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LIMITATIONS IN DAILY ACTIVITIES ARE THE MAJOR DETERMINANT OF REDUCED HEALTH-RELATED QUALITY OF LIFE IN HAND OSTEOARTHRITIS PATIENTS

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ABSTRACT

Objective

To determine the impact of limitations in daily activities and pain on quality of life (QoL) in osteoarthritis (OA) patients visiting a rheumatologist.

Methods

Patients diagnosed by the rheumatologist with primary hand, knee or hip OA were consecutively included from August 2005-April 2009. QoL was assessed by Short Form-36 with the physical component summary score (PCS), calculated by using data from a norm-based population. Self-reported pain and function in hand OA patients were assessed by the Australian/Canadian OA hand index (AUSCAN) pain (range 0-20) and AUSCAN function (range 0-36). Linear regression analyses were performed to investigate associations between PCS and demographic characteristics, and between PCS and pain and function in patients with OA.

Results

Hand OA was diagnosed in 95 % of 460 included patients (89% women, mean age 61 years). PCS was lowered in patients with OA. Patients with hand OA reported a considerable amount of pain (mean 9.5 (SD 4.3)) and disability (mean 16.5 (SD 8.6)). AUSCAN function was associated with PCS (adjusted beta -0.3, CI 95% -0.4 to -0.2), but AUSCAN pain not.

Conclusions

Hand OA was the most common OA subtype in secondary care. Health-related QoL is decreased in patients with OA and is associated with limitations in daily activities.

INTRODUCTION

Knowledge concerning osteoarthritis (OA) results mainly from studies in the general population^{1,2}, in which many participants have only radiographic OA with no or mild complaints³. Data in symptomatic patients with OA are scarce and deal almost exclusively lower extremity OA.⁴ Knowledge about hand OA is limited and research in patients with hand OA is mostly performed in selected patient populations^{5,6}.

Our objectives were to describe the phenotype of OA patients in rheumatology practice, to compare patients with OA with the general population, to investigate their health-related quality of life (HRQoL) and to assess their most important problem (pain or impaired function).

PATIENTS AND METHODS

Patient population

This study was performed at the Rheumatology outpatient clinic of the Leiden University Medical Center, Netherlands from August 2005 to April 2009. Patients diagnosed by the rheumatologist with primary hand, knee or hip OA were referred to the clinical nurse specialist and consecutively included. Clinical diagnoses of primary OA were verified by the medical chart.

Demographic characteristics

Collection of demographic and anthropometric data was performed by standardized questionnaires. Lower education was defined as persons who did not receive education, went to primary school only or received lower vocational education.

Random Digit Dialing population

Middle-aged controls (n=345, mean age 57 years, Leiden region) were recruited by random sampling of the population by telephone; the Random Digit Dialing (RDD)⁷. The control group was originally frequency matched to another case group in a previous study and relatively more men (36%) were included⁸. Therefore all analyses are adjusted for age and sex.

Radiographic diagnosis of OA

Osteophytes (OST) and joint space narrowing (JSN) were scored by the OARSI scoring method⁹. Radiographic hand OA was defined as OST or JSN grade ≥ 1 in the distal, proximal, thumb interphalangeal joint (DIPJ, PIPJ, IPJ respectively), metacarpophalangeal joint (MCPJ) and first carpometacarpal joint (1st CMCJ)¹⁰. Erosions were scored by the Verbruggen-Veys scoring method and were defined as having eroded or remodeled subchondral plates (R-phase) in DIPJs, PIPJs or IPJs¹¹. Radiographs were scored by WYK, blinded for clinical and demographic data. To calculate intraclass correlation coefficients (ICC), a random sample of 10% was scored twice. The ICC (95% confidence interval) for OST and JSN scores were 0.93 (0.81 to 0.97) and 0.89 (0.76 to 0.95), respectively. The intraobserver reliability of erosions, expressed by kappa statistics, was 0.94.

Health-related quality of life

HRQoL of patients with OA was measured by summary component scores for physical health (PCS) and mental health (MCS) in the Short-Form 36. Scores of a Dutch general population were used to standardise our scores to apply the norm-based scoring since no information about HRQoL was available in RDD-controls¹².

