

Pattern of Symptomatic Idiopathic Osteoarthritis In Elderly: A Hospital Based Study.

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Objectives: to assess pattern of symptomatic idiopathic OA in the elderly and the possible risk factors in that group of patients. **Subjects and methods:** A cross sectional study was conducted among 100 patients aged ≥ 60 years from Ain Shams University hospital, each patient was subjected to comprehensive geriatric assessment. Hip, hand, and knee OA were diagnosed by American College of Rheumatology criteria, and 1st metatarso-phalangeal, talonavicular, wrist joints, lumbar apophyseal joints and cervical apophyseal joints were diagnosed by presence of any of clinical manifestations plus Kellgren and Lawrence grading (\geq grade 2). Risk factors were reported by history, examination and occupational exposure questionnaire. **Results:** Knee, hip and hand OA were present in 80%, 23% and 30% consecutively. 38% were obese and 12% were smoker. Seventy one percent were at risk of carrying heavy objects. Females have significantly more knee, hand, wrist, cervical and foot OA than males. Females were more obese and less smoker ($P= 0.002$ and <0.001 consecutively). **Conclusion:** Females have overall and individualized sites (including: knee, hand, wrist, cervical and foot) OA more than males, and higher risk factors than males (including BMI and repeating the same movement in many sites).

Key words: Osteoarthritis, elderly, distribution, gender, risk factors

Introduction

Osteoarthritis (OA) is the most common form of arthritis ⁽¹⁾ ⁽²⁾. Almost every age group is affected by OA, but prevalence increases dramatically after age 50 years in men and 40 years in women ⁽³⁾.

OA is a debilitating condition characterized by pain, joint inflammation and joint stiffness, and results in a substantial degree of physical disability ⁽⁴⁾. OA was ranked equally with heart disease, congestive heart failure and chronic obstructive pulmonary disease as a cause of physical disability ⁽⁴⁾.

Symptomatic OA should be a focus of studies because it causes disability and has formidable societal and public health impact;

few studies have been conducted to study symptomatic OA among the elderly ⁽⁵⁾.

OA is multifactorial in aetiology. The specific aetiological factors are unknown ⁽⁶⁾. Over the last two decades many epidemiological studies have investigated the determinants of OA. These studies are important to improve understanding the mechanisms leading to OA and to determine whether (modifiable) risk factors exist for which preventive interventions can be developed and investigated ⁽⁷⁾.

There is controversy about risk factors of primary OA; Shephard reported that the risk factors of primary OA: age; the prevalence greatly increases with age, gender; women suffer more often than men ; obesity; association is present with knee, hand, and

hip, mechanical factors; in form of occupational OA, and sports related OA, and genetic factors ⁽⁸⁾.

Although OA occurs worldwide, both its pattern and prevalence vary among populations ⁽⁹⁾.

Aim of the work was to report pattern of symptomatic idiopathic OA in the elderly and the possible risk factor in that group of patients.

Methods

A cross sectional design was used in this study. The study was conducted among 100 patients from Ain Shams University hospital. The study subjects were elderly patients with symptomatic primary OA. Each subject was subjected to comprehensive geriatric assessment with special consideration to *reporting of risk factors (age, gender, BMI and smoking) and reporting of occupational risk factor that was based upon reporting the occupation that they held the longest during their lifetime whether or not they were occupationally active at the time of the survey, as the definition used in the National Survey on Health Impairment and Disability of 1998 in France* ⁽¹⁰⁾.

Occupational exposure to biomechanical stresses was reported to the treating physician by yes or no, on items involved in a structured questionnaire: "During your entire professional life, did you (the patient) have to regularly 1) lift or carry heavy objects, 2) keep your affected joint in uncomfortable positions, as squatting or 3) repeat the same movements continuously ⁽¹¹⁾.

Diagnosis of symptomatic idiopathic OA for knee, hip and hand joints was according to American college of Rheumatology criteria

for classification and diagnosis of knee, hip and hand idiopathic OA ⁽¹²⁾⁽¹³⁾⁽¹⁴⁾.

While diagnosis of symptomatic OA of other joints corresponds to definition of symptomatic OA used by *Oliveria et al.* ⁽¹⁵⁾ which based on both :

Symptoms applied in the Framingham OA study ⁽¹⁶⁾, these symptoms derived from Health and Nutrition Examination Survey ⁽¹⁷⁾. (pain, stiffness, aching, swelling and/or tenderness).

