Sources of Discrepancy in Patient and Physician Global Assessments of Rheumatoid Arthritis Disease Activity

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ABSTRACT. ***Objective.*** To investigate discrepancy in the perception of rheumatoid arthritis (RA) disease activity between patient and physician, and its possible sources.

Methods. Eighty patients with RA rated their level of disease activity on a visual analog scale (VAS). Physician global assessment (MDGA) of disease activity was performed blinded to the patient evaluation except for the results of laboratory tests. A discrepancy score (DS) was calculated by subtracting MDGA from patient global assessment (PTGA), leading to definition of 3 groups of patients: (1) no discrepancy when PTGA and MDGA were within 1.0 or 3.0 cm of each other; (2) negative discrepancy when PTGA was under-rated relative to the physician; and (3) positive discrepancy when PTGA was over-rated relative to the physician. Age, sex, disease duration, education, income, residence area, employment, use of antirheumatic drugs, comorbidity, pain score, Health Assessment Questionnaire (HAQ) rating, tender (TJC) and swollen (SJC) joint count, and Disease Activity Score (DAS28) were recorded.

Results. Negative discrepancy was found in 27.5% (VAS 1 cm) and 8.7% (VAS 3 cm) of patients, positive discrepancy in 43.7% (VAS 1 cm) and 23.7% (VAS 3 cm), and no discrepancy in 28.7% (VAS 1 cm) and 67.5% (VAS 3 cm). Patients were predominantly older (mean age near 50 yrs), female, with long disease duration and low income. The negative discrepancy group had a lower level of education and higher C-reactive protein ($p < 0.05$). The positive discrepancy group presented a higher pain score, HAQ score, and TJC ($p < 0.0001$). The no-discrepancy group had lower SJC ($p < 0.05$).

Conclusion. Our results indicate that for disease activity in patients with RA assessed on pain score, HAQ, and TJC, the only important feature that determined perception of their RA disease activity was education. (J Rheumatol 2004;31:1293–6)

Key Indexing Terms:
RHEUMATOID ARTHRITIS
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Clinical evaluation of disease activity in patients with rheumatoid arthritis (RA) is commonly based on a set of indicators. Ideally, the measures chosen for use should be sensible, reliable, accurate, sensitive to change over time, not redundant, and comprehensive[1]. The set of parameters for assessment of disease activity in patients with RA that are considered the most useful and accurate in assessing changes in clinical status and therefore the most used in therapeutic trials are the American College of Rheumatology preliminary definition of improvement in RA (ACR-20)[2], the World Health Organization and International League of Associations for Rheumatology core endpoints for symptom modifying antirheumatic drugs in RA clinical trials[3], and the Disease Activity Score of 28 tender and swollen joints (DAS28)[4]. All include as parameters of evaluation the physician and patient global assessment of disease activity. Patient global assessment of disease activity means the patient's overall assessment of how the arthritis is doing, and physician global assessment of disease activity is the same assessment by a physician of the patient's current disease activity[2].

The patient's perception of disease activity probably determines the ability of patients to cope with disease as well as treatment compliance[5]. The physician's perception of disease is supposed to influence clinical decisions in regard to the need for clinical and laboratory evaluation as well as therapeutic options. Study of 14 clinical measures showed that physician global assessment, a functional status questionnaire, and the patient global assessment or pain score should be the principal measures used to assess arthritis activity in patients with RA[1]. Physician global

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assessment of disease activity was the most accurate and sensitive measure of those evaluated by the physician[1]. Similarity was found between patient assessment of disease activity and pain score. Patient assessment of disease activity was also the patient measure that correlated most highly with the most accurate physician-determined measure, the physician assessment of disease activity[1].

