Functional Disability of Filipino Patients with Hand Osteoarthritis seen at a Rheumatology Outpatient Clinic of a Tertiary Government Hospital

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Abstract

Introduction: Osteoarthritis (OA) is a common joint disease which may cause functional limitation in daily activities. The aim of this study is to determine disability of patients with hand osteoarthritis (HOA) using the Disability of Arm, Shoulder and Hand (DASH) questionnaire and to determine association of risk factors to the development of HOA.

Methods: This is a cross-sectional study done in a tertiary government hospital. Patients seen at the rheumatology outpatient clinic aged 40 years and above, diagnosed with primary OA of hands, knees, hips and spine based on American College of Rheumatology criteria and who gave written informed consent, were included. Patient characteristics were extracted. Descriptive statistics were used. Those with HOA were compared to those without HOA, as to biomechanical stress, menopause, body mass index (BMI) and family history. They were made to complete the DASH questionnaire. Data was analyzed using chi-square and logistics regression analysis to determine association of risk factors for HOA.

Results: One hundred fifty patients with primary OA were included; 61.3% were between 60-79 years, 92% were female. Forty-one percent were obese, 55.3% had family history of OA. There were 88 cases of HOA (59%). Mean age at onset is 58.2±8.8 years, mean age at diagnosis is 61.8±9.6 years. The most common complaints were stiffness and pain (60.3%), stiffness only (29.5%) and pain only (10.2%). The average DASH is 28.7±15.6 (mild disability), seen in 59.1%, moderate disability in 37.5% and severe in 3.4%. Among the risk factors for the development of HOA, there was a trend for menopause, BMI and biomechanical stress to increase risk of HOA. Among the biomechanical factors, cooking, laundry and cleaning showed a trend toward increasing risk two-fold.

Conclusion: This study showed that half of patients with primary OA in the study had HOA that was mildly disabling in a majority, and moderately disabling in 1/3 of cases. There may be correlation with biomechanical factors in its development. Other important risk factors for its development need to be further studied in a larger cohort of patients.

Keywords: hand osteoarthritis, disability, risk factors

Introduction

Osteoarthritis (OA) is a disease of the joint involving the cartilage, joint lining, ligaments and underlying bone. It is one of the most common joint disorders and causes functional limitation in adults.[1] Hand joint involvement is significant as it may affect physical function in daily activities.

The prevalence of symptomatic radiographic hand osteoarthritis (HOA) in the United States from 2001-2005 is eight percent overall with predominance in females according to a Center for Disease Control and Prevention article. In the Epidemiological Study of Rheumatic Diseases in Greece (the ESORDIG Study), the prevalence of symptomatic HOA is two percent.[2] A study by Racaza et al. in 2012 described 859 patients with primary OA in two arthritis clinics in the Philippines from 2008-2011. Thirteen percent of these patients have HOA.[3]

Hand OA (HOA) may be associated with pain, stiffness, diminished grip strength and loss of range of motion; making usual daily tasks difficult to perform.[4] A number of these patients seek consult when significant impairment of hand function has already occurred.[3] Even though the effects may be debilitating, the impact of HOA is not routinely evaluated and there are few studies done to investigate hand function.[1] In our country, there is paucity of data on HOA and there is no data among Filipinos regarding disability caused by HOA. The goal of the study is to describe the functional disability of Filipino patients with HOA using the Disability of Arm, Shoulder and Hand (DASH) questionnaire and to determine the relationship of the different factors related to the development of HOA.

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The translated version in Filipino by Dr. Emmanuel P. Estrella and Dr. Nathaniel S. Orillaza, Jr. of the DASH questionnaire will be used in the study. This questionnaire is able to score for disability and symptoms of HOA.[5,6]

Methods

This is a cross-sectional study done in the rheumatology outpatient clinic of a tertiary government hospital in Manila, Philippines. All adult patients aged 40 years old and above, diagnosed with primary OA (knees, hips, spine, hand) based on American College of Rheumatology (ACR) criteria for primary OA and seen at a tertiary hospital rheumatology outpatient clinic who gave their written consent were included in the study.[8] Presence of HOA among the included population was determined using the ACR criteria for HOA. Demographic data and history were obtained. They were given the DASH questionnaire individually which they completed during clinic consult. The questionnaire was read to those who are unable to read or write, by the investigators or the patient's relative.

