

Factors Contributing to Increase in Knee Osteoarthritis Among Young People of Multan Periphery

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ABSTRACT

Objective: To determine the risk factors of knee osteoarthritis in young patients.

Methods: A total of 100 patients with diagnosis of knee arthritis were included as cases and a similar number of 100 patients who presented to the orthopedic clinic for reasons other than knee arthritis were taken as controls. A study questionnaire was designed to gather information regarding the patient's age, gender, body mass index, physical activity, smoking history and knee injury history.

Results: Mean age was 39.1±6.8 years in study group and 40.2±5.7 years in control group. There were 67 (67%) male patients in cases group and 59 (59%) male patients in control group, p-value 0.24. There were 35% obese patients in cases and 13% in control group (p-value 0.0002). There were 56% smokers in cases and 41% in control group with p-value 0.03. Out of 100, 11% patients in cases and 4.0% in control group had history of knee joint injury (p-value 0.06). 47% patients in cases group and 33% patients in control group were belonged to hardworking occupations, p-value 0.04.

Conclusion: Obesity, history of knee joint injury, smoking and hardworking occupation are risk factors of knee osteoarthritis in young patients.

Keywords: Knee osteoarthritis, young patients, obesity, risk factors.

INTRODUCTION

Osteoarthritis (OA) is a degenerative joint disease that causes pain as well as other structural abnormalities and a gradual loss of articular cartilage. When osteoarthritis affects the entire joint, the only treatment option is a joint replacement surgery. It is the joint condition that affects people more frequently than any other disease in the globe, and it is one of the most common reasons for pain, decreased function, and disability.^{1, 2} It was estimated that the radiographically verified symptomatic prevalence of osteoarthritis of the knee and hip in the world in 2010 was 3.8% and 0.85%, respectively.³ Globally, OA is the thirteenth leading cause of years lost due to disability (DALYs) and the fourth leading cause that increased DALYs from 1990 to 2013.^{4, 5}

There are currently no disease-modifying OA medicines that are approved for use, and osteoarthritis of the knee is the most frequent kind of OA. There is an immediate need for research that studies novel and efficient methods that can either halt the course of knee osteoarthritis (OA) or delay its advancement. Identifying and addressing the early life risk factors that contribute to the development of this significant but little understood public health issue is one of the strategies that can be implemented. It has been discovered that obesity and joint damage are substantially related with osteoarthritis (OA).⁶ In addition, it has been discovered that African-Americans have a higher prevalence of knee osteoarthritis when compared to Caucasians.⁷ When it comes to younger people who are physically active, a higher predisposition to accidents increases the likelihood that they will develop osteoarthritis (OA) proportionately with the amount of time spent participating in occupational and recreational activities. In a study that was conducted in 2011, it was discovered that active duty military personnel had significantly higher rates of osteoarthritis when compared to the same age group in the general population. This finding provides evidence that occupational and recreational activities play a role in the development of OA.⁸ It is commonly believed that osteoarthritis (OA) is caused by "wear and tear," particularly in young people and athletes who put a greater amount of stress on their joints than older people do.⁹

Epidemiological studies of modern populations have a lot of value, but they have certain limitations when it comes to their capacity to examine risk variables that are today widespread but were far less prevalent in the past. The purpose of this research was to identify the characteristics that put young patients at risk for developing knee osteoarthritis.

MATERIALS AND METHODS

A total of 100 patients with diagnosis of knee arthritis were included who presented in the department of orthopedics of Nishtar Hospital Multan from Jan-2022 to Jan-2023. Patients of age 20-55 years who were diagnosed of having knee osteoarthritis on X-rays and other radiological modalities were included. While a similar number of 100 patients who presented to the orthopedic clinic for reasons other than knee arthritis were taken as controls. Patients with congenital anomalies of legs were excluded from analysis. Approval from hospital IRB was obtained.

A study questionnaire was designed to gather information regarding the patient's age, gender, body mass index, physical activity, smoking history and knee injury history. If the patient was educated then the printed version of questionnaire was handed over to the patients to be filled and returned back. If the patient was uneducated then the researcher asked him/her all the relevant questions and the questionnaire was filled by the researcher on behalf of the patient.

Chi-square test was applied to compare risk factors of knee osteoarthritis between the groups taking p-value ≤0.05 as significance difference.

RESULTS

Mean age was 39.1±6.8 years in study group and 40.2±5.7 years in control group. There were 67 (67%) male patients in cases group and 59 (59%) male patients in control group, p-value 0.24.

