



**Radiographic Patterns of Hip and Knee Osteoarthritis in
Tikur Anbessa Specialized Hospital,
Addis Ababa ,Ethiopia**

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Acronyms

AAU: Addis Abeba University

ACR: American College of Rheumatology

BMI: Body Mass Index

JSN: Joint Space Narrowing

OA: Osteoarthritis

PI: Principal Investigator

TASH: TikurAnbessa Specialized Hospital

WHO: World Health Organization

ABSTRACT

Background

Osteoarthritis (OA) is the most common chronic rheumatic disorder in the world. It results in joint pain, tenderness and significant disability. OA of hip and knee is very important in terms of its public health significance. Significant morbidity and disability usually results from OA of these sites. Although OA is common, the radiologic and socio demographic patterns vary among different studies. Information obtained from studies of the radiologic and socio demographic pattern of the disease in different regions can help in interventional programs aimed at prevention and control. It will also help as source of reference for radiologists, orthopedists, rheumatologists, resident and medical students.

OBJECTIVE:

The objective of this study is to determine the pattern of hip and Knee OA among patients being treated in TASH.

Materials and Methods:

Hospital based descriptive cross sectional study was conducted on 204 Hip and Knee Osteoarthritis patients in TASH to determine the pattern of hip and knee OA. Interviewer-administered structured questioner was used in data collection. Data was cleaned for completeness and then entered into SPSS version 25 manually then analysis was done.

Results:

A total of 204 patients with Hip and Knee osteoarthritis were studied. 68% of the participants were female and 32% were male. Of these patients 150 had isolated knee OA and 42 had isolated Hip OA and 12 had combined Hip and Knee OA.. The mean age was 54.6years. Among Knee OA Obese participants were 35.2% and 43.2 were overweight. Among Hip OA Obese Participants were 13% and 51.9% were overweight. There were 90 (80.3%) participants with bilateral knee disease while 27 (73%) had bilateral hip disease. Obesity was more common in participants with knee than in Hip arthritis with P value - 0.046.

Conclusion:

The study showed that Knee OA was more common than Hip OA, and MTF compartment involvement was more common followed by PTF compartment involvement. Females and middle aged were more commonly affected by OA. Majority of patients were obese and overweight. Obesity is modifiable risk factor for knee OA so it can be made valid target for preventing OA.

1. Introduction

1.1 BACK GROUND

Osteoarthritis (OA) is the most prevalent chronic rheumatic disorder in the world (1). The Subcommittee on Osteoarthritis of the American College of Rheumatology Diagnostic and Therapeutic Criteria Committee defined osteoarthritis (OA) 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" (2). OA can occur in any joint, but most commonly in joints of hand, spine, knee, foot and hip. Knee being the most frequently affected (3)

The clinical manifestations are joint pain, limitation of movement, tenderness, creptus and variable degree of local inflammation. Pathologically OA is defined as a focal loss of articular cartilage in synovial joint with adjacent bone production changes like osteophytes and subchondral sclerosis. Basically it is a reaction to synovial injury. These changes start to be visualized by radiography when the severity increases. (3)

The estimated population prevalence varies from 4-30%. The prevalence depends on the age, sex distribution and the disease definition. It is estimated to be the fourth leading cause of disability in most countries worldwide. In fact its prevalence is increasing as populations are aging and obesity is increasing (5)

In some studies done in Africa OA is the most common chronic rheumatic disorder. The reasons given were the increasing life expectancy. There were slight differences from western studies in terms of age, where earlier age is seen in African studies. However studies show similarity in sex pattern where female predominance is seen in both. Knee joint is also predominantly affected in these studies. However the burden of OA is estimated to be greater in African countries because treatments like arthroplasty and joint replacement are not as equally and as readily available. (4)

OA Patterns vary by age, sex, ethnicity, and BMI. With regard to age, it is more prevalent in older part of the population (4). The prevalence of OA increases as age increases because OA is a progressive non-reversible disease. With regard to sex there are various different reports, but generally females are more frequently affected in older age groups and men are more affected on younger age groups, with exception of hip OA. (4)

The most common joint sites affected by OA are spine, hand, hip and knee. From these OA of hip and knee are most relevant in view point of public health, and especially based on

their prevalence and associated disability. Knee OA is the most common form and it is associated with profound clinical and public health burden (6).

