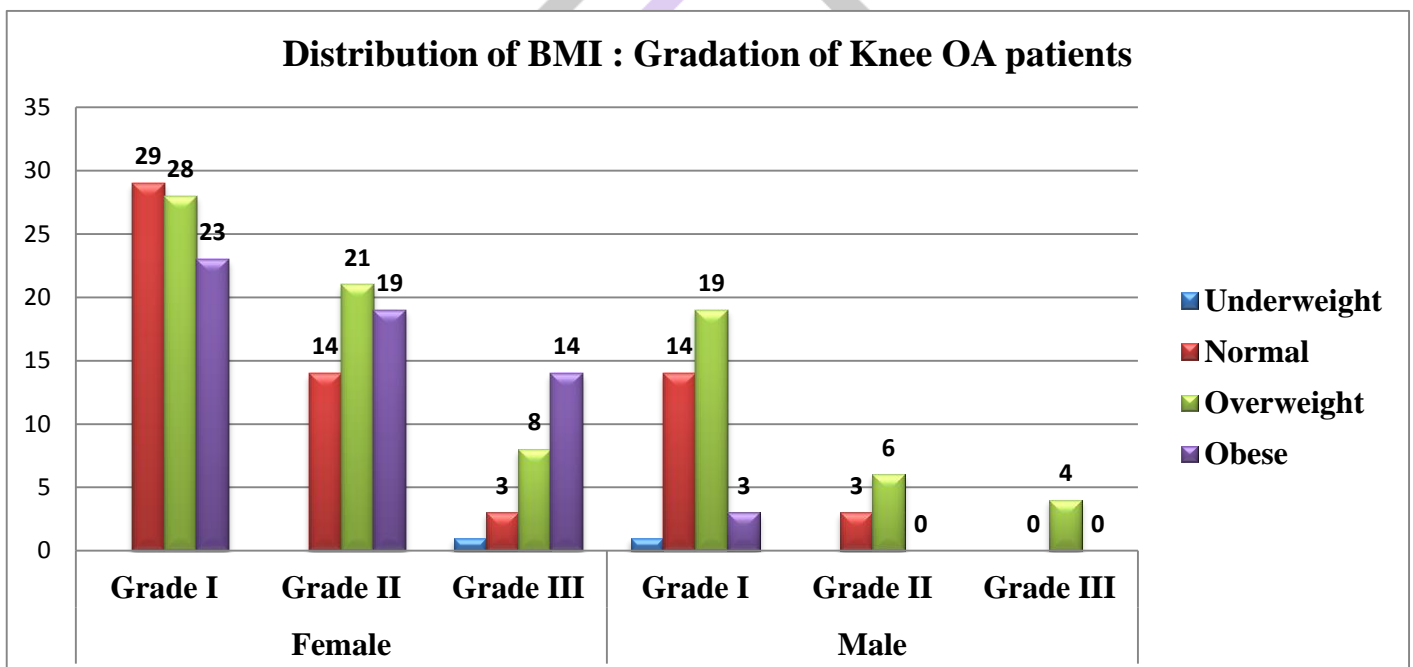
Table 4 Distribution of Socioeconomic Status among Knee OA patients

Socioeconomic Status	Female (Frequency)	Percentage	Male (Frequency)	Percentage
Upper (I)	7	4.66	3	6
Upper Middle (II)	52	34.66	18	36
Lower Middle (III)	75	50	23	46
Upper Lower (IV)	16	10.66	4	8
Lower (V)	0	0	2	4

Table 5 Distribution of Mean of Physical Parameters with the Gradation of Knee Osteoarthritis

Physical Parameters	Female				Male			
	Grade I	Grade II	Grade III	P Value	Grade I	Grade II	Grade III	P Value
Height (cm)	158.02±6.9	155.41±6.4	157.92±7.6	0.051	169.31±5.9	167.4±3.8	162.5±8.03	0.06
Weight (Kg)	68.185±3.06	87.6±12.2	78.65±9.38	0.034	72.87±11.04	73.46±10.1	73.2±9.8	0.042
BMI (Kg/m ²)	27.4713±4.5	33.93±4.71	35.48±3.72	0.024	30.35±2.45	35.37±2.2	32.82±3.75	0.038

Following diagram is Association between Status of BMI: Gradation of Knee Osteoarthritis



V. DISCUSSION

Knee OA is a common condition which represents a major contribution to the burden of physical disability. The only way for reduction of the burden of the disorder is prevention in early stage. Two hundred patients were comprised in this study where 25% were male 75% were female. Literature showed that gender plays a major role in osteoarthritis development. Women are mostly affected than men⁽⁸⁾. Present study also showed the same result with a high prevalence rate amongst female persons and three times the propensity of having knee-OA as compared to males. The probable reason for higher incidence among female patients may be due to their post-menopausal status and habit of constant squatting.^(9, 10) Maximum number of patients were housewives and it was about 86% and it is found to be a sedentary life style and they basically used to household work. During work, they frequently do knee bending and that might be the cause of knee OA onset.^(11, 12)

It was found in the study that majority of subjects complained during Grade I (58.5%) condition of knee osteoarthritis in case of both female and male participants (53.3% and 74.0%). Most of the patients were at the age group of 51-60 years followed by 41-50 years. It was observed that age group and gender (female) were significantly associated with the gradation of Knee Osteoarthritis with a p-value 0.0012 but in case of male patients the age group was not significantly associated with the gradation of Knee OA. The data revealed higher prevalence of knee OA among lower middle class group which is similar to some studies reported increased prevalence among lower socioeconomic status.⁽⁸⁾

Obesity is strongly associated with knee OA. Current study also showed higher prevalence of knee OA among patients with high body mass index.⁽⁸⁾ It was also found in this study that, onset of knee OA is not only depends on BMI in case of female patients. For onset of OA, normal body weight also under consideration. Present study confirms that overweight and obesity are considered

to be potential risk factors for further development of Knee OA for both gender but normal weight does not mean that there will no chances of knee OA development especially for female.

VI. CONCLUSION

Knee osteoarthritis is the disease of high morbidity and mortality. This chronic progressive disorder is a major public health issue affecting the middle aged and elderly dependent population. From the present study, it concluded that females are more vulnerable to develop OA knee in earlier ages than male. So, precautions should be taken for this group of population to protect the Knee joints at early ages. In this study it observed that there is a positive 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. It can largely be avoided by lifestyle changes and by careful about body weight and daily activities.

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