OSTEOARTHRITIS;
PATTERN OF SYMPTOMATIC AND RADIOGRAPHIC IN THE URBAN POPULATION OF KARACHI

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ABSTRACT… Objectives: To determine the pattern of symptomatic and radiographic osteoarthritis in the urban population of Karachi. **Data Source:** Outpatient clinics. **Design of Study:** Cross sectional observational. **Setting:** Liaquat National Hospital, Karachi. **Period:** August 2015 till July 2016. **Materials and Methods:** Symptomatic patients belonging to both genders, aged ≥ 30 years, having clinical and radiographic osteoarthritis involving knee, hip, spine, hand, foot and shoulder were included. Diagnosis of knee osteoarthritis was based on American College of Rheumatology criteria, whereas the diagnosis of other joint areas was based on clinical and radiographic features. Patients were categorized as having monofocal or multifocal osteoarthritis. The results were interpreted as frequencies and percentages. **Results:** Of the total 215 patients, 137 (63.7%) were females and 78 (36.27%) were males with mean age of 52.2 ± 9.3 years. Monofocal and multifocal osteoarthritis was found in 151 (70.23%) and 64 (31.2%) patients respectively. Knee osteoarthritis (92.7%) was the most frequent monofocal presentation. Of 64 patients with multifocal osteoarthritis, knee and hip joint were involved in 28 (43.75%) and knee and hand osteoarthritis was found in 13 (20.3%) patients. Seven patients (10.9%) had osteoarthritis of three or more joints. Overall bilateral knee osteoarthritis was found in 158 (77.45%) patients. **Conclusion:** Bilateral symptomatic and radiographic knee osteoarthritis was the most common presentation. Comparatively less proportion of patients had osteoarthritis of three or more joints.

Key words: Osteoarthritis, Symptomatic, Radiographic, Pattern, Monofocal and Multifocal.

INTRODUCTION

Osteoarthritis (OA) is the most common age related degenerative joint disease that causes substantial burden in terms of physical disability and in turn carries adverse psychological and socioeconomic impact. WHO estimates that globally 9.61% of males and 18.0% of females aged over 60 years have symptomatic osteoarthritis, 80% of those with osteoarthritis will have limitations in movement and 25% cannot perform their major daily activities of life.[1] Cross et al reports that worldwide, among 219 diseases, hip and knee osteoarthritis is the 11th highest contributor to global disability and 38th highest in disability-adjusted life years (DALYS).[2]

Osteoarthritis is characterized by simultaneous degradation and aberrant repair process involving articular cartilage, subchondral bone and synovium leading to progressive loss of articular cartilage, remodeling of subarticular bone, osteophyte formation and synovial inflammation. Osteoarthritis most commonly affects knee, hip, spine, hand and foot. The incidence of osteoarthritis increases with age and is considerably higher in females than males.[3,4] Epidemiology of osteoarthritis has been shown to be related with geographic and ethnic factors in Framingham study and other studies.[5-7] Fransen et al reports two to three times higher prevalence of bilateral knee osteoarthritis in Chinese population compared to estimates from the Framingham study.[7] The Community – Oriental program for the control of rheumatic diseases (COPCORD) studies conducted in Pakistan, India and Bangladesh reported the prevalence of knee OA among rural and urban communities.[8–10] The prevalence of knee Osteoarthritis was 3.1 – 4.6% in Urban

and 3.6% in Rural North Pakistan and 10.20% in Bangladesh. Data from Indian population showed 6.0% and 13.7% prevalence of knee pain in urban and rural communities respectively.[9] Pattern of joint involvement in osteoarthritis is reported to be associated with geographic, ethnic and racial factors. Hip osteoarthritis is shown to be rare in Asian countries.[11–13] Significantly lower frequency (80% – 90% less) of hip osteoarthritis has been reported in Chinese population as compared to Caucasians.[12] Minh et al reported higher prevalence of hip osteoarthritis in urban Vietnam.[14] Local data demonstrating the pattern of joint involvement in osteoarthritis is sparse. Two surveys by Gibson et al and Farooqi et al[8] approximately two decades ago, reported the knee to be the most commonly involved joint in affluent urban community living in Karachi and North Pakistan. Data on multifocal pattern of osteoarthritis is lacking. The present study is designed to determine the pattern of osteoarthritis in a cohort of patients visiting outpatient clinics at a tertiary care hospital in Karachi.

Evaluation of the clinical pattern of osteoarthritis would help to estimate the disability and socioeconomic burden. It would further help to plan prevention strategies and provision of appropriate healthcare facilities.