Plus radiographic based definition of definite OA (\geq grade 2) by traditional Kellgren and Lawrence (KL) grading ⁽¹⁸⁾.

Kellgren and Lawrence studied hip, knee, hand, foot, wrist, cervical, and lumbar spine. However in the last two they involved only apophyseal joints, while patella femoral joint was not involved ⁽¹⁸⁾.

Table (1): affected Joint distribution in the study group.

Joint involved	
Knee	80 (80%)
Hip	23(23%)
Hand	30 (30%)
Cervical	49 (49%)
Lumbar	84 (84%)
Wrist	22 (22%)
Foot	23 (23%)

Exclusion criteria:

Patients with secondary OA were excluded. In addition, we excluded patients with cognitive impairment, because the possibility of unreliable history, and Patients who refused to be included in our study.

The study protocol was approved by Geriatrics and Gerontology department scientific committee and informed consent was taken from each patient.

Statistical analysis:

Data were collected, revised, coded, tabulated and introduced into a personal computer for statistical analysis. Qualitative data were presented in the form of frequency tables (number and percent). Quantitative data were presented in the form of mean+/-SD.

Regarding qualitative data, the chi-square test or Fisher's Exact test was used to compare between the two groups.

Results

Current study included 100 patients aged \geq 60 years, 50 males and 50 females. Knee, hip and hand OA were present in 80%, 23% and 30% consecutively (table 1). 38% were obese and 12% were smoker. 71% were at risk of carrying heavy objects (table 2).

Table (2): Risk factors in the study group:

Risk factors		
Gender	male	50 (50%)
	female	50 (50%)
Age group	60- 69 years	62 (62%)
	\geq 70 years	38 38%)
BMI group	normal 18-25	48 (48%)

Females have significantly more knee, hand, wrist, cervical and foot OA than males (P= 0.003, 0.029, <0.001, 0.003 and <0.001 consecutively). Females were more obese and less smoker (P= 0.002 and <0.001 consecutively) (table 3).

In males, exposure to carrying of heavy objects is significantly associated with knee OA, hand and lumbar OA (P= <0.001, 0.021 and 0.014 consecutively). However, in females, exposure to carrying of heavy objects is significantly associated with knee and lumbar OA (P= 0.002 and <0.001 consecutively).

There is significant association between higher experience of uncomfortable positions in males and knee, hip, hand, lumbar and cervical OA (P= <0.001, 0.009, <0.001, 0.033 and <0.001 consecutively). In females, there is significant association between higher experience of uncomfortable positions and knee, hand, wrist, cervical and lumbar OA (P= 0.029, 0.001, 0.001, <0.001 and <0.001 consecutively).

There is significant association between higher experience of repeated movements in males and knee, hand, lumbar and cervical OA (P= 0.001, 0.006, 0.025 and 0.001 consecutively).

Smoking	Overweight 26-29	14 (14%)
	Obese 30- 39	38 (38%)
	Non-smoker	70 (70%)
	Ex-smoker	28 (28%)
	Current smoker	12 (12%)
Mechanical loading risk factors		
▪ Lift or carry heavy objects?	71 (71%)	
▪ Keep your affected joint in uncomfortable positions?		
-Lower limb	70 (70%)	
-Hand and wrist	15 (15%)	
-Cervical	28 (28%)	
-Lumbar	55 (55%)	
▪ Repeat the same movements continuously?		
-Lower limb	54 (54%)	
-Hand and wrist	11 (11%)	
-Cervical	24 (24%)	
-Lumbar	55 (55%)	

BMI: body mass index

In females, there is significant association between higher experience of repeated movements and knee, hand, wrist, cervical, and lumbar OA (P <0.001 for all).

Discussion

OA is the most common joint disease in human, especially in the aging populations, and is expected to be the fourth leading cause of disability by the year 2020 ^{(19) (20)}.

The heterogeneity of OA is gaining wider acceptance, and identification of distinct

subgroups might provide further information ⁽⁹⁾.

This study aimed at estimating the pattern of distribution of primary OA in elderly Egyptian, in a hospital based study, with determination of presence of risk factors. 50 elderly men, and 50 elderly women were studied.

