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Longitudinal Occurrence and Predictors of Patient-Provider Discordance Between Global Assessments of Disease Activity in Rheumatoid Arthritis: A Case-Control Study

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Abstract

Objective: The objective was to identify longitudinal predictors of discordance between patients with rheumatoid arthritis (RA) and their health care providers, where patient global assessment of disease activity is substantially higher than provider global assessment.

Methods: This retrospective case-control study included 102 cases with positive discordance (ie, 25 mm between patient and provider global assessments) and 102 controls without discordance who were matched for age, sex, RA duration, and Clinical Disease Activity Index (CDAI). Data were collected at the baseline visit (date of diagnosis or earliest available visit), the index visit (participation in a previous cross-sectional study), and at up to 11 additional visits before the index visit. Data included patient characteristics, disease activity measures, disease activity score in 28 joints for C-reactive protein with the 3-variable version (DAS28-CRP[3]), and medications. Data were analyzed by using linear and logistic regression models with smoothing splines for nonlinear trends.

Results: Overall, the mean age was 63 years, 75% were female, and mean RA duration was 10 years. Compared with controls, cases had higher rates of discordant visits during the 4 years before the index visit, and they had higher CDAI and DAS28-CRP(3) earlier in the disease course. Cases more frequently had antinuclear antibodies, nonerosive disease, prior depression, or prior use of antidepressants or fibromyalgia medications. Disease-modifying medication use was not different between cases and controls.

Conclusion: The findings inform new hypotheses about the relationships of disease activity and antinuclear antibodies to the later occurrence of positive discordance among patients with RA.

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Keywords

global assessment of disease activity; patient-provider discordance; predictors of discordance; rheumatoid arthritis; treat-to-target strategy

Introduction

Discrepancy in assessments of health status is quite common between patients with rheumatic diseases and their health care providers (1). Among patients with rheumatoid arthritis (RA), discordance between patients and their providers in the global assessment of disease activity, in which the patient's global assessment is substantially higher (ie, 25 points on a scale from 0–100) than the provider's global assessment, is present in approximately 30% of clinical encounters (2–5). Although management of RA has changed dramatically over the past decades, patient-provider discordance is clearly prevalent. The treat-to-target and tight control strategies have become important in the management of RA (6, 7). However, current treatment guidelines do not provide specific guidance for addressing patient-provider discordance in relation to diagnosis, treatment, or medical decision making. Limited evidence to date suggests that positive discordance is predictive of adverse health-related quality of life, loss of work productivity, and activity impairment at 36 weeks of follow-up (8) and at 2 years of follow-up (9). Addressing these issues in a comprehensive manner should be a major goal of providers for improving patient outcomes and health-related quality of life (8, 9).

Little is known about the occurrence of patient-provider discordance. Although many cross-sectional studies have reported the prevalence of discordance among patients with RA (2, 3, 10–13), few studies have investigated how frequently discordance occurs during the disease course and whether discordance persists or resolves after it has occurred (8, 9, 14). Previous studies have identified numerous potential causes, especially pain due to inflammatory and noninflammatory processes, fatigue, functional disability, depression, psychologic distress, low health literacy, and problems with patient-provider communication (2, 3, 8, 10). However, few longitudinal studies have identified predictors of future patient-provider discordance (8, 9, 14). Knowledge of the predictors of discordance is critical to the design and development of strategies for identification and management to lessen or prevent the occurrence of discordance. Hence, the objectives of our study were to determine the persistence of discordance over time, to identify predictors of future discordance, and to evaluate the impact of discordance on RA treatment decisions.