All scores were standardized to a mean of 50 with a standard deviation (SD) of 10¹³. Lower scores represent worse health status.

Self-reported pain and function in hands

Self-reported pain and function in patients with hand OA were measured with the disease-specific questionnaire Australian/Canadian OA hand index (AUSCAN) Likert scale 3.1. containing 5 items for pain, 1 for stiffness and 9 for physical functioning¹⁴. Each item is scored from 0 (best) to 4 (extreme). AUSCAN subscales range from 0 to 20 for pain, 0 to 36 for function and 0 to 60 for total.

Statistical analysis

Data were analyzed by SPSS, version 16 (SPSS Inc, Chicago, Illinois). Multivariate logistic regression analyses were used for comparison of demographic characteristics between patients with OA and RDD controls. Results were presented as odds ratio (OR) with a 95% confidence interval (95%CI), with adjustments when appropriate.

Linear regression analyses were performed for continuous outcomes in patients with OA (dependent variables: PCS, MCS; independent variables: AUSCAN total score, function and pain). Results were presented as beta-estimates (95%CI), with adjustments when appropriate.

RESULTS

Population of patients with OA

The clinical nurse specialist included 487 patients with OA in the study. After verification of the medical chart 27 patients were excluded due to concomitant musculoskeletal disorders (e.g. rheumatoid arthritis (RA), hemochromatosis, psoriatic arthritis, acromegaly).

Comparison of patients with OA with RDD controls

Four-hundred sixty patients were included, of whom the majority were middle-aged and women (Table 1). More patients in the OA population were overweight, married and had paid employment than controls, not only adjusted for age and sex, but also for all other demographic characteristics (e.g. employment is adjusted besides for age and sex, also for BMI, marital status, low education and smoking). Categorization of cohabitating patients with married patients did not change the results.

Table 1: Baseline characteristics of patients with OA and RDD-controls.

Baseline characteristics In no.	Patients with OA N=460	RDD-controls N=345	Adjusted OR* (95%CI)
Female (%)	405 (88)	221 (64)	-
Age, years, mean (range, SD)	61 (35-85, 9.9)	57 (40-76, 9.2)	-
BMI, >25 kg/m ² (%)	226 (60)	160 (46)	1.6 (1.2 to 2.3)
Marital status (%)	300 (65)	206 (60)	1.8 (1.3 to 2.6)
Employment (%)	148 (32)	100 (29)	2.2 (1.6 to 3.2)
Low education (%)	160 (23)	115 (33)	0.8 (0.6 to 1.3)
Current smoking (%)	67 (22)	90 (26)	0.7 (0.4 to 1.0)

Results are shown as number (%) unless stated otherwise.

* Adjustment for age, gender and all other demographic characteristics in the table.

BMI = body mass index, OA = osteoarthritis, RDD = random digit dialing.

OA phenotypes

Monoarticular joint site involvement (mono OA) was seen in 244 patients; 94% had hand involvement. OA in more than one joint site (poly OA) was present in 216 patients; 97%, 43% and 11% had hand, knee and hip OA, respectively.

Of all hand OA patients (n=439), 7.7% reported pain in 1st CMCJs only, 41.2% in DIPJs and PIPJs only and 42.8% in 1st CMCJs with DIPJs/ PIPJs.

Radiographic hand OA

Hand radiographs were made in 247 (56%) of 439 hand OA patients, showing radiographic OA in the DIPJs, PIPJs, IPJs or 1st CMCJs in 244 (99%) patients. At least one erosion in DIPJs, PIPJs or IPJs was seen in 61 of 247 patients (25%), 41 patients showed ≥ 2 erosions. No differences in demographic characteristics, self-reported pain and function were seen between the groups with or without radiographs (data not shown).

Quality of life

Patients with OA reported a lower PCS than the norm-based population (mean 43, Figure 1). MCS was similar to that of the norm-based population. The PCS score was positively (representing better physical QoL) associated with marital status and negatively (representing worse physical QoL) with overweight. Patients with mono OA reported a better PCS (beta 2.5, CI 95% 0.7 to 4.3) than patients with poly OA (supplementary table S1).