However, it is difficult to diagnose OA. In fact it has remained mysterious for the clinicians and radiologists. This is because OA is a complex disease process with combination of systemic and local mechanisms resulting in characteristic pathological and radiologic changes which often but invariably associated with symptoms and disability. Definitions of osteoarthritis may therefore be based upon any combination of clinical features, radiographic changes and pathological findings, be it in joint tissue, synovial fluid or blood. The method should ideally be accurate, reproducible, noninvasive, convenient and relatively inexpensive. A radiographic system for assessing osteoarthritis would, if appropriately validated, meet these criteria(7)

Radiography is commonly used in the evaluation for arthritis . The presence of osteophytes, bone sclerosis, and subchondral cysts and the absence of inflammatory features such as erosions suggest osteoarthritis. With regard to the knee joints, joint space narrowing is typically asymmetric and most commonly involves the medial tibio-femoral compartment, possibly with the patella-femoral compartment . Similarly, hip joint space narrowing is asymmetric, with superior migration of the femoral head more common than medial migration. Underlying acetabular dysplasia is associated with super lateral migration(8)

Osteoarthritis is usually described by its radiologic appearances. Severity may be graded based on the 0-4 scale developed by Kellgren and Lawrence. A Kellgren and Lawrence radiological OA score of 2-4 is still the most widely used definition of radiological OA in epidemiological studies . Because symptoms of OA are non specific there is no validated clinical definition of OA.(9). The problem with only using radiological classification of OA is that it overestimates the burden of OA compared to the Clinical manifestations and disability status. However radiologic classification compared to the pathologic of OA underestimates the prevalence of OA because pathologic changes start to take place long before the radiologic changes manifest.(4)

1.2 Statement of The problem

Although OA occurs all over the world, the pattern of disease varies among populations. Studies describing the clinical pattern of OA in Ethiopian patients are lacking.

Ethiopia is a developing country where most of the populations' livelihood is agriculture, which is different from that of developed countries. However there is difference in occupation between the urban and rural part of the country. In Urban areas more people engage in sales and services than rural areas where most people indulge in agriculture. (10) In recent years sedentary life style is increasing in the country where people are employed in sales and services is increasing. In recent years mortality in the country is declining and as the result life expectancy is increasing in the country. (10) With the above mentioned reasons one can assume that the rate of osteoarthritis prevalence can be high. The other problem in our society is that peoples tend to delay decisions regarding going to treatment until the symptoms of their condition worsen, and most of the time people will not give attention to subtle problems unless they are incapacitating and this may aggravate their medical condition. Because of these factors, we can anticipate that the clinical pattern of OA could be different and the severity and pattern of OA would be different and greater than that of the Western world.

This Field is not studied well because the Rheumatology service is not well developed in the country. So far there is limited data in Ethiopia on the pattern and prevalence of osteoarthritis and Data exploring the prevalence and risk factors of OA are of paramount importance in establishing healthcare policies.

1.3 Significance of the Study.

TASH is a tertiary hospital where people come from all over the country it will enable us to see the difference in pattern of OA in those patients living in the cities and the rural regions.

Information obtained from studies of the pattern of the disease in different continents could be important in planning for control and prevention and might contribute to a further understanding of the pathogenesis of the disease.

This study will serve as milestone for Minister of Health and other Governmental and non-governmental organization to particularly focus on intervention programs on Osteoarthritis focusing on the main risk groups.

These kinds of studies will also help as a source of reference for medical students, residents, seniors as a teaching purpose. It also serve as a comparison point and reference for anyone who likes to do a research on this area.

Therefore, this study was conducted to assess the pattern of Osteoarthritis based on the two common sites, Knee and hip and associated risk factors.

2.1 Literature Review

Osteoarthritis is one of the leading cause of morbidity in the world. It is the most common joint pathology in the world, accounting for 10-20% of population. The most commonly involved joints are the knee, hip, hands and spine. From these the commonest joint involved is the knee, followed by the hip in some studies or followed by spine in others. (11).