Patients and Methods

Study Design and Patient Population

This was a retrospective case-control study of 204 patients classified as having RA identified from our previous cross-sectional study (13) of 350 consecutive patients with a clinical diagnosis of RA or inflammatory arthritis who were evaluated at Mayo Clinic in Rochester, Minnesota, between September 2014 and May 2015 (Figure 1). All the study patients fulfilled the 2010 American College of Rheumatology (ACR)/European League Against

Rheumatism (EULAR) classification criteria for RA (15), were 18 years or older, and resided within 250 km of Mayo Clinic in Rochester, Minnesota. The *index visit* was defined as the visit from our previous cross-sectional study on discordance. *Cases* were defined as having positive discordance (ie, patient global assessment of disease activity ≥ 25 mm more than the rheumatology care provider global assessment) at the index visit, and *controls* were defined as having concordance (ie, the difference between the patient and provider global assessments was <25 mm) at the index visit. For each of the 102 cases, 1 control was matched for age (± 5 years; median, 1.6 years between matched pairs), sex, RA duration (± 10 years; median, 2.2 years between matched pairs), and Clinical Disease Activity Index (CDAI) score (<10 vs ≥ 10) (5). In our practice, patients generally return to see the same provider for follow-up visits. The Mayo Clinic Institutional Review Board approved the study and granted a waiver for informed consent. Before abstracting records, we verified that no participants denied use of their medical records for research, according to Minnesota law.

Data Collection

Data were collected from the electronic health records at the *baseline visit* (defined as the date of diagnosis or earliest available visit when both patient and provider global assessments were available), the index visit, and up to 11 additional clinical visits before the index visit over the previous 3 to 4 years (Figure 1). At the baseline visit, study variables included duration of symptoms; date of diagnosis; radiographic evidence of erosions; first conventional synthetic or biologic disease-modifying antirheumatic drug (DMARD) used; results of testing for rheumatoid factor, anti-cyclic citrullinated peptide (CCP) antibodies, or antinuclear antibodies (ANAs); and use of prednisone, opioids, or antidepressants. Use of methotrexate in the first 6 months after diagnosis was also determined.

Data from each clinical visit included the patient and provider global assessments with the visual analog scale (VAS) (scored 0–100 mm); pain VAS (scored 0–100 mm); tender and swollen joint counts (scored 0–28); Health Assessment Questionnaire II (HAQ-II) (16); CDAI (17); disease activity score in 28 joints for C-reactive protein (CRP) with the 3-variable version (DAS28-CRP[3]) (18, 19); radiographic evidence of erosions; erythrocyte sedimentation rate (ESR); and CRP. Differences between patient and provider global assessments were calculated for each visit, and a *discordant visit* was defined as any visit with a difference of ≥ 25 mm or more. Recorded data also included information on the initiation or modification of treatment with conventional synthetic or biologic DMARDs or glucocorticoids and with opioids, fibromyalgia medications (eg, duloxetine, pregabalin, and milnacipran), antidepressants, or anxiolytics. For each visit, the presence of comorbidities was also abstracted; these included depression, anxiety, fibromyalgia, and osteoarthritis and were defined by any history of physician diagnosis.

Statistical Analysis

Descriptive statistics (eg, means and percentages) were used to summarize the data for cases and controls. Comparisons between groups were performed with the χ^2 and Wilcoxon rank sum tests, and conditional logistic regression models were adjusted for time from the baseline visit to the study visit. Trends over time in characteristics of interest were examined by using generalized linear models with random effects to account for multiple visits per

patient. Interactions were examined between case and control status and rates of change in patient characteristics. Smoothing splines were used to examine potential nonlinear trends and to plot the trends over time. Analyses were performed with SAS version 9.4 (SAS Institute Inc) and R 3.1.1 (R Foundation for Statistical Computing).

Results

Patient Characteristics at the Index Discordant Visit

The study cohort included 102 cases and 102 controls (Table 1). The majority of patients in both groups were non-Hispanic white, and 75% were female. At the index visit, the mean age was 63 years, the mean RA duration was 10 years, the mean CDAI was 12 for both cases and controls ($P=.15$), and the mean DAS28-CRP(3) was 3.0 for cases and 2.9 for controls ($P=.99$). The mean (SD) patient global assessment was 59 (16.0) for cases and 31 (24.3) for controls ($P<.001$).