Self-reported pain and disability

Patients with hand OA (n=439) reported means (SD) of 28.0 (2.6), 9.5 (4.3) and 16.5 (8.6) on the AUSCAN total, pain and function subscales, respectively. When comparing patients with and without 1st CMC involvement, PCS was 2.0 (95%CI -3.9 to -0.1) lower for patients with involvement, adjusted for the number of symptomatic hand joints (supplementary table S2).

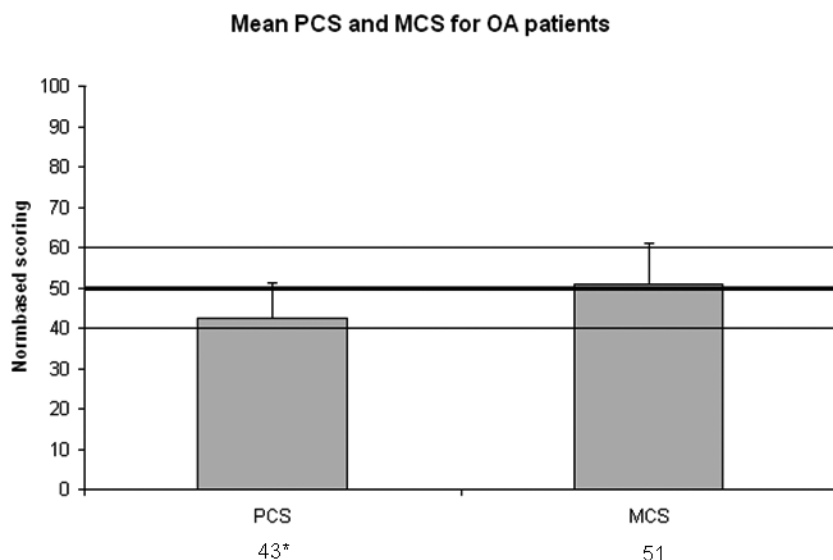


Figure 1: Mean Short-Form 36 PCS and MCS in patients with OA, in comparison with the general Dutch population using norm-based scoring. Bold middle line = mean score of 50; the average score for PCS and MCS in the general population. Upper and lower lines = a standard deviation of 10 (SD) of PCS and MCS in the general population. MCS = mental component summary score of Short-Form 36, OA = osteoarthritis, PCS = physical component summary score of Short-Form 36.

Association between self-reported pain and disability with HRQoL

Self-reported disability was associated with lower health-related QoL (adjusted beta -0.3, CI 95% -0.4 to -0.2). If patients reported more disability, they reported worse HRQoL. No associations were seen between self-reported pain and HRQoL (Table 2).

DISCUSSION

Most patients with OA in rheumatology practice have hand OA, with or without involvement of other joint sites. The majority of these patients are women, more often overweight, married and having employment than controls from the general population. HRQoL is lowered in patients with hand OA and is associated with disability, but not with pain. Clear focus on improvements of hand function seems relevant in treatment of these patients.

The predominance of hand OA in rheumatology practice reflects the referral policy in the Netherlands. Patients with hand OA visit rheumatologists, especially when there is doubt about the inflammatory or degenerative origin of disease. Patients with hip and knee OA will be referred to orthopedic surgeons.

Physical HRQoL was lowered in all patients with OA. This result was in line with an earlier study reporting a lower HRQoL in 190 female hand OA patients than in healthy controls^{5,15}. In these patients, worse mental health was also seen, which was

Table 2: Association between AUSCAN with SF-36 PCS and AUSCAN with SF-36 MCS (n=439).

AUSCAN scales	Beta-estimate PCS (95%CI)	P-value*	Beta-estimate MCS (95%CI)	P-value*
AUSCAN total	-0.3 (-0.4 to -0.2)	<0.001	-0.2 (-0.3 to -0.1)	<0.001
AUSCAN function	-0.4 (-0.5 to -0.2)	<0.001	-0.1 (-0.2 to 0.2)	NS
AUSCAN pain	-0.1 (-0.4 to 0.2)	NS	-0.3 (-0.7 to 0.1)	NS

*Adjusted for age, gender, marital state, low education, BMI (kg/m²), current smoking, paid employment, OA type.