The risk factors of OA include Obesity, previous joint trauma and related to occupational load on the joint. From these obesity is a very important and modifiable risk factor. (12) Obesity is also major risk factor in the female population. The mean BMI of OA patients is in the overweight and obese group. Obese and overweight patients predominantly have hip and knee arthritis. And usually in these population bilateral OA is observed.(13)

It is expected that the risk factors of OA may not vary from population to population because the pathophysiology involves cartilage changes as a result of longstanding metabolic and mechanical processes.(14)

The pattern of involvement of joints affected by OA, however differ in different parts of the world owing to differences in genetics and occupational status. For example primary OA of hip is rare in black American studies and west African studies while it has higher prevalence in east African studies and western studies.(15)

The prevalence of OA in African studies showed variable results, some showing low prevalence while others show high prevalence. For example a research done by H.A Nour et al assessing patterns of knee, hip and hand OA in Kenyatta National Hospital show only 9.8% prevalence.(13) However there are few studies done on OA in Africa. From these studies most of them confirm to the western OA pattern. Knee OA being first followed by hip and hand OA. Knee OA was very common and the majority of the patients were overweight and obese. These findings were seen in both eastern and western African studies. And mostly the joint findings were mono-articular .(15)

The age range of OA varies between different populations. Most western studies show age range between 60-70 years. However lower age ranges are seen in African studies most patients being the mean age around 50 years and the range from 30 to 70 years . This might be attributable to the younger mean age of the population. (15) A common observation with regard to age is that there is increase in prevalence directly proportional to age. The reason given for this being the irreversibility and progressive pattern of the disease. This holds both for small joints and for large weight bearing joints and for both men and women.(14) Some studies

show that symptomatic OA occurs in later age, while radiological manifestations of the disease manifest at earlier age. Showing that we can see incidental radiological OA without any clinical presentation.(16)

The pattern of OA with regard to Sex also varies among different populations. Hip OA is most often seen in men, while small joints of the hands, tarsometatarsal, and lateral metatarsophalangeal joints of the feet and both knees were more often involved in women of all ages. Another study also showed females have higher knee OA prevalence. The mean age of OA in females is slightly lower than in men.(17)

The other risk factors trauma and occupation are also well proven in many researches. Trauma was implicated especially in knee OA of men.(12) Most female OA patients were engaged in domestic work and trading, while males were involved in unskilled labor and farming. (12) Less Hip OA was observed in patients who usually carry or lift objects in their day to day activities. (17)

As has been discussed above knee OA is the commonest OA pattern in terms of joint involvement. Knee OA prevalence varies from place to place and it ranges from 7-20%. Like the other types of OA it is more common in females. And the prevalence increases with age, observed in mid to older age group (from 40-70 years of age).(12) Knee OA has bilateral pattern in 45-85% of patients. And in about 60% it involves at least two compartments. (18)

From the three compartments of the knee joint the medial tibiofemoral joint compartment and patellofemoral compartment are more commonly affected. Medial tibiofemoral compartment is the most commonly affected. However in females lateral tibiofemoral compartment is more affected than in men.(19)

The definition of knee OA considers presence of osteophytes and joint space narrowing. However from the two the most sensitive one is presence of osteophytes. Also the presence of osteophytes goes with the severity of the patient's clinical symptoms. Presence of Patellofemoral joint osteophyte is more sensitive but less specific than presence of tibiofemoral joint osteophyte.(19)

From occupation groups highest knee OA prevalence was observed in farmers followed by traders. Other risk factors identified were heavy lifting, prolonged walking, kneeling for prayers, squatting and frequent bending and childhood rickets. Another risk factor for knee OA is obesity. Overweight and obese patients have propensity for bilateral knee joint involvement. From the risk factors obesity is a modifiable risk factor.(12) Trauma was a significant risk factor of Knee OA in Caucasian studies, but in African studies it was less significant.(20)

With regard to Hip Osteoarthritis it is said that primary hip OA was higher for men before 50 years and after 50 higher in females as found in one article with the following finding: mean prevalence of radiographic primary hip OA was higher for men in two of three age groups

before 50 years(ie, 40–44 years, 45–49 years) but in only three of eight age groups after age 50 years (ie, 55–59 years, 60–64 years,70–74 years). The higher incidence of hip OA in women after age 50 years may be related to hormonal changes from menopause(21). Though most western researches showed high prevalence of hip OA, in some there is disparity for example in research done in Korea: Their conclusion was that the prevalence of hip OA was much lower than that in the Western populations(22)

The problem that we might expect in doing such researches regarding pattern and risk factors of osteoarthritis are lack of well documented data, as found out in a research published in Netherlands. The conclusion of the research was that the only data that could be compared from a reasonable number of surveys were the radiological data. Data on body mass index, pain, limitation of movement, bone mass, etc are not available from most of the populations.(14)