By studying pattern of OA distribution, knee OA was the most common followed by hip ,

hand , cervical , lumbar , wrist and foot OA

Our data about knee OA do not agree with *O'Reilly et al* who reported that the prevalence of symptomatic radiographic knee OA in older adults in Nottingham, England was 19% as overall prevalence in both men and women ⁽²¹⁾.

A study in West African teaching hospital, not in accordance with our data, patients' mean age was 53.7 and were diagnosed both by symptoms and radiology, revealed that 1% of patients have wrist OA ⁽⁹⁾.

Although Adebajo's study was a hospital based study, as the current study, the results may be affected by that male to female ratio was 3.5 : 1, resulting in less distribution of joints, as wrist joint, mainly affected in females.

Studying the prevalence of hand OA among white elderly ≥ 60 years in Framingham, 38.3% have symptomatic OA (diagnosed by symptoms and radiology) ⁽²²⁾, which is in accordance with current data.

Studies' results in Europe were in accordance with our data regarding hip OA, have estimated that approximately 7–25% of Caucasian individuals over the age of 55 years suffer from hip OA; these estimates vary due to differences in the definition of OA or the selection of the study population ^(23;24;25;26).

The prevalence of facet joint pain, diagnosed by positive response to double local anesthetics, was 28%, and 66% in lumbar joints in elderly aged 61 – 70 years and greater than 70 years of age respectively; while in cervical joints, it was 35%, and 33% in elderly for the same age groups respectively, Mode of onset of pain was gradual onset (without incident) ⁽²⁷⁾.

The higher distribution of knee, cervical and lumbar OA in our sample could be attributed to that our sample is hospital based and the pattern was described among cases in this cross sectional study.

On gender basis; females had significantly higher knee, hand, wrist, foot and cervical OA than males.

Table (3): Reporting of joint distribution and risk factors in both genders:

		Male	Female	P value
Joint involved				
Knee		34 (68%)	46 (92%)	0.003
Hip		9 (18%)	14 (28%)	0.235
Hand		10 (20%)	20 (40%)	0.029
Cervical		17 (34%)	32 (64%)	0.003
Lumbar		44 (88%)	40 (80%)	0.275
Wrist		2 (4%)	20 (40%)	<0.001
Foot		0 (0%)	23 (46%)	<0.001
Risk factors				
Age Group	60- 69 years	33 (66%)	29 (58%)	0.410
	≥ 70 years	17 (34%)	21 (42%)	
BMI Group	normal	32 (64%)	16 (32%)	0.002
	Over-Weight obese	7 (14%) 11 (22%)	7 (14%) 27 (54%)	

Smoking	Non-smoker	20 (40%)	100 (100%)	<0.001
	Ex-smoker	28 (56%)	0 (0%)	
	Smoker	12 (24%)	0 (0%)	
Mechanical loading risk factors				
Lift or carry heavy objects?	33(60%)		38 (76%)	0.271
Keep your affected joint in uncomfortable positions?				
-Lower limb	31(62%)		39 (78%)	0.081
-Hand and wrist	5 (10%)		10 (20%)	0.161
-Cervical	10 (20%)		18 (36%)	0.075
-Lumbar	21 (42%)		34 (68%)	0.001<
Repeat the same movements continuously?				
-Lower limb	15		39	0.001<
-Hand and wrist	3		8(16%)	0.110
-Cervical	6		18 (36%)	0.005
-Lumbar	23		32 (64%)	0.070

The prevalence of radiographic and symptomatic knee OA was 42.8% and 15.4% respectively among the women aged 60 years and over in Beijing, higher than those in Caucasian women of the same age. The prevalence of radiographic and symptomatic knee OA were 27.6% and 7.1% respectively among the men aged 60 and over in Beijing, similar to those in the Caucasian men of the same age ⁽²⁸⁾.

Among 1041 subjects aged 71–100 years (36% men), the prevalence of symptomatic hand OA, by symptoms and radiology, was higher in women (26.2%) than in men (13.4%) ⁽²⁹⁾. which is in accordance with our data.

Manchikanti et al, reported that facet cervical joint pain was 39%, and 61% in males and females respectively in the age group between 61- 70 years ⁽²⁷⁾, these agree with our results.