Patients with secondary OA (systemic lupus erythematosus, rheumatoid arthritis, psoriatic arthritis and other inflammatory arthritis affecting small joints of the hands, monoarticular post-traumatic OA, Parkinson's Disease, neurologic diseases (stroke with upper limb residuals) and those with carpal tunnel syndrome were excluded.

Non-probability sampling was used. Sample size was calculated using OpenEpi Epidemiologic Calculator given the population size of 112, which was based on the 13% incidence of HOA among 859 patients with primary OA seen by Racaza et al.[3] Other parameters used for calculation were as follows: 50% +/- 5% hypothesized % frequency of outcome factor in the population, 5% confidence limits as % of 100, and a design effect of one.

Descriptive (frequency, mean, standard deviation, ranges) statistics was used to characterize the patients while analytical statistics (chi-square, logistic regression) was used to establish association of HOA with family history, BMI, menopause and biomechanical factors. A *p*-value of less than 0.05 was considered statistically significant.

Family history, heavy hand intensive work by biomechanical stress exposure, hormonal status, body mass index (BMI) were analysed to compute for association. For this analysis, patients were grouped to those with or without HOA and compared.

This study has been approved by the University of the Philippines Manila Research Ethics Board (UPMREB) Philippine General Hospital Panel. All patients gave written informed consent to their participation in the study. Partaking in the study was voluntary and there was no monetary compensation. The patients were given a corresponding code number to secure their identities. The data gathered and the files collected were kept by the investigator to ensure confidentiality. There was no conflict of interest in any form. There were no risks involved in participating in this study.

Results

One hundred fifty patients with primary OA of the hands, knees, hips and spine were included in the study. Most (61.3%) of the patients' ages are in the range of 60-79 years while 32% are in the 40-59 year old. There is a female predominance (92%). Forty-one percent are obese and almost 25% are overweight. The mean age at menopause was 48.3±5.7 years. More than half of the patients (55.3%) have family history of OA. (Table I)

Eighty-eight patients of the total population have HOA. In Table II, the characteristics of patients with OA of the knees, hips and spine are described. The mean age at onset of symptoms of primary OA without HOA is 58.8±9.5 years while those with HOA is 60.3±9.8 years.

There is a mean of 5.9 nodes in the proximal interphalangeal (PIPs) joints and 3.4 nodes in the distal interphalangeal (DIPs) joints. The mean age at onset of symptoms of HOA is 58.2±8.8 years and the mean age at diagnosis is 61.8±9.6 years; there is a mean of three years

Table I. Disease characteristics of Filipino patients with primary osteoarthritis seen in a tertiary government hospital in Manila, Philippines (N=150)

Characteristics	n (%)
Age in years	
40-59	49 (32.7)
60-79	92 (61.3)
≥80	9 (6.0)
Sex	
Male	12 (8.0)
Female	138 (92.0)
BMI (kg/m^2)	
<23	51 (34.0)
23–24.9	37 (24.7)
≥25	62 (41.3)
Age at menopause in years (Mean±SD)	48.3±5.7
Educational background	
No education	2 (1.3)
Elementary	38 (25.4)
High school	54 (36.0)
Vocational	11 (7.3)
College	45 (30.0)
Post-graduate	0 (0.0)
Family history of OA	
Yes	83 (55.3)
No	67 (44.7)

duration of symptoms prior to diagnosis. In patients with HOA, stiffness and pain in both hands (60.3%) is the most common complaint, followed by stiffness only (29.5%) and pain only (10.2%). (Table III) Average DASH score is 28.7±15.6. Figure 1 illustrates that almost 60% of patients with HOA have mild disability based on DASH score.

Table IV demonstrates relationship of the risk factors of OA to patients with HOA. In patients with HOA, 56% have family history of OA; 37.5% are obese and 26% are overweight; 91% of females are menopausal.