Regarding the Radiographic assessment of Osteoarthritis most researches suggested that Kellgren and Lawrence grading system accepted by WHO 50 Years ago to be the most acceptable one. According to a article published in London it suggested many grading systems have been proposed in the last few years, but most epidemiologic studies used the Empire Rheumatism Council system which was developed by Kellgren/Lawrence.(23). This article ends by concluding its not appropriate to abandon the scoring system before a consensus on improved method is suggested which we don't have until now. This was also supported by another research by Jacobson, in its conclusion it stated that the grading system by Kellgren and Lawrence is still in use and that further development and validation of new scoring systems is needed before they will become internationally accepted.(8)

3. OBJECTIVES

3.1 GENERAL OBJECTIVE

- To describe the pattern of OA of Hip and Knee in TASH.

3.2 Specific Objectives

- To determine the pattern of OA based on site and compartment involvement
- To determine the pattern of radiologic manifestations of OA
- To determine the pattern of OA based on Age and Sex
- To determine the pattern of OA based on BMI

4. MATERIAL AND METHODS

4.1 STUDY AREA

The study was conducted at Radiology Department, Tikur Anbessa Specialized Hospital (TASH), Addis Ababa, Ethiopia. TASH is a large referral teaching hospital, under the administration of Addis Ababa University, located in Addis Ababa, Ethiopia. It has departments such as internal medicine, surgery, gynecology and obstetrics, pediatrics, radiotherapy, adult oncology, pediatric oncology /hematology, nuclear medicine, psychiatry, laboratory, orthopedics, rheumatology, pharmacy etc. The hospital has 700 beds and give diagnostic and treatment service for about 370,000-400,000 patients per year. The Radiology department is one of the many departments in the institution which gives radiologic medical service and academic activities

4.2 STUDY DESIGN AND DURATION OF STUDY.

Hospital based descriptive cross sectional study using a questionnaire. The study was conducted from September 2018 to May 2019

4.3 POPULATION

4.3.1 SOURCE POPULATION

All Osteoarthritis patients having follow up at Orthopedics clinic, TASH

4.3.2 STUDY POPULATION

The study populations were all patients who had follow up at orthopedics clinic with diagnosis of Osteoarthritis of Hip and knee.

Inclusion Criteria

All patients who had follow up at orthopedics clinic with diagnosis of Osteoarthritis of Hip and knee and who have appropriate radiographs done at department of radiology.

Exclusion Criteria: Any erosions or periarticular osteoporosis were disregarded.

4.4 SAMPLE SIZE DETERMINATION AND SAMPLING TECHNIQUE

4.4.1SAMPLE SIZE

The sample size is determined using EPinfo version 20 considering 95% confidence intervals, and 5% marginal error. From previous western research results the prevalence of OA in the general population is about 14%.(17) The following single proportion formula is used to estimate the sample size.

$$N= z^2p (1-p) / d^2$$

Where N- sample size

p- Proportion

Z- Level of confidence

d= margin of error

So total sample size becomes **185**.

Adding 10% non respondent rate: which is 18.5, The total sample size will be 204.

4.4.2 SAMPLING TECHNIQUE

Convenient sampling technique was used for sampling technique.

4.5 STUDY VARIABLES

4.5.1 DEPENDENT VARIABLES

Radiographic Pattern of Hip and Knee Osteoarthritis

4.5.2 INDEPENDENT VARIABLE

- Age
- Sex
- Occupation
- BMI
- Compartments affected

4.6. TERMS AND OPERATIONAL DEFINITIONS

Radiographic Definition of OA: Radiographs with definite Osteophytes with or without Joint space narrowing, sclerosis, subchondral cyst and bony deformity which is scored by Kellegren-Lawrence method.(Annex II)

Bone Sclerosis: abnormal increase in density detected by radiograph.

BMI: BMI was calculated as weight in kilograms divided by height in meters squared, and BMI categories were defined as: underweight/normal (BMI <25); overweight (25 ≤BMI <30); obese (30 ≤BMI) (1)

Radiography: is an imaging technique using X-rays to view the internal form of an object.

Standard Views: For knee Radiograph: Appropriate AP and Lateral radiograph of the knee

For Hip Radiograph: Appropriate AP radiograph of Hip/Pelvis, Frog leg lateral view.

4.7 DATA PROCESSING AND ANALYSIS

Data was checked for completeness on a weekly basis. To be edited and cleaned, the collected data was be entered using Epi-Data version 3.1 and exported into SPSS version-25 for analysis. Incomplete and inconsistent data were excluded from the analysis.

