

# The Disability Associated with Hand Osteoarthritis is Substantial in a Cohort of Post-menopausal Women: The QUALYOR Study

Auroux M<sup>1</sup>, Merle B<sup>2</sup>, Fontanges E<sup>1</sup>, Duvert F<sup>1</sup>, Lespessailles E<sup>3</sup>, Chapurlat R<sup>1-2</sup>

<sup>1</sup> Hôpital E Herriot, Hospices Civils de Lyon, 69437 Lyon Cedex 03 Lyon, France

<sup>2</sup> INSERM UMR 1033, Université de Lyon, Hôpital E Herriot, 69437 Lyon Cedex 03, France

<sup>3</sup> Centre Hospitalier Régional d'Orléans, Université d'Orléans, Orléans, France

## Purpose

Osteoarthritis (OA) is a highly prevalent disease and hand osteoarthritis (HOA) is one of the most frequent forms of OA. The prevalence is variable depending on the definition used and the population studied. It has been suggested in a few studies that disability may be comparable to that seen in rheumatoid arthritis (RA) but few studies have investigated disability related specifically to hand OA. As HOA is more frequent than RA, the burden of disease could be greater. The aim of this study was to determine the prevalence of HOA and to systematically assess the disability associated with HOA, along with its correlates, in a cohort of post-menopausal women, the QUALYOR study (Qualité Osseuse Lyon Orléans).

## Methods

The QUALYOR study was originally designed to assess the performance of various imaging methods to predict osteoporotic fracture risk. At the 72-month follow-up visit of the study, we performed hand radiographs, clinical examination assessing pain, nodes and deformations, grip strength measurement, AUSCAN and COCHIN questionnaires. Radiographic hand OA (RHOA) was defined as at least 2 joints among 30 grading 2 or more using the Kellgren Lawrence score. Symptomatic HOA (OA ACR) was defined according ACR criteria for hand OA. Moderate to severe symptomatic HOA was defined as having SHOAs and AUSCAN total score of > 43/100 (threshold previously identified as the level of non-acceptable disability in HOA).

Patients characteristics and results were reported using frequencies and percentages for categorical variables and means and standard deviations for continuous variables. Inter-reader and Intra-reader reliability were evaluated using Intraclass-Correlation Coefficient (ICC). Quantitative variables were compared using t-tests. We also performed a multivariate analysis using linear regression models including age and BMI.

## Results

We have included 1189 participants. Characteristics of the population at the time of osteoarthritis evaluation are described in Table 1. The mean age was 71.7 years.

Inter-reader reliability of radiographs reading in our study was good (ICC = 0.86) and intra-reader reliability was excellent (ICC = 0.97).

### Prevalence :

Radiographic osteoarthritis was observed among 815 out of 1189 participants (68.5%). Of note, 194 of 815 patients (23.8%) presented at least 1 erosion on radiographs.

Out of 815 patients, 482 with RHOA (59.1%) fulfilled ACR criteria for symptomatic hand OA (40.5% of the entire cohort). The prevalence of symptomatic erosive osteoarthritis was 11.8% (141 out of 1189).

Patients with BMI > 30kg/m<sup>2</sup> had a relative risk of symptomatic OA of 1.27 IC95% [1.05-1.53]. We didn't find an association between HOA status and diabetes mellitus (RR 1.13 IC95%[0.97-1.32] for RHOA and RR 1.13 IC95%[0.85-1.55] for symptomatic HOA). We have found a weak association between HOA status and hypertension (RR 1.12 IC95% [1.04-1.21] for RHOA and RR 1.18 [1.03-1.36] for symptomatic HOA) and dyslipidemia (RR 1.11 IC95%[1.02-1.20] for RHOA and RR 1.19 IC95%[1.02-1.38] for symptomatic HOA). Among the 482 symptomatic patients, 82 (17.0%) fulfilled the criteria for moderate to severe symptomatic hand OA (6.8% of the entire cohort, 10.1% of women with RHOA).

#### Disability :

The mean AUSCAN score in patients without RHOA, in patients fulfilling ACR hand OA criteria and in patients with moderate to severe HOA were respectively 11.45, 23.46 and 59.15, out of a range from 0 to 100. Differences between these were statistically significant ( $p < 0.001$ ) and persisted after adjustment for age and BMI ( $p < 0.001$ ).

The mean Cochin Scores were also significantly different across these 3 categories ( $p < 0.001$ ) at 19.98/90, 23.22/90 and 34.23/90 respectively.

The mean Grip strength measured at the right hand (similar with the results with left hand) was significantly different for those 3 categories, respectively 23.47kg, 21.46kg and 18.33kg ( $p < 0.05$ ) after adjustment for age and BMI).

Boxplots in Figure 1 summarize these results.

In our cohort, two subgroups of interest seem to have a higher level of disability: erosive hand osteoarthritis and HOA involving thumb base.

#### **Conclusions**

In our cohort of post-menopausal women aged at least 55 years, we observed a high burden of disease, two thirds having RHOA, one sixth of symptomatic patients had moderate to severe HOA related disability and a tenth had symptomatic erosive osteoarthritis. Moreover, 20% of our women have a Cochin score higher than mean Cochin scores published to date in cohorts of rheumatoid arthritis patients.

Table 1. Population characteristics at the time of osteoarthritis evaluation

Age (years) mean (SD)	71,7 (6,4)
Age class	N (%)
- 55-60 years	- 18 (1.5%)
- 60-65 years	- 173 (14.6%)
- 65-70 years	- 308 (25.9%)
- 70-75 years	- 334 (28.1%)
- 75-80 years	- 221 (18.6%)
- 80-85 years	- 96 (8.1%)
- 85-90 years	- 32 (2.7%)
- 90-95 years	- 4 (0.3%)
- NA	- 3 (0.2%)
BMI (kg/m2) mean (SD)	24,9 (4,0)
BMI class	N (%)
- < 18 kg/m2	- 16 (1.3%)
- 18-25 kg/m2	- 638 (53.6%)
- 25-30 kg/m2	- 405 (34.1%)
- 30-35 kg/m2	- 109 (9.2%)
- > 35 kg/m2	- 15 (1.3%)
- NA	- 6 (0.5%)
Diabetes mellitus	52 (4,4%)
Hypertension	417 (37,1%)
Dyslipidemia	284 (23,9%)
Chronic Inflammatory Arthritis	21 (1,8%)
Smokers: N (%)	52 (4,4%)
- Dose (pack per week) mean (SD)	- 0,25 (5.3)
Alcohol consumer N (%)	437 (36,8%)
- Dose (unit per week)	- 1,77 (3.59)
Bone densitometry (g/cm2)	mean (SD)
- Spine	- 0,85 (0.11)
- Hip	- 0,77 (0.08)
- Neck	- 0,64 (0.07)
Dominant hand :	N (%)
- Right	- 1126 (94.7%)
- Left	- 63 (5.3%)

Figure 1. Boxplots representing AUSCAN total score (panel A), Cochin score (panel B) and Grip strength (panel C) in population without radiographic OA, with symptomatic OA (OA ACR) and moderate to severe OA

\*\*\* p-value < 0,001 \* p-value < 0,05 (OA ACR compared to No RHOA and Moderate to severe OA compared to No RHOA)