Among the risk factors, there is a trend for menopause, BMI and biomechanical stress to increase risk of HOA. Among the biomechanical factors, cooking, laundry and cleaning showed a trend toward increasing risk two-fold.

Discussion

Osteoarthritis (OA) is the most common joint disease. Although HOA is frequently regarded as mild, and stiffness and pain, subtle, its chronicity and irreversibility may contribute to disability as it affects function of the hand which are indispensable in doing activities of daily living. OA is common in patients more than 40 years old and above with a female predominance.[3] Data on age, is comparable to our cohort where 60% are in the range of 60-79 years old and majority (92%) are female. Age is considered a risk factor for OA since with aging, the response to stress in the joint may not be sufficient to overcome bone destruction.[8] There are different factors that may lead to the development

Table II. Disease characteristics of OA (N=150)

Parameter	With HOA	Without HOA
Age (in years)	Mean±SD	
At onset of symptoms (other than hand)	60.3± 9.8	58.8 ± 9.5
At diagnosis	63.2± 10.2	61.5 ± 9.4
OA location	Frequency	
Knee OA	85	61
Hip OA	4	6
Spine OA	7	3

Table III. Disease characteristics of HOA in Filipino patients (N=88)

Parameter	Mean±SD
For HOA	
Age at onset of symptoms in years	58.2± 8.8
Age at diagnosis in years	61.8± 9.6
	Frequency (%)
Number of nodes involved	
1st CMC (range: 0-2, mode: 0)	0.1
IP (range: 0-2, mode: 2)	1.3
PIP (range: 2-8, mode: 8)	5.9
DIP (range: 0-8, mode: 2)	3.4
HOA Symptom/s	
Stiffness	26 (29.5)
Pain	9 (10.2)
Both	53 (60.3)
DASH severity scale	
Average (mean±SD)	28.7±15.6
Mild	52 (59.1)
Moderate	33 (37.5)
Severe	3 (3.4)

CMC – carpometacarpal joint; IP – interphalangeal joint; PIP – proximal interphalangeal joint; DIP – distal interphalangeal joint

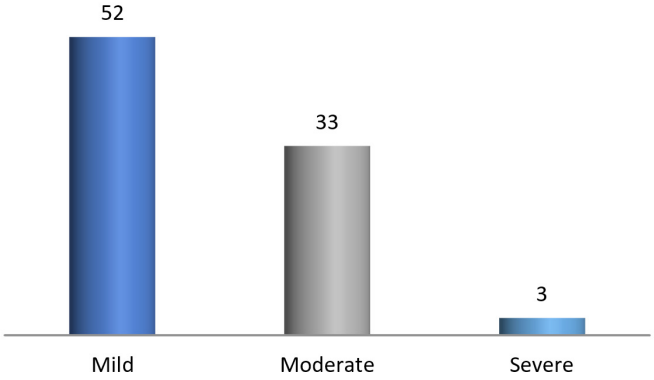

Figure 1. Compliance for the SSC bundle

Table IV. Factors related to the development of HOA

Risk factors	Patients w/ HOA (N=88)	Patients w/o HOA (N=62)	*p*-value	Odds ratio 95% C.I.*
Family history				
With OA (n=83)	49	34	0.92	1.03 (0.54, 1.99)
Without OA (n=67)	39	28		
BMI (kg/m^2)				
< 23 (n=51)	32	19	0.47	1.29 (0.65, 2.62)
≥ 23 (n=99)	56	43		
Hormonal factor (menopause)				
Menopause (n=130)	80	50	0.18	1.95 (0.74, 5.20)
Not in menopause (n=20)	9	11		
Biomechanical stress				
Cooking				
Yes	82	53	0.14	2.31 (0.77, 7.34)
No	6	9		
Laundry				
Yes	78	48	0.07	2.26 (0.93, 5.67)
No	10	14		
Ironing				
Yes	67	41	0.19	1.63 (0.79, 3.37)
No	21	21		
Sewing				
Yes	19	10	0.42	1.43 (0.62, 3.45)
No	69	52		
Cleaning				
Yes	83	54	0.14	2.44 (0.75, 8.61)
No	5	8		
Typing				
Yes	5	4	0.84	0.87 (0.21, 3.80)
No	83	58		
Garden work/ farming				
Yes	7	6	0.72	0.81 (0.22, 3.08)
No	81	56		