The data was processed by using descriptive analysis, including frequency distribution and summary measures. Test of association between the outcome variable and some of the patients socio-demographic features were investigated with bi-variant logistic regression analysis method. To see the presence of independent predictor variables in relation to dependent were measured using multivariate logistic regression method (adjusted odds ratios (OR) and 95% confidence interval (CI)). P values less than 0.05 were considered statistically significant.

4.8 ETHICAL CONSIDERATION

Data collection was started after getting permission from the ethical review committee of the Department of Radiology, TASH.

5. Result

1. Socio-Demographic Characteristic

204 patients with knee and Hip OA were included in the study. Out of the 204 patients assessed 138(68%) were female and 66(32%) were male. The mean age was 54.6yr and the age range was between 21-83yrs. The mean age of the Female patients was 53.3y and Male patients was 57.3yr. According to site of OA the mean age was 54.8yr for knee OA and 53.3yr for hip OA.

Table 1: Frequency distribution of sociodemographic variables of patients with diagnosis of Hip and Knee OA in TikurAnbessa Hospital, Addis Abeba, Ethiopia , From September 2018-May 2019

Site	Female	Male
Knee	107	43
Hip	23	19
Both Hip and Knee	8	4

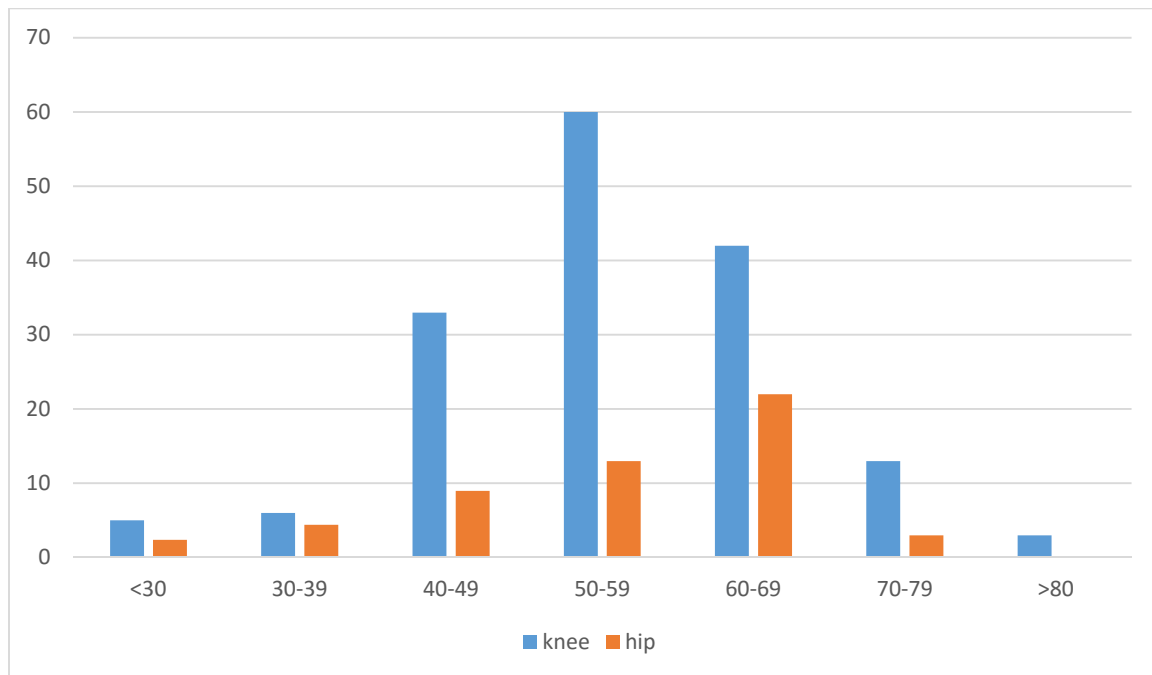


Figure 1: Age category distribution of patients with diagnosis of Hip and Knee OA in TikurAnbessa Hospital, Addis Ababa, Ethiopia, From September 2018-May 2019

Table 2: Frequency distribution according to occupational categories in patients presenting with knee and Hip OA in TikurAnbessa Hospital, Addis Abeba, Ethiopia from September,2018-May 2019

		occupation categories		
Count				
		Sex		Total
		M	F	
occupation categories	Domestic work	3	46	49
	Trading	11	13	24
	Farming	10	1	11
	skilled labor	23	43	66
	unskilled labor	17	30	47
	Teaching	2	5	7
Total		66	138	204

2. Distribution interms of Site of involvement and Radiologic manifestation

Out of the 204 patients assessed 150 had Isolated Knee OA, 42 had isolated HIP OA and 12 had both hip and Knee OA.