After age 50 years, women are more often affected with hand, foot and knee OA than men ⁽³⁰⁾⁽³¹⁾.

Zoetermeer survey study demonstrated that the prevalence of 1st MTP joint in males is

ranging between 10.1 % to 44.4%, while in females is ranging between 18.8% up to 61%(according to severity of radiology, and 5 year intervals of age groups above 60 years) ⁽³⁰⁾, their higher percentage could be attributed to the diagnosis only by radiology.

In addition, most of our patients are recruited from outpatient clinics of geriatric and physical medicine, this explains the higher percentages of both knee and hip OA, because patients with hip and/ or knee OA could seek medical advice more than others. As both hip OA, along with OA of the knee, affect the ability to walk and climb stairs more than any other disease ⁽³²⁾⁽³³⁾

Moreover, the prevalence of moderate-to-severe hip OA is significantly higher among Caucasians ⁽³⁴⁾.

Furthermore, this explains the lower percentage of hand OA in comparing with knee OA, as supported by Oliveria et al, who mentioned that care seeking for symptomatic hand OA was substantially less frequent than for symptomatic knee OA in the Fallon Health Maintenance Organization ⁽¹⁵⁾.

By studying risk factors:

Lau et al studied knee and hip OA in hospitalized patients, excluding secondary OA, taking into considerations factors associated with OA; kneeling and squatting at work and high BMI. Among cases only, Lau et al. reported lifting heavy objects in up to 84% and both squatting and kneeling percentage of 75% among those with either knee or hip OA ⁽³⁵⁾, which is near to our results.

In the current study, 62% of patients had age between (60-69 years) and 38% of patients had age ≥ 70 years. In addition, 48% of patients had normal BMI (BMI=18-25), 14% of patients were overweight (BMI=26-29), while 38% of patients were obese (BMI=30-39); there was equal sex frequency and smoking was present in 70%, ex-smoking was evident in 28%, and in nonsmokers was evident in 12%.

Regarding mechanical loading risk factors, in *Rossignol et al.* study, agricultural workers reported exposure of both genders to lifting and uncomfortable positions ⁽³⁶⁾.

Therefore reporting individual risks in each occupation could delineate the actual risks than the overall occupation.

By comparing risk factors in both genders:

There was no statistically significant age difference in both genders, while there was statistically significant high BMI in females versus males. There was statistically significant higher smoking evidence in males than females.

Studying occupational risk factors in both genders, revealed that in females there was statistically highly significant higher experience of uncomfortable positions of lumbar spine; and same movement

repetition of lower limb joints and cervical joints.

In males, exposure to carrying of heavy objects, higher experience of uncomfortable positions and higher experience of repeated movements are significantly associated with knee OA, hand and lumbar OA in all, and hip in uncomfortable position and cervical OA with repeated movement risk.

On the other hand, in females, there is significant association between higher experience of repeated movements and knee, hand, wrist, cervical, and lumbar OA.

Farmers have high rates of hip OA ⁽³⁷⁾. When specific job tasks were examined, jobs requiring kneeling or squatting along with heavy lifting were associated especially with high rates of both knee and hip OA. Forces across the knee increase in the crouching or squatting position; lifting loads from such a position further increases loading. Data from the Framingham Study suggest that such job activities cause anywhere from 15% to 30% of knee OA in men ⁽¹⁹⁾. Other occupational activities, including climbing stairs, walking on uneven ground, standing, and sitting, have been inconsistently linked to OA risk ⁽³⁷⁾.

Occupation had been found to be associated with spinal OA in some groups ⁽³⁸⁾⁽³⁹⁾.

Similarly, *Rossignol et al.*, studied Primary OA of hip, knee, and hand in relation to occupational exposure, and reported that repetition of movements was associated with hand OA ⁽³⁶⁾.

Lifting heavy weights is linked to knee OA by Lau et al study who studied occupational risk factor ⁽³⁵⁾ that is similar to the current data.

Occupational-exposure patterns contributed to the definition of groups at risk and will guide future research.

Conclusion

Females have overall and individualized sites (including: knee, hand, wrist, cervical and foot) OA more than males, and higher risk factors than males (including BMI and repeating the same movement in many sites).

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