**(lower limit, higher limit)*

of HOA. These are increased age, gender (female) and genetics. Symptomatic OA of the hand occurs in 5-20% of the population ≥40 years.[10, 11] Other studies report the mean age of HOA as 58.8+4.8 years similar to our group in which the mean age at onset of symptoms of HOA is 58.2±8.8 while mean age at diagnosis is 61.8±9.6.[9]

The incidence of OA also increases in women especially at menopausal age. In this study, the mean age at menopause is 48.3+5.7 years among female patients, which is parallel to a local study (49.5 yrs) done in 2012.[3] The effect of hormones as a factor for development of HOA is still not clear though in some studies, estrogen was shown to be protective. Erosive HOA and involvement of the base of the thumb are also frequently seen in postmenopausal women.[11,2] Many of our patients noted nodal HOA after menopause.[9,13]

Majority of our patients have high BMI. Obesity in Asians, defined as BMI of more than 25 kg/m^2, is one of the established risk factors for knee OA but there are also studies that support its role in the development of HOA probably by metabolic aberrations.[8,13,14] Majority of our patients are obese (41%) analogous to the findings (48.8%) of Racaza et al. in 2012.[3] In addition to OA, obesity is also associated with metabolic syndrome therefore surveillance for insulin resistance and dyslipidemia are warranted in the work up of these patients with OA.[8]

Another risk factor linked to OA is family history. Genetic studies are being done to identify which genes are involved in HOA. According to Spector et al. in 2004, twin studies have shown that the influence of genetics in OA is 39-65% in radiographic OA of the hand and knee in women.15,16 In our group, 55% of our patients have family history of OA however its relationship to patients with HOA was not statistically significant.

In general, the most common chief complaint in OA is pain (92.8%).[3] However, due to the insidious course of HOA, only few patients complain of symptoms as primary reason for consult. In fact, HOA may be diagnosed incidentally during physical examination for another joint complaint such as knee OA. In our patients, pain was noted in 10.2%, stiffness in 29.5% and 60.3% had both pain and stiffness of hands.

Nodal involvement is characteristic of HOA. Spacek et al in 2004 described that the most common joint affected are the DIPs (20%) followed by base of the thumb (8%) and PIPs (5%).[17] In this study, the mean number of involved DIPs is 3.4 and 5.9 in PIPs. This is lower compared to the study by Ceceli et al. in 2012, where 60 Turkish patients with HOA had predominance of Heberden's nodes (mean number of nodes 7.9) followed by Bouchard's nodes (mean number of nodes 3.2). CMC involvement in the latter was also seen in 16.7% (unilateral) and 46.7% (bilateral) while in this cohort, only two patients had their CMCs affected.[13] Local data showed that in 859 patients with primary OA, 13% had Heberden's nodes, 4.8% had Bouchard's nodes.[3]

Hand usage through occupational exposure, work with repetitive hand movement and mechanical factors are commonly associated with HOA development though the evidence of causality is scarce.[13,16,18] A study in Turkey identified the common activities that patients with HOA usually do. These are sewing (38.3%), gardening (28.3%), cleaning (16.7%), pastry (3.3%).[5] In contrast to our study, most of the patients' activities involve cleaning (94.3%), cooking (93.2%) and laundry (88.6%).

Various studies in OA often present the burden of the disease in patients with hip and knee OA. HOA, though it has a slow process, can also affect patients' activities of daily living. The average DASH in this study is 28.7±15.6, milder compared to other studies where the mean DASH score is 48.3+26.3.[9] Nevertheless, the impact of this disease as a burden should be addressed since HOA may lead to functional limitation and disability.

Disclosure: None to disclose
Conflict of interest: There are no companies or for-profit organizations that have an association with this study.

Conclusion

This study shows that this cohort of patients has mostly mild disability caused by HOA. Several risk factors may be associated with development of disability caused by HOA among Filipinos, and need to be further studied in a larger cohort of patients.

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