Associations of Discordance With Baseline Disease Characteristics

The mean (SD) number of visits was similar between cases (6.3 [2.9]) and controls (5.9 [2.7]) ($P=.33$). For both groups, the mean (SD) time between baseline and index visits was 2.6 (1.2) years (median, 3.0 years; maximum, 4.0 years).

At baseline, the mean (SD) patient global assessment was 42 (24.0) mm for cases and 25 (22.7) mm for controls ($P<.001$). The mean (SD) CDAI was 15 (10.6) for cases and 11 (10.8) for controls ($P=.001$); similarly, the mean (SD) DAS28-CRP(3) was 3.5 (1.3) for cases and 2.8 (1.2) for controls ($P<.001$) (Table 1). According to both the CDAI and the DAS28-CRP(3) at baseline, a higher proportion of cases had moderate or high disease activity, whereas a higher proportion of controls was in the remission or low disease activity category; the proportion of patients in the remission or low disease activity category was similar between the cases and controls at the index visit.

At RA diagnosis, no significant differences were observed between cases and controls in the prevalence of comorbid osteoarthritis (32% vs 25%, respectively) or fibromyalgia (2% vs 4%, respectively). Pain levels were higher for cases compared with controls at baseline. At the index visit, 53% of controls and 62% of cases had a clinical diagnosis of osteoarthritis, and 10% of controls and 18% of cases had a clinical diagnosis of fibromyalgia (Table 2).

Trends in Patient-Provider Discordance Over Time

Analysis of the trends before the index discordant visit showed that the patient global assessment increased annually by an average of 2.4 mm among controls and 3.7 mm among cases; these values equate to 3-year changes of 7 mm among controls and 11 mm among cases (interaction $P=.26$), while the provider global assessment did not change for controls (average change, 0.3 mm over 3 years) and decreased by 11 mm over 3 years on average for cases (interaction $P=.008$) (Figure 2). Examination of the differences between the patient and provider global assessments over time showed that the patient global assessment was 20 mm more, on average, than the provider global assessment before the study visit, and this discordance increased over 3 years by 21 mm, on average, among the cases and by only 6

mm among controls (interaction $P=.001$). Analysis of trends for individual patient-provider dyads revealed evidence of variability, with some patients and providers alternating between discordance and concordance over time (data not shown). However, a greater percentage (70.7% vs 30.0%, $P<.001$) and higher rate of discordant visits (1.6 vs 0.6, $P<.001$) was observed for cases compared with controls, providing evidence of a tendency of positive discordance to recur or persist.

The mean CDAI was similar between cases and controls at the index visit because of matching, but at the baseline visit CDAI was higher among cases than controls (Figure 3). On average, over 3 years the CDAI increased by 2.4 units among controls and decreased by 2.4 units among cases (interaction $P=.004$). Pain VAS was consistently higher among cases compared with controls throughout the study period; on average, pain VAS increased by 6 mm among controls and 10 mm among cases over 3 years, but these increases were not significantly different from each other (interaction $P=.24$). The tender joint counts did not change over time among the controls but decreased significantly among the cases by 1.4 joints over 3 years (interaction $P=.04$), whereas CRP levels increased by 2.7 mg/L on average over 3 years among controls and did not change significantly among cases (interaction $P=.02$). No significant differences in mean levels or rates of change were noted between cases and controls for the swollen joint count or HAQ-II.

Predictors of Discordance

Baseline predictors of future discordance were the patient global assessment (odds ratio [OR], 1.41 per 10-unit increase; 95% CI, 1.20–1.64); pain VAS (OR, 1.26 per 10-unit increase; 95% CI, 1.11–1.44); and CDAI (OR, 1.72 per 12-unit increase; 95% CI, 1.04–2.85). ANA positivity was associated with higher odds of future occurrence of discordance (Table 2). Use of methotrexate during the first 6 months of diagnosis was also associated with higher odds of discordance. Previous use of antidepressants (OR, 2.87; 95% CI, 1.21–6.80) or fibromyalgia medications (OR, 3.20; 95% CI, 1.17–8.74) was significantly associated with discordance. Clinical diagnoses of fibromyalgia (OR, 2.14; 95% CI, 0.74–5.26) or depression (OR, 1.94; 95% CI, 1.02–3.71) were associated with discordance, while previous use of nonsteroidal anti-inflammatory drugs and initiation or modification of treatment with conventional or biologic DMARDs were not statistically significant. Radiographic evidence of erosions was associated with lower odds for the occurrence of discordance (OR, 0.43; 95% CI, 0.22–0.83).

