Functional Health Assessment Questionnaire (HAQ) and Psychological HAQ Are Associated with and Predicted by Different Factors in Rheumatoid Arthritis

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ABSTRACT. ***Objective.*** To evaluate the association between clinical, demographic, and psychological factors and the functional Health Assessment Questionnaire (HAQ) and psychological HAQ (PSHAQ) in patients with rheumatoid arthritis (RA).

Methods. After a mean followup time of 7 years after diagnosis, 112 patients with RA were asked to fill out the HAQ and the PSHAQ. Several clinical variables [erythrocyte sedimentation rate (ESR), visual analog scale (VAS) pain, VAS general well-being, Thompson joint score, and morning stiffness] had been assessed at diagnosis and at followup. In addition, the Impact of Rheumatic diseases on General health and Lifestyle questionnaire, comprising different domains of psychological distress, was assessed at diagnosis. Spearman correlations were calculated to determine associations between functional HAQ and clinical and psychological variables at baseline and to determine the associations between clinical variables and the HAQ and PSHAQ score at followup. Univariate logistic regression analyses were performed to identify possible predictors at diagnosis for a worse HAQ score and PSHAQ score (score > 1) at followup.

Results. At followup the functional HAQ score was associated with all clinical variables, whereas the PSHAQ was only associated with more subjective patient related variables (VAS pain, VAS general well-being, and morning stiffness). The final model of the multivariate regression analyses to predict a worse HAQ score at followup only included worse functional ability [odds ratio (OR) 2.63, 95% confidence interval (CI) 1.30–5.32, p = 0.007]. Anxiety (OR 1.13, 95% CI 1.03–1.24, p = 0.007) and a lower ESR value (OR 0.98, 95% CI 0.96–1.00, p = 0.05) assessed at diagnosis were included into the final model as predictors for a high PSHAQ score.

Conclusion. Overall, the HAQ score, reflecting limitations of daily functioning, is a good representation of disease activity at diagnosis and after a mean disease duration of 7 years, whereas PSHAQ is not. (First Release August 1 2007; J Rheumatol 2007;34:1837–40)

Key Indexing Terms:
FUNCTIONAL HEALTH ASSESSMENT QUESTIONNAIRE RHEUMATOID ARTHRITIS
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Functional disability is one of the outcome measures often assessed in rheumatoid arthritis (RA) populations. In general, studies investigating the relation between functional disability and other factors of disease activity either reported the results of cross-sectional analyses or of prognostic analyses[1-4], but the results of both analyses were reported in one study[5]. The Health Assessment Questionnaire (HAQ)[6] is most often used to assess functional disability, reflecting difficulties in activities of daily living (ADL). To evaluate psychological distress in RA, the psychological HAQ (PSHAQ)[7] has been developed.

We evaluated the associations between and the predictive ability of clinical, demographic, functional, and psychological factors assessed at disease onset and the HAQ and PSHAQ scores at followup.

MATERIALS AND METHODS

In our study, patients had been included in one of 2 inception cohorts investigated by the Utrecht Rheumatoid Arthritis Cohort study group. In the first inception cohort, patients with early RA were randomized into one of 2 strategy groups: an early start with disease modifying antirheumatic drugs (DMARD) group versus a delayed start with DMARD group[8]. In the second, consecutively executed inception cohort, patients were randomized into 2 treatment strategy groups: an intensive strategy group or a conventional strat-

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egy group with methotrexate (MTX)[9]. For both inception cohorts, the clinical trial lasted 2 years. Variables were assessed at diagnosis and annually thereafter.

At diagnosis. Erythrocyte sedimentation rate (ESR; mm/h), morning stiffness (0–180 min), visual analog scale (VAS) for pain (a mean score of VAS pain at night and VAS pain in the morning; 0–100 mm = worst pain), VAS general well-being (0–100 mm = worst well-being), and Thompson joint score (a weighted score of both tender and swollen joints; total score 0–534)[10]. Patients also filled out the questionnaire on the Impact of Rheumatic diseases on General health and Lifestyle (IRGL)[11], comprising domains on psychological well-being (i.e., depressive mood, cheerful mood, and anxiety) and self-care. A higher score indicates a higher rating of that specific domain. Functional disability was assessed by means of the Dutch Health Assessment Questionnaire (VDF)[12] derived from the original HAQ[13].

At followup. A questionnaire was sent to 112 patients participating in one of the 2 inception cohorts including the HAQ, the PSHAQ, a VAS pain (mean pain over past week; 0–100 mm = worst score), and a VAS well-being (0–100 mm = worst score). The PSHAQ includes the items "good night's sleep," "dealing with feelings of anxiety or being nervous," and "dealing with feelings of depression or feeling blue." The final score for both HAQ and PSHAQ ranges from 0 to 3 = worst score. At the same time the physician evaluated disease activity including the Thompson joint score, ESR, and VAS disease activity according to the physician.