The inclusion of both physician and patient global assessment as parameters of clinical evaluation of disease activity in RA could be viewed as redundancy or duplication. However, there are substantial data indicating that patient and physician differently quantify and evaluate health status[6-15]. Many factors may cause patient perception of disease activity to either coincide with or diverge from the perception of the treating physician[16]. Thus studies have investigated difference in perception of disease activity by patient and physician and the reasons for this difference, with the aim of minimizing its impact on the disease course and outcome[16]. Studies of discrepancy in perception of disease activity between patient and physician have been carried out in patients with systemic lupus erythematosus (SLE); these studies showed discrepancy between patient and physician evaluations of disease activity in SLE[16-19]. We investigated the possible discrepancy between patient and physician in the perception of disease activity in RA as well as its possible sources.

MATERIALS AND METHODS

Study population. Data were obtained from 80 patients with RA fulfilling the American Rheumatism Association 1987 revised criteria[20]. All participants were recruited from the outpatient clinic of the Rheumatology Division, Sorocaba Hospital, at the Catholic University of São Paulo. Patients were in regular followup and gave informed consent to participate.

Discrepancy score. Patients rated their level of disease activity on a 10 cm anchored visual analog scale (VAS) where 0 was considered the worst disease activity (doing very poor) and 10 the best disease activity (doing very well). Patients were asked "considering all the ways your joint disease affects you, mark an 'X' through the line for how well you are doing". The physician global assessment of disease activity was performed by the same physician (GSN) on a separate VAS, only after completing the patient clinical and laboratory evaluation, and blinded to other parameters of patient evaluation except the laboratory results.

A discrepancy score (DS) was calculated by subtracting physician global assessment of disease activity from patient global assessment of disease activity[16,18]. Then patients were separated into one of 3 categories: (1) No discrepancy when patient and physician assessments of disease activity were within 1.0 or 3.0 cm from each other; (2) Negative discrepancy (ND) when patient assessment was under-rated relative to physician assessment; and (3) Positive discrepancy (PD) when patient assessment was over-rated relative to physician assessment. In summary, a PD indicates the patient perceives greater disease activity than the physician, and a ND indicates the physician perceives greater disease activity than the patient[16,18].

Socioeconomic-demographic and clinical variables. Patient data were obtained at study visit for the following: age, sex, disease duration (yrs), education (yrs), level of education (illiterate, elementary school, high school/college), monthly income expressed by the number of months of minimum wage defined by law for employees, residence area (rural or urban), employed or unemployed, use of antirheumatic drugs, and comorbidity. Laboratory evaluations including complete blood count (CBC), latex fixation test for rheumatoid factor (RF; normal < 20 IU), erythrocyte sedimentation rate (ESR, mm/h), and C-reactive protein (CRP; normal < 6 mg/dl) were available at study interview for physician analysis (GSN). During this interview, pain by VAS score, a Portuguese version of the Health Assessment Questionnaire (HAQ)[21], and the DAS28 were also evaluated[4,22].

Statistical analyses. The first step of analysis studied the frequency of distribution of the variables. Then the association between the qualitative variables and discrepancy was examined by chi-square or Fisher's exact test (if expected value in a cell was < 5), and the differences in the means revealed by the quantitative variables between the discrepancy categories by Kruskal-Wallis or ANOVA (if the variances were homogeneous and data normally distributed). The significance level was considered 0.05.

RESULTS

Discrepancy in the perception of disease activity, either negative or positive, was observed in 57 patients (71.2%, VAS 1 cm) and 26 patients (36.5%, VAS 3 cm). Negative discrepancy (the patient scored lower than the physician) was found in 22 patients (27.5%, VAS 1 cm) and 7 patients (8.7%, VAS 3 cm); and positive discrepancy (patient scored higher than physician) was found in 35 patients (43.7%, VAS 1 cm) and 19 patients (23.7%, VAS 3 cm). No discrepancy in perception of disease activity between patient and physician was found in 23 (28.7%, VAS 1 cm) patients and 54 patients (67.5%, VAS 3 cm).