PATIENT AND METHODS
This cross-sectional observational study was conducted from August 2015 till July 2016 at Liaquat National Hospital, Karachi, Pakistan. Liaquat National Hospital is one of the major tertiary care hospitals in the private sector. We included all the patients of both genders, age ≥ 30 years attending outpatient clinics, with both clinical and radiographic evidence of osteoarthritis involving knee, hip, spine, hand, shoulder and foot.

Knee osteoarthritis was diagnosed on the American College of Rheumatology (ACR) criteria[16] i.e. knee pain for most days of the prior month; and / or morning stiffness longer than 30 minutes and / or crepitus on active motion and / or age > 50 years and osteophytes on knee radiographs. The diagnosis of hip, hand, foot, shoulder and spinal osteoarthritis was based on the following clinical and radiographic manifestations i.e. history of mechanical pain, pain on active or passive movement and / or reduced range of movement, Bouchard and Heberden nodes and radiographic finding of joint space narrowing, osteophyte formation and bone sclerosis. Patients with any evidence of secondary osteoarthritis (inflammatory / erosive arthritis, history of trauma or fracture of the involved joint, anatomical deformities from developmental disorders) were excluded.

Informed consent was obtained from all the patients. They were categorized as having monofocal or multifocal osteoarthritis on the basis of the presence of both clinical and radiographic evidence of osteoarthritis in one or two and more joint areas (knee, hip, shoulder, spine, hand and foot). Demographic, clinical and radiographic characteristics of the study population were obtained by experienced rheumatologists.

Data was analyzed using SPSS 20.0. Mean and Standard deviation (SD) were calculated for continuous variables and frequencies were done to determine the relationship between different variables.

RESULTS
A total of 215 patients were enrolled after dropping 13 patients who gave the history of trauma to the presenting joint. Overall female to male ratio was 1.75:1 with 137 (63.7%) females and 78 (36.27%) males. Mean age was 52.2 with SD ± 9.3. 67 patients (31.2%) belonged to the age group 41-50 years, 84 (39.1%) belonged to the age group 51-60 years, 52 (24.2%) were from 61-70 years age group and 12 (5.6%) were >70 years.

Table-I shows the clinical features of enrolled patients. Data reveals predominantly monofocal OA 151 (70.23%), with knee 140 (92.7%) being the most frequently involved joint. Figure-1 shows monofocal pattern of osteoarthritis in the study population. We did not find monoarticular OA of shoulder and foot. Figure-2 shows the multifocal pattern of OA in study population. Of 64 (31%) patients with both symptomatic and radiographic features of multifocal OA, knee and hip OA was

the most frequently observed pattern (43.75%) followed by knee and hand osteoarthritis (20.3%).Overall knee joint was affected in 204 (94.88%) followed by hip joint (n=36, 16.74%). Predominantly bilateral OA was observed in knees (n=158, 77.45%) and hands (n=22,100%).

Clinical Features	n (%)
Male	78 (36.27%)
Female	137 (63.7%)
Disease type	
(i) Monofocal osteoarthritis	(i) 151(70.23%)
(ii) Multifocal osteoarthritis	(ii) 64 (31.2%)
Affected Side	

(i)   Knee
   (a)   Unilateral
   (b)   Bilateral
	(i) 204 (94.88%)
	   (a) 46 (22.5%)
	   (b) 158 (77.45%)

(i)   Hip
   (a)   Unilateral
   (b)   Bilateral
	(i) 36 (16.74%)
	   (a) 31 (86.1%)
	   (b) 5 (13.88%)

(i)   Shoulder
   (a)   Unilateral
   (b)   Bilateral
	(i) 8 (3.7%)
	   (a) 2 (25%)
	   (b) 6 (75%)

(i)   Hand
   (a)   Unilateral
   (b)   Bilateral
	(i) 22 (10.23%)
	   (a) 0 (0%)
	   (b) 22 (100%)

Spine	18 (8.33%)
Cervical	7 (38.8%)
Lumber	18 (100%)

Table 1: Clinical Characteristics of Patients: n(%)

Monofocal

Figure-1

Multifocal
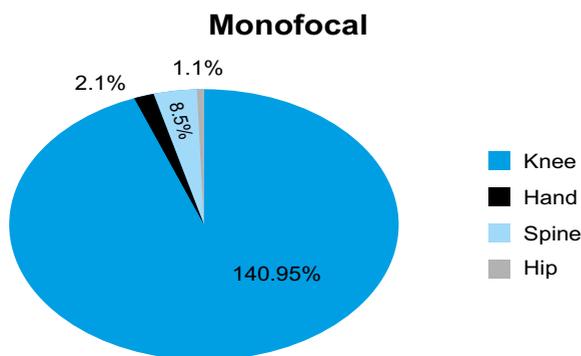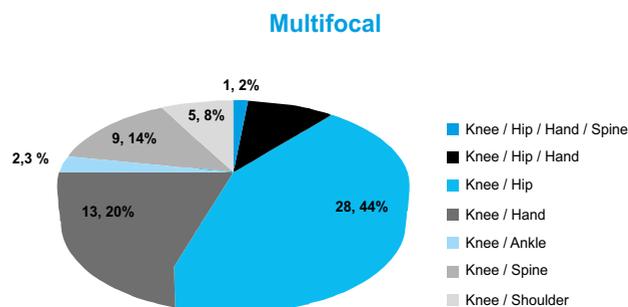
Figure-2