Statistical analyses. Although the HAQ and the questions regarding VAS pain and VAS general well-being assessed at diagnosis and at followup were slightly different, these variables were defined as one and the same variable in all analyses. Spearman correlation coefficients were calculated to determine the association between: (1) HAQ score at diagnosis and the clinical variables, age, and the psychological domains of the IRGL questionnaire assessed at diagnosis; and (2) the association between the HAQ score and the PSHAQ score assessed at followup with the clinical variables and age at followup.

Univariate and multivariate logistic regression analyses, with HAQ and PSHAQ as dependent variables (cutoff point ≥ 1, i.e., limitations of functional or psychological status[6]), were then performed to determine the predictive ability of disease and patient related characteristics assessed at diagnosis. First, all clinical variables, age at diagnosis, sex, HAQ, and the different domains of the IRGL questionnaire were entered as independent variables in the univariate analyses. In addition, all independent variables were then entered in order of p value obtained in the univariate regression analyses into a multivariate logistic regression model (forward selection procedure). In all logistic regression analyses, disease duration (natural log-transformed) was entered as covariate since disease duration differed between patients.

RESULTS

Patient characteristics at diagnosis and at followup are shown in Table 1. Forty-seven (42%) patients had been participants of the first inception cohort and 65 (58%) of the second inception cohort. Except for Thompson joint score, disease activity and psychological status were similar between the 2 inception cohorts at diagnosis.

Correlations. At diagnosis, worse functional ability was statistically significantly correlated with all clinical variables and more anxiety and less cheerful mood, but not with depressed mood (Table 2). Age was not associated with functional disability and there was no difference in median HAQ score between male and female patients (1.00 vs 1.13; p = 0.48, Mann-Whitney U-test).

At followup, next to all clinical variables, a higher HAQ score was also associated with higher age. Although there was a difference in median HAQ score between male and female patients (0.25 vs 0.75), this was not statistically significant (p = 0.12). PSHAQ was only statistically significantly associated with VAS pain, VAS general well-being, and morning stiffness. In addition, female patients had a higher median PSHAQ score than male patients (0.33 vs 0.67; p = 0.021).

Table 1. Patient characteristics at diagnosis and at followup.

	Diagnosis	Followup
Sex, female	76 (68)	
Age, yrs	49.0 ± 12.4	56.5 ± 12.5
Disease duration, yrs		7.1 ± 3.4
ESR	40.0 ± 26.3	20.7 ± 18.3
Thompson joint score	126.4 ± 100.5	33.0 ± 61.1
VAS pain	47.6 ± 25.4	24.8 ± 21.4
VAS general well-being	51.2 ± 22.2	27.9 ± 21.1
Morning stiffness	86.5 ± 55.8	21.4 ± 34.5
HAQ	1.07 ± 0.65	0.69 ± 0.61
PSHAQ		0.57 ± 0.54
IRGL		
Self-care	23.9 ± 5.1	
Depressed mood	4.7 ± 3.4	
Cheerful mood	10.2 ± 4.0	
Anxiety	20.0 ± 5.0	
DMARD use		
No DMARD	2 (1.8)	14 (12.5)
Methotrexate	83 (74.1)	64 (57.1)
Hydroxychloroquine	17 (15.2)	4 (3.6)
Intramuscular gold injections	10 (8.9)	1 (0.9)
Sulfasalazine		4 (3.6)
Azathioprine		1 (0.9)
Leflunomide		2 (1.8)
Etanercept		3 (2.7)
Infliximab		1 (0.9)
Adalimumab		7 (6.3)
Combination of DMARD		11 (9.8)

Scores are mean ± SD for continuous variables and number (%) for categorical data. Ranges are as follows: erythrocyte sedimentation rate (ESR 0–140 mm/h), Thompson joint score (0–534), all visual analog scale (VAS; 0–100 = worst score), morning stiffness (0–180 minutes), Health Assessment Questionnaire (HAQ) and psychological HAQ (PSHAQ) (0–3 = worst score). Ranges for scales of the Impact of Rheumatic diseases on General health and Lifestyle (IRGL) questionnaire are as follows: self-care (8–32 = more self-care), depressed mood (0–24 = more depressed mood), cheerful mood (0–24 = more cheerful mood), and anxiety (10–40 = more anxiety). DMARD: disease modifying antirheumatic drugs.