Table 1 shows the analysis of socioeconomic-demographic and clinical features and discrepancy scores. In general, patients were near 50 years of age, predominantly female, with long disease duration and low income. Patients with fewer years of education and lower levels of education rated their disease activity as lower compared with patients with more years and high level of education. Therefore, the negative discrepancy group presented lower education ($p < 0.05$).

There was no association between discrepancy scores and residence area, employment, income categories, antirheumatic drugs used, or comorbidity. Comorbidity presented a tendency to be associated with the positive discrepancy group ($p = 0.07$). Table 2 depicts the analysis of RA activity indicators and discrepancy groups. Measures generally ascribed to patient assessment like the pain score and HAQ score were significantly higher in the positive discrepancy group. On the other hand the set of measures related to physician assessment, such as ESR, CRP, and number of tender and swollen joints, showed a disparity in their association with the discrepancy scores. In regard to the measures of systemic inflammation, CRP was higher in the ND group (VAS 1 cm; $p < 0.05$) and a tendency of the ESR to be higher in the ND group was also observed. When the VAS-3 cm value was applied, no difference was found between ESR and CRP and the discrepancy scores. CBC and RF were also not related to any discrepancy score. The number of tender joints was higher in the PD group ($p < 0.0001$) and the number of swollen joints was lower in the

Table 1. Patients' socioeconomic-demographic and clinical features and discrepancy scores (VAS 1 cm and 3 cm).

	No Discrepancy		Negative Discrepancy		Positive Discrepancy	
	1 cm (n = 23)	3 cm (n = 54)	1 cm (n = 22)	3 cm (n = 7)	1 cm (n = 35)	3 cm (n = 19)
Age, yrs ± SD	49.7 ± 11.7	49.5 ± 12.0	49.6 ± 12.5	49.2 ± 10.1	50.0 ± 11.5	50.6 ± 12.1
Sex, % women	78.2	85.2	86.3	100.0	91.4	89.5
Disease duration, yrs ± SD	9.95 ± 7.47	10.86 ± 8.66	13.27 ± 7.47	14.28 ± 7.36	10.57 ± 10.68	10.73 ± 10.67
Education, yrs ± SD	4.39 ± 2.87	4.53 ± 3.05	2.77 ± 5.23*	1.85 ± 2.54*	4.74 ± 3.28	3.68 ± 2.68
Level of education, %						
Illiterate	0	3.7	22.7*	42.9*	8.6	15.8
Elementary school	82.6	83.3	77.3	57.1	77.1	73.7
High school/college	17.4	13	0	0	14.3	10.5
Month minimum wage, number ± SD	2.53 ± 1.58	2.66 ± 1.99	2.04 ± 0.87	1.92 ± 1.17	2.60 ± 2.29	1.94 ± 1.24
Number of month minimum wage, % of patients						
< 1	4.3	3.7	0	0	8.6	10.5
1–1.99	26.2	24.0	36.4	57.1	31.4	42.1
2–4.99	56.5	63	63.6	42.9	54.3	47.4
≥ 5	13	9.3	0	0	5.7	0

Values are expressed as mean ± SD. * $p < 0.05$.

Table 2. Analysis of RA activity indicators and discrepancy scores (VAS 1 cm and 3 cm).