Regarding risk factors, obesity, smoking history, history of joint injury and hardworking occupation were found to be significant factors. There were 35% obese patients in cases and 13% in control group (p-value 0.0002). There were 56% smokers in cases and 41% in control group with p-value 0.03. Out of 100, 11% patients in cases and 4.0% in control group had history of knee joint injury (p-value 0.06). 47% patients in cases group and 33% patients in control group were belonged to hardworking occupations, p-value 0.04 (Table 1).

Regular sports activity: patients having routine habit of running, gymnasium, playing cricket/badminton/football and other athletic activities. Hardworking occupation; patients working in mining, digging, and weight lifting in routine work job.

Table 1: Risk Factors of Knee Arthritis.

	Cases (N=100)	Controls (N=100)	P-value
Obesity			
Yes	35 (35%)	13 (13%)	0.0002
No	65 (65%)	87 (87%)	
Smoking History			
Yes	56 (56%)	41 (41%)	0.03
No	44 (44%)	59 (59%)	
History of Knee joint Injury			
Yes	11 (11%)	4 (4.0%)	0.06
No	89 (89%)	96 (96%)	
Regular Sports Activity			
Yes	31 (31%)	34 (34%)	0.65
No	69 (69%)	66 (66%)	
Hardworking Occupation			
Yes	47 (47%)	33 (33%)	0.04
No	53 (73%)	67 (67%)	

DISCUSSION

This is the first study conducted in Pakistan in which we have tried to determine the risk factors of knee arthritis. It is generally accepted that knee injury is a significant risk factor for the development of knee OA. However, most of the proof comes from case-control studies of OA in middle-aged and elderly people.¹⁰ A person's future risk of OA after a joint injury can be estimated more accurately if more is known about their risk profile.¹¹ In this study, history of knee injury was the significant factor of knee arthritis.

In addition, the findings of this study suggest that young men and women had a comparable chance of acquiring clinically significant knee osteoarthritis in the aftermath of knee injuries. In contrast to this, a systematic review and meta-analysis found that men had a greater chance of developing knee osteoarthritis (OA) following knee injury, despite the fact that the confidence intervals for this finding were extremely broad.¹² In this study, there was little higher proportion of males than female patients who presented with knee arthritis.

There is a correlation between obesity and osteoarthritis of the knee more so than other joints. It is still entirely unknown whether or not obesity in childhood is a risk factor for OA in later life. The fact that being overweight as a child is a reliable indicator of being obese as an adult lends significance to the condition.¹³ In a study, researchers found that obese adults were 18 times more likely to come from a background of being overweight as adolescents.¹⁴ The presence of obesity during childhood was a powerful indicator of obesity during the early years of adulthood.¹⁵ Because of this tracking of obesity, it is impossible to determine whether or whether obesity in childhood independently increases the risk of OA. According to Wills and colleagues' research, being obese from a young age may have a snowball effect on the development of knee osteoarthritis.¹⁶ When males were as young as 20 years old and women were as young as 15 years old, their body mass index (BMI) was connected with an elevated risk of knee osteoarthritis (OA) when they were 53 years old. According to the findings of this study, an increase in BMI from childhood onward in women and from adolescence onward in males was found to have a favorable correlation with knee OA.¹⁶

Physical activity is recommended for people with knee OA in the guidelines for the nonsurgical therapy of knee OA because it helps alleviate pain and boosts physical function.¹⁷ However, there is disagreement regarding whether physical activity and fitness have a negative,¹⁸ a positive,¹⁹ or no influence on the onset and course of OA.²⁰ Uncertainty about the causes of this dispute may be related to the retrospective nature of these studies and their inability to account for the confounding role of injury, which raises the chance of developing OA.²¹ It's also likely that knee structures function differently depending on the type of exercise and stage of life. There is insufficient evidence to support the claim that healthy articular cartilage in vivo responded favorably to physical loads while deteriorated cartilage negatively responded.²² Similar to humans, physical activity early in life benefits cartilage development in

hamsters but has negative effects on cartilage later in life, increasing the prevalence of OA.²³ In this study there was no association of physical activity with knee arthritis, however working in hard occupations was significantly associated with risk of arthritis.

We would like to draw attention to a few significant limitations. Strong risk factors for knee OA include obesity.²⁴ Even while this association is not entirely evident, it may also be linked to the risk of joint damage.²⁵ The present study's limited sample size and cross-sectional design are its other limitations.

CONCLUSION

Obesity, history of knee joint injury, smoking and hardworking occupation are risk factors of knee osteoarthritis in young patients.

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