From 162 patients with Knee OA: All of them had Osteophytes, 147 had Joint space narrowing, 66 had sclerosis, 14 had subchondral cysts and 13 had loose bodies.

From 54 patients with Hip OA: All of them had osteophytes, 43 had Joint space narrowing, 40 had sclerosis ,12 had subchondral cyst and 9 had loose bodies.

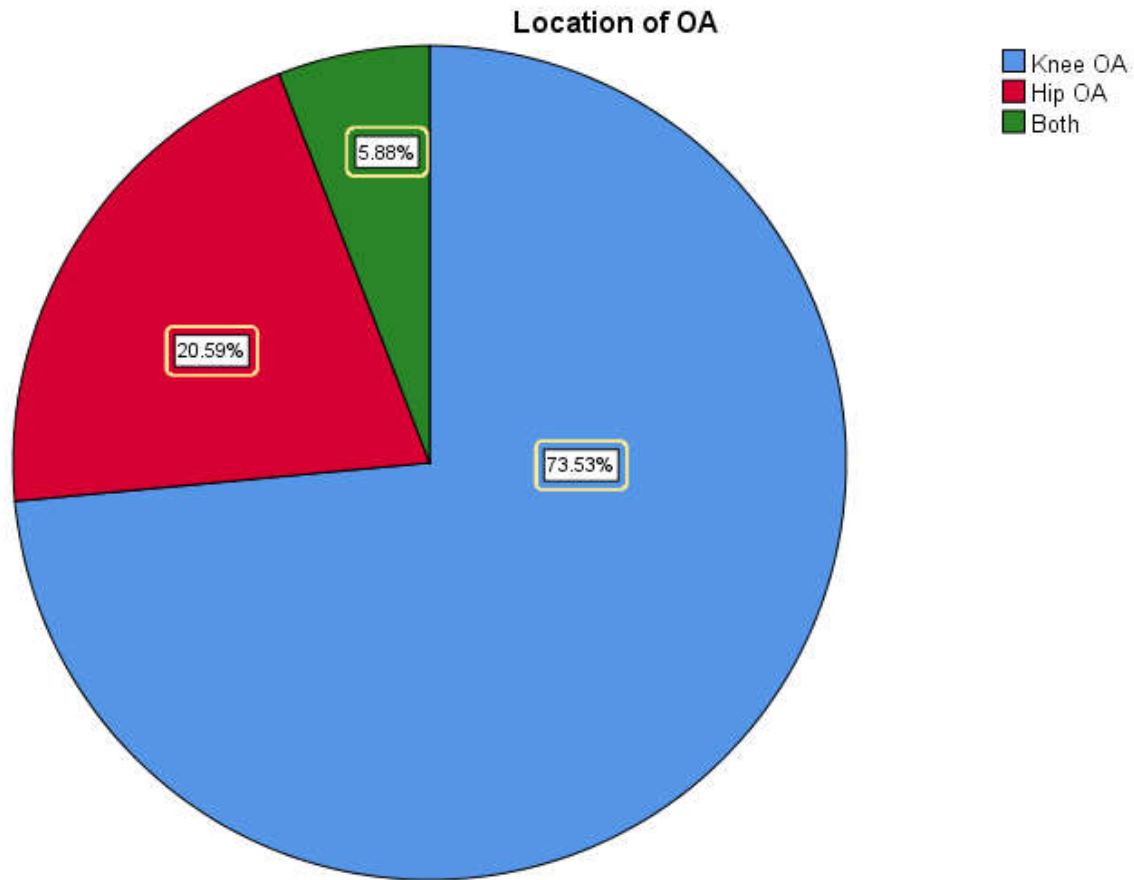


Figure 2: Chart showing distribution according to location of OA of patients with diagnosis of Hip and Knee OA in TikurAnbessa Hospital, Addis Abeba, Ethiopia , From September 2018-May 2019

3. Pattern according to Compartment involvement in those with evidence of JSN

From 162 total patients with knee OA , 147 had evidence of Joint space narrowing. From the 147 : All of them(100%) had MTF compartment involvement, 34(23%) had LTF involvement and 67(45.5%) had evidence of PTF involvement. LTF compartment involvement was associated with male than female sex with P value of 0.043.