	No Discrepancy		Negative Discrepancy		Positive Discrepancy	
	1 cm (n = 23)	3 cm (n = 54)	1 cm (n = 22)	3 cm (n = 7)	1 cm (n = 35)	3 cm (n = 19)
Pain, VAS score, ± SD	3.45 ± 2.34	4.10 ± 2.85	2.58 ± 2.42	2.28 ± 1.75	6.65 ± 2.72***	7.17 ± 2.72***
HAQ score, ± SD	0.82 ± 0.72	1.18 ± 0.78	1.42 ± 0.77	1.68 ± 0.84	1.74 ± 0.74**	1.89 ± 0.66**
ESR, mm/h, ± SD	34.26 ± 19.02	38.69 ± 22.72	50.19 ± 32.92	54.00 ± 40.63	35.74 ± 21.94	34.97 ± 24.98
CRP, mg/dl, ± SD	21.63 ± 43.31	26.90 ± 63.04	74.26 ± 12.96*	76.83 ± 15.48	9.35 ± 7.45	9.73 ± 8.09
No. of tender joints, ± SD	3.20 ± 4.68	4.66 ± 6.22	4.95 ± 7.14	7.14 ± 8.29	11.60 ± 9.50***	15.31 ± 9.74***
No. of swollen joints, ± SD	2.83 ± 4.42*	4.51 ± 5.25*	6.86 ± 6.92	7.57 ± 7.23	7.25 ± 7.87	9.26 ± 9.77
DAS 28 score, ± SD	2.99 ± 1.37	3.40 ± 1.70	4.27 ± 2.55	4.81 ± 3.19	3.74 ± 1.74	3.90 ± 1.93

Values are expressed as mean ± SD. * $p < 0.05$; ** $p < 0.001$; *** $p < 0.0001$.

no-discrepancy group ($p < 0.05$). DAS28 was not related to any discrepancy score.

In summary, joint involvement and worsening in self-perceived measures were related to the positive discrepancy group (patient over-rated physician) and abnormal laboratory findings were related to the negative discrepancy group (physician over-rated patient).

DISCUSSION

In this study of discrepancy between patient and physician assessment of disease activity in RA we registered the global assessment of disease activity and compared this measure with sociodemographic, clinical, and laboratory measures such as pain score, HAQ score, ESR, CRP, number of tender and swollen joints, and DAS28. We found evidence for difference in patient and physician assessment of RA disease activity in 71.2% and 36.5% of assessments if we consider as clinically relevant a discrepancy on VAS greater than 1 or 3 cm, respectively. Discrepancy occurred more in the positive direction (43.7%, VAS 1 cm; 23.7%, VAS 3 cm) than in the negative direction (27.5%, VAS 1 cm; 8.7%, VAS 3 cm). No discrepancy occurred in 28.7% (VAS 1 cm) and 67.5% (VAS 3 cm) of assessments. We found that most patients (43.7%, VAS 1 cm; 23.7%, VAS 3 cm) evaluated their global assessment of RA disease activity higher than the physicians. However, in one previous study, patient global assessment showed the highest correlation with the physician global assessment[1]. In another study, younger patients with RA assessed their disease as worse than patients with other diseases[15]. It has been suggested that physician global assessments were similar to the patient global assessments and provided redundant information[23]. Our data support that patients and physicians rate RA disease activity differently. Rather than suggesting that either the patient or the physician assessment of disease activity is not valid or redundant, we believe that patients

and physicians perceive disease activity differently, for many reasons. As described by Alarcón, *et al*[16], reporting sources of discrepancy in the perception of disease activity in patients with SLE, patients appear to weigh disease activity by considering subjective manifestations or poor self-perceived function as more relevant, compared with physician assessments. Our results also point to this direction, because our RA patients indicated PD (rated more disease activity than physician) when they had higher pain and HAQ scores as well as increased number of tender joints. Otherwise, the patients had ND (scored their disease activity lower than physician) when they had less education. This finding suggests that education may be a significant factor associated with perception of disease activity by the patient with RA. This could be important, considering that the literature describes higher risk of RA associated with lower levels of education[24,25].

Physicians seem to weigh more objective findings, particularly abnormal laboratory results (ESR, CRP) as well as swollen joints, when they are scoring global assessment of disease activity in RA. As observed in patients with SLE[16,19], our data for perception of disease activity in patients with RA also show that laboratory findings influence physician perception of disease activity. Further studies are needed to confirm our findings and improve the comprehension of global assessment of RA disease activity. In summary, our results indicate that patients with RA assessed disease activity based on self-perceived function measured by pain score, Health Assessment Questionnaire, and number of tender joints, but one important feature that determined the perception of their RA disease activity was education.

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