Prognostic factors. The results of the univariate regression analyses (Table 3) showed that worse functional ability, longer duration of morning stiffness, higher age, and less self-care at diagnosis were statistically significant predictors for having functional limitations later on in the disease. The final model of the multivariate regression analyses model included only worse functional ability (OR 2.63, 95% CI 1.30–5.32, p = 0.007).

A high PSHAQ score at followup was predicted by more anxiety measured at diagnosis in the univariate regression analyses (Table 3). Next to anxiety (OR 1.13, 95% CI 1.03–1.24, p = 0.007), a lower ESR value (OR 0.98, 95% CI

Table 2. Spearman correlations between clinical and demographic variables and HAQ (at diagnosis and followup) and PSHAQ at followup.

	HAQ at Diagnosis		HAQ at Followup		PSHAQ at Followup	
	r	p	r	p	r	p
Age	0.15	0.111	0.24	0.012	0.16	0.092
Morning stiffness	0.22	0.023	0.44	0.000	0.25	0.007
VAS general well-being	0.28	0.003	0.61	0.000	0.46	0.000
VAS pain	0.44	0.000	0.71	0.000	0.36	0.000
ESR	0.36	0.000	0.19	0.045	–0.04	0.702
Thompson joint score	0.31	0.001	0.27	0.004	0.18	0.065
IRGL						
Self-care	–0.51	0.000	NA	NA	NA	NA
Depressed mood	0.18	0.064	NA	NA	NA	NA
Cheerful mood	–0.22	0.023	NA	NA	NA	NA
Anxiety	0.25	0.007	NA	NA	NA	NA

For abbreviations, see Table 1. NA: not applicable.

Table 3. Potential demographic, clinical, and psychological prognostic factors assessed at diagnosis in patients with limitations in functional ability and psychological distress at followup.

	HAQ			PSHAQ		
	OR	95% CI	p	OR	95% CI	p
Age	1.047	1.009–1.086	0.016	1.009	0.976–1.043	0.610
Sex, women vs men	0.901	0.374–2.173	0.816	2.144	0.827–5.558	0.117
VAS general well-being	1.012	0.993–1.032	0.228	1.004	0.986–1.023	0.650
VAS pain	1.016	0.999–1.033	0.070	1.005	0.989–1.021	0.535
ESR	1.004	0.988–1.016	0.651	0.986	0.968–1.003	0.113
VDF	2.631	1.301–5.321	0.007	0.874	0.458–1.668	0.682
Morning stiffness	1.008	1.001–1.016	0.035	1.001	0.994–1.008	0.797
Thompson joint score	1.003	0.999–1.007	0.124	1.000	0.995–1.004	0.838
IRGL						
Self-care	0.897	0.823–0.977	0.013	1.036	0.953–1.126	0.409
Depressed mood	1.050	0.931–1.184	0.428	1.027	0.912–1.156	0.660
Cheerful mood	0.996	0.898–1.106	0.947	0.914	0.818–1.022	0.116
Anxiety	1.018	0.937–1.105	0.678	1.113	1.021–1.213	0.015

OR obtained from univariate logistic regression analyses. 95% CI (exp(B) = 95% confidence interval of coefficient [exp(B)]. A cutoff score of ≥ 1 was used to categorize patients into 2 groups: patients with limitations vs patients without limitations in functional ability and patients with psychological distress vs patients without psychological distress. In this study 32 patients (29%) had a HAQ score ≥ 1 and 33 (30%) patients had a PSHAQ score ≥ 1. VDF: Dutch HAQ.

0.96–1.00, p = 0.05) assessed at diagnosis was included into the final model of the multivariate regression analyses as a predictor for a high PSHAQ score.

DISCUSSION

We evaluated cross-sectionally as well as longitudinally the association between several RA related variables and functional disability at diagnosis and at followup. Both at diagnosis and at followup, functional disability was associated with all clinical variables. However, in the univariate regression analyses none of the psychological domains was predictive for functional disability later on in the disease.

Another purpose of our study was to examine associations between and predictors of several variables with PSHAQ score at followup. At followup, the PSHAQ score was especially, but weakly, associated with subjective patient related variables of disease activity rather than with objective variables of disease activity. No clinical variable was found to be predictive for PSHAQ. However, more anxiety at diagnosis was found to be a strong predictor of worse PSHAQ. Our results are confirmed by another study[5].

One drawback of our study was that the HAQ[13] and the formulation used to determine magnitude of pain and of general well-being were slightly different between baseline and followup. Unfortunately, we did not assess factors such as social support and coping, which have more often been found to be related with psychological distress[14,15].

Overall, the HAQ score, reflecting limitations of daily

functioning, is a good representation of disease activity at diagnosis and after a mean disease duration of 7 years, whereas PSHAQ is not.

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