43 of patients with Hip OA had radiologic evidence of Joint space narrowing. All had superolateral JSN while 19 of them that is 44% had either Superomedial(Axial) or medial JSN.

Table 3: Frequency Distribution according to Compartment involvement of Knee OA in patients presenting with knee and Hip OA in TikurAnbessa Hospital, Addis Ababa, Ethiopia from September, 2018-May 2019

Compartment	Male	Female	Significance
MTF	44	103	
LTF	15	19	P-0.043
PTF	21	46	p-0.732

4. Distribution according to location

According to location of knee OA: 112 patients had proper bilateral knee Radiograph, Among these : 90(80.3%) had bilateral involvement and 22(19.7%) had unilateral involvement. With regard to Hip OA : 37 patients had proper bilateral Hip radiograph: 27(73%) patients had bilateral and 10(27%) had unilateral hip joint involvement.

5. Chief complaint versus site of OA

Patient came with chief complaint of either pain, swelling, limping or deformity. The following table summarizes the complaints according to the site of the OA.

Table 4: Frequency and Percentage of Chief complaint versus site of OA in patients presenting with knee and Hip OA in TikurAnbessa Hospital, Addis Abeba, Ethiopia from September,2018-May 2019

Complaint	Knee OA	Hip OA
Pain	162(100%)	46(85%)
Swelling	32(19.7%)	2(3%)
Limping(limitation of movement)	5(3%)	25(46%)
Deformity	3(1.8%)	6(11%)

6. Associations

The most common association was obesity. Patients with BMI >25 were considered overweight and BMI>30 as obese. Among patients with knee OA: 1(0.6%) was underweight, 34(21%) were in normal range, 70(43.2%) were overweight, and 57(35.2%) were obese. Among patients with Hip OA:1(1.9%) was underweight, 18(33.3%) normal range, 28(51.9%) were overweight and

7(13%) were obese. The mean BMI of the study population was 28. Mean BMI of knee OA was 28.4 while Hip OA was 26.57.

Participants of Knee OA had higher BMI than participants with Hip OA and Overweight and Obesity was associated more in Knee OA(78.4%) than Hip OA(64.9%) with P value of 0.046

Table 5: Distribution of BMI according to Knee and Hip OA in patients presenting with knee and Hip OA in TikurAnbessa Hospital, Addis Abeba, Ethiopia from September,2018-May 2019

	Knee OA	HIP OA
Underweight(BMI<18.5)	1(0.6%)	1(1.9%)
Normal: BMI(18.5-24.9)	34(21%)	18(33.3%)
Overweight(BMI 25-29.9)	70(43.2%)	28(51.9%)
Obese(BMI>30)	57(35.2%)	7(13%)

7. Discussion

The studies on prevalence and pattern of OA in Ethiopia are limited. This study set out to determine the pattern of Hip and Knee OA in a Hospital based study carried out at TASH, CHS.

This study reviewed 204 patients with hip and knee OA. The study showed OA occurred more in Female population(68%) and in the middle age and elderly population. This is in accordance with similar study done in Nigeria(Ebongetal)(66.7%)(12)and by Joana et al UK.

The mean age of the participants was 54.6yrs which is comparable with study done in Nigeria(54)(12).

This study found that Knee OA(74%) was much more common than Hip OA(21%) which is comparable to study done in Nairobi(H.A. Nour, G.O. Oyooetal)(77% Knee OA, 15% Hip OA)(13) and in Nigeria(A o Adebajo)(15).

Bilateral involvement was more common in knee than Hip OA.80.3 % of knee OA participants had evidence of bilateral involvement which was also similar to study done by Joana et al which found that involvement of bilateral knee is more common than unilateral involvement. (20).The study found 85% bilateral involvement which is comparable to our finding. In a study done in Cardiff university by Metcalfe et al. also found that bilateral involvement was common and that the incidence of being bilateral increases with the duration of the illness.