DISCUSSION

Present study shows the pattern of both symptomatic and radiographic OA in patients from urban population visiting the outpatient clinics. Although symptomatic and radiographic OA has shown to be poorly correlated, but as the present study was hospital based, all enrolled patients were symptomatic and we had the facility to get radiographic evidence of OA of affected joints. Observed geographic variation in prevalence and pattern of OA can be attributed to genetic factors, average age of the population, cultural activities and socioeconomic environment. Age is the most consistent non modifiable factor associated with OA. The most frequent age group in our study population belonged to 51–60 years (39.1%) followed by 41 – 50 years. Another local study[17] from Karachi showed similar results (28%) in 55 – 59 years age group presenting with knee osteoarthritis. 13% of patients in our study belonged to age group 30 – 40 years, and almost all presented with knee osteoarthritis. Macdonald et al[18] reported that 16% (CI 12.6 – 20.0) of Canadians aged 20 - 40 years reported osteoarthritis of any joint compared to 44.6% (CI 40.9 – 48.3) aged 65 years or older. In our hospital based study, there was comparatively less percentage of patients (22% and 5.5%) in the age group from 61 – 70 years and above 70 years age group with reported osteoarthritis of any joint. This may be attributed to the inability of older age groups to visit tertiary care hospitals because of disability and socioeconomic factors. Gender is another important risk factor of OA. As reported by others.[17-19] Our study also shows high proportion of females presenting with OA of any joint.

Higher prevalence of knee OA has been reported in Asians as compared to Caucasians.[5,7] Our study also reports knee being the most affected joint in terms of monofocal and multifocal presentation (Figure-1&2). Greater proportion of outpatients with knee OA had bilateral involvement. Bilateral knee OA has reported to be an independent risk factor for decreased physical activity.[19] Gunter el all reported that approximately 80% of patients requiring total knee replacement had radiographic OA in the contralateral knee.[20] A population based study by Andrew et al showed that 80% (24 out of 30) patients with unilateral disease at baseline developed bilateral disease after 12 years.[21] Hip and hand OA is reported to be uncommon in Asia Pacific region.[12,22] Our study also reports significantly less proportion of patients with monoarticular presentation with symptomatic hand (n, 2, 1.32%) and hip (n, 1, 6.66%) OA. Our findings are consistent with another hospital based local study from Karachi.[15] Symptomatic monoarticular presentation of shoulder and foot OA was not reported in our study.

The global age standard prevalence of knee and hip osteoarthritis is shown to be 3.8% and 0.85% respectively.[2] Cross at el showed that years of life lived with disability for hip and knee osteoarthritis increased from 10.5 million in 1990 to 17.1 million in 2010.[2] Of the 64 patients (29.7%) with multifocal pattern, knee and hip osteoarthritis 43.7% (n = 28) is the most frequently observed pattern in our study which was not previously found in the two local studies.[8,15] Evidence of knee and hand OA was observed in 20% (n=13) of patients, whereas knee and spine OA was observed in 14 %(n=9) patients. The prevalence of radiological OA has been reported to be strongly associated with age.[23] In the present study a lower proportion of spinal OA could be attributed to a comparatively lower percentage of patients from age group 60 years and above. Among 64 patients with multifocal OA, 7 (10.9%) patients had symptomatic radiographic evidence of osteoarthritis involving three or more joints. However, local data describing multifocal OA pattern in our population is lacking.

With regards to limitations of the study, we only obtained the radiographs of symptomatic joints and therefore the frequency of multifocal OA may have been underestimated.

CONCLUSION
Bilateral symptomatic and radiographic knee osteoarthritis was the most common presentation observed in our patients. Symptomatic and radiographic involvement of three or more joints was less frequently observed. A considerable proportion of patients had both knee and hip osteoarthritis which has not been previously documented in other local studies.

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AUTHORSHIP AND CONTRIBUTION DECLARATION
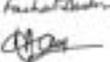
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2	Aneela Altaf Kidwai	Data Analysis, Review of literature	
3	Farhat Bashir	Data interpretation	
4	Mahfooz Alam	Final Write up	