AUSCAN = Australian/Canadian OA hand index, BMI = body mass index, OA = osteoarthritis, MCS = mental component summary score, PCS = physical component summary score.

not confirmed by us. Since our patient population represents the daily clinical practice in rheumatology and included consecutive patients (including men), it was possible to generalize the results to all patients with hand OA in secondary care.

Van der Kooij *et al.*¹⁶ studied HRQoL in patients with RA using the same norm-based data. Patients with RA have lower HRQoL at the beginning of their disease. But if disease activity after two years is decreased by therapy, HRQoL in patients with RA is better than our patients with hand OA. This study emphasizes the importance of the lower HRQoL in patients with hand OA.

Limitations in daily activities and pain are major problems in hand OA. Recently, Bijsterbosch *et al.* reported the clinical burden in different hand OA subgroups^{6,17}. Both studies were performed in patients who were selected with familial OA. In our study, we investigated HRQoL, pain and function in a less selected population and confirm the previous findings. Patients who visit the rheumatologist score even worse which supports the severity of patients in secondary care.

Interestingly, a higher score on AUSCAN function subscale in our study was associated with a lower HRQoL, but the AUSCAN pain subscale was not associated with HRQoL. It might be that pain is not the major problem causing patients visit rheumatologists. Another explanation might be that pain fluctuates over time (e.g. with inflammation) and is absent at the moment the clinical nurse specialist is visited.

A study limitation is that diagnosis of hand OA was based on rheumatologist opinion and not on American College of Rheumatology (ACR) criteria¹⁸. Diagnosis by rheumatologists reflects the clinical reality. Unfortunately, not all radiographs from patients were available. It represents the course of daily clinical practice and is in line with ACR criteria stating that hand OA is a clinical diagnosis. However, available radiographs in patients with hand OA showed that most structural damage in hands was compatible with hand OA. No differences were seen in demographic and clinical characteristics between persons with or without a hand radiograph.

Supplementary table S1: Multivariate association of demographic variables with SF-36 PCS (n=460).

Variable	Beta-estimate (95%CI)*	P-value
Age	-0.1 (-0.2 to 0.05)	NS
Female	-1.6 (-4.3 to 1.1)	NS
Married	2.3 (0.3 to 4.2)	<0.05
Lower education	-1.2 (-3.2 to 0.7)	NS
BMI >25 kg/m ²	-0.4 (-0.6 to -0.2)	<0.001
Current smoking	-1.2 (-3.7 to 1.3)	NS
Paid employment	0.5 (-1.7 to 2.7)	NS
Mono OA	2.5 (0.7 to 4.3)	<0.01

* Adjusted for age, gender, marital status, low education, BMI (kg/m²), current smoking, paid employment, OA type.

MCS score was positively (representing better mental QoL) associated with marital status and negatively (representing worse mental QoL) with low education and smoking (data not shown).

Supplementary table S2: Mean scores of AUSCAN in hand OA (n=439) and its subgroups.

Variable	All patients with hand OA (n=439) Mean (SD)	1 st CMCJ complaints only (n=28) Mean (SD)	DIPJ/PIPJ complaints only (n=149) Mean (SD)	1 st CMCJ with DIPJ/PIPJ complaints (n=155) Mean (SD)	P-value
AUSCAN					
total	28.0 (2.6)	26.5 (11.6)	25.4 (11.5)	32.2 (10.5)	<0.01
pain	9.5 (4.3)	9.3 (4.3)	8.9 (4.0)	10.8 (3.6)	<0.01
function	16.5 (8.6)	15.6 (7.9)	14.9 (7.9)	19.3 (7.6)	<0.01

AUSCAN = Australian Canadian Osteoarthritis Hand Index,

1st CMCJ = first carpometacarpal joint,

DIPJ = distal interphalangeal joint,

PIPJ = proximal interphalangeal joint,

One-way ANOVA was used for the comparison of AUSCAN scores between patients with 1st CMCJ complaints only, DIPJ and PIPJ complaints only and combined 1st CMCJ with DIPJ/PIPJ complaints in hand OA patients.

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