Regarding Knee Joint compartment involvement different articles published variable results whether MTF compartment or PTF compartment was more common.(19,20) The study found that MTF compartment was most commonly involved followed by PTF and LTF was the least compartment affected. Lateral compartment was least commonly affected in study done in UK by Joanaetal(20). Isolated LTF compartment involvement was associated with male than female sex with P value of 0.043. This can be explained by Compartmental involvement of knee joint appearing at late stage and the male population comes later to clinical attention. This was opposite to the results obtained by Barton L etal(19)

In our study Osteophytes were seen in all joints affected by OA. It was followed by Joint space narrowing, sclerosis , subchondral cyst and loose bodies respectively in both hip and knee OA. This was comparable to study done in UK(20)

Most participants in our study were skilled laborers and professionals because the study was conducted in the Urban setup Compared to Nigerian study where most were either traders or domestic work.(12)

The role of obesity as a cause of OA is still unresolved. Some found correlation while others didn't find significant association. (12, 13)Regarding obesity and OA the study shows obesity and overweight were prevalent in patients with OA. In our study 78.4% of knee OA patients and 64.9% of Hip OA patients were either overweight or obese. This findings is similar to study done in Nigeria(A. Adebajoetal). The Mean BMI of knee OA was 28.4kg while Hip OA was 26.57kg. This is similar to study done in Kenya by H.A. Nour et al (13)

The study also showed that being overweight and obese was more associated with Knee OA than Hip OA. This also was comparable to studies done in Kenya(13) . Studies show that there is significant link between obesity and development of OA.(Coggon et al)Though our study didn't study association between obesity and development of knee or Hip OA , The above result can show that obesity might have a role in development of OA especially of knee OA.

8. Conclusion

Knee and Hip OA was more common in female, middle aged and elderly population which was comparable with studies done in other African countries.

Knee OA was more common than Hip OA. Most knee OA were bilateral compared to Hip OA. The commonest radiologic manifestations of OA observed in the study was osteophyte followed by JSN, sclerosis, subchondral cysts and intraarticular loose bodies respectively.

Regarding knee joint compartment involvement MTF was the most common compartment affected followed by PTF and LTF. Regarding Hip Joint compartment involvement Superolateral compartment was the most common compartment affected followed by axial and medial compartments.

The mean BMI of the study population was 28kg. Knee OA was more associated with being overweight and obese than Hip OA.

9. Limitations of the Study

1. The research is a hospital based study which doesn't reflect the true pattern of OA in the general population
2. There was no control group to study associations especially obesity with development of knee and Hip OA
3. Relatively small number of study sample size
4. The study was done in specific joints which doesn't necessarily predict the true pattern of OA

10. Recommendation

We recommend population based study done on large sample size regarding prevalence and pattern of OA in Ethiopia.

We recommend studies to evaluate the impact of obesity in the development of OA.

We also recommend prevention programs aimed at reducing obesity both at national and individual level.

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11. Annexes

ANNEX - I

QUESTIONNAIRE

PART 1: Radiographic findings to be filled by the Data Collector

If Knee Radiograph

1. Age of the patient:

2. Sex of The patient : A. Male B. Female

3. Clinical Data

5. Which Knee joint is involved?

A. Right B. Left

6. Additional radiographic Findings

A. Sclerosis B. Joint space narrowing C. Subchondral Cysts D. Loose Bodies

7. Compartment involved

A. Medial Tibiofemoral

B. Lateral Tibiofemoral

C. Patellofemoral

D. More than one: Please specify

For Hip Radiograph

1. Age of the Patient

2. Sex of the patient : A. Male B. Female

3. Clinical Data:

4. View Taken

A. AP HIP B. AP pelvis

Specify if different:

5. Which Hip joint is involved?

A. Right B. Left

6. Additional radiographic Findings

A. Sclerosis B. Joint space narrowing C. Subchondral Cysts D. Loose Bodies

7. If any joint space narrowing?

A. Superolateral B. Medial C. Superomedial/axial

PART 2:Filled By the Principal investigator

A. Weight of the patient

B. Height of the patient

C. Occupation

D. Main Complaint

ANNEX II

FIG 1:

Kellgren-Lawrence(KL)grading system of OA

- **KL-Grade 0-indicates that no radiographs features of OA.**
- **KL-Grade 1-is doubt full JNS and osteophytes lipping.**
- **KL-Grade 2- the presence of definite radiograph osteophytes and possible JSN**
- **KL-Grade 3- multiple osteophytes, definite JSN ,sclerosis ,possible bony deformity**
- **KL-Grade 4- large osteophytes,markedJSN, severe sclerosis and definite bone deformity.**