Impact of Discordance on Treatment Decisions

No differences were identified between cases and controls, respectively, in the cumulative numbers of additions or modifications of the DMARD regimen (77% vs 75%) or in treatment with conventional or biologic DMARDs between cases with positive patient-provider discordance and controls (data not shown; all $P>.05$). Further analysis of treatment changes adjusted for disease activity level at the time of the decision did not reveal significant differences between cases and controls ($P=.66$).

Discussion

This study is the first to evaluate the evolution of discrepancy between patient and provider global assessments by using electronic health record data collected during routine patient care. The cases were patients with positive patient-provider discordance in our previous cross-sectional study; the controls, with patient global assessments that were concordant with the provider global assessments, were selected from the same study population. This innovative approach enabled us to identify predictors of future positive discordance according to data collected earlier in the disease course. The findings provide new information that illuminates several factors that may contribute to the development of patient-provider discordance.

First, the findings show how discordance between patients and their health care providers evolves during the disease course. The patients with positive discordance at the index visit tended to have persistently higher global assessments compared with the provider global assessment for 3 to 4 years before the index visit. Both the percentages and the rates of discordant visits were significantly higher for cases than for controls before the index visit. Analysis of the trends in discordance over time (Figure 2) suggested that the determinants of discordance were already present earlier in the disease course, although there is evidence of discordance accentuation in the 6 to 12 months before the index date.

Second, and of key importance, the results suggested that cases with discordance have higher clinical disease activity than controls during the 3 to 4 years before the index visit according to the CDAI and its individual components (Table 1 and Figure 3). Matching by CDAI category was done to minimize confounding by absolute composite disease activity states at the index visit. Considering the potential for circularity in the use of the baseline CDAI (which incorporates the patient and provider global assessments) to predict the patient-provider discordance at the index visit, we also analyzed data for the DAS28-CRP(3), which contains neither the patient global assessment nor the provider global assessment but does include the CRP result. The finding of a higher mean DAS28-CRP(3) and a higher proportion of patients with moderate or high disease activity at baseline (according to DAS28-CRP[3]) mirrored the findings for the CDAI. Higher disease activity translated into higher HAQ-II physical disability at the baseline visit. The CRP and ESR values at baseline were also higher numerically for cases than for controls, although the differences were not statistically significant. Overall, the patterns showed more inflammatory disease activity in cases than in controls preceding the development of patient-provider discordance, rather than higher CDAI scores due solely from the higher patient global assessment. The elevations of the disease activity measures for cases trended downward and matched the disease activity for the controls by 2 years after the baseline visit. In contrast, the pain and HAQ-II disability scores trended upward among cases with discordance during the time before the index visit. These findings suggest that gaps in the detection of disease activity and the treat-to-target strategy may in some way undergird the development of patient-provider discordance.

We can only speculate on possible explanations for these findings. Persistence of inflammatory disease activity that is either unrecognized by the provider or has responded

inadequately to DMARD therapy could contribute to structural joint damage, to secondary degenerative disease, or to the development of peripheral or central pain sensitization later in the disease course. Previous studies have clearly shown that pain is the most important correlate of positive discordance (5), and fibromyalgia has been shown to be an important correlate of discordance in this study population (13). Any of these outcomes could contribute to a scenario in which the patient's symptoms are not directly caused by inflammation and would be less likely to respond to treatment with DMARDs. Lack of improvement despite appropriate DMARD therapy could be expected to cause uncertainty in the clinician's mind and contribute to the provider global assessment being lower than the patient global assessment (20).

Third, the association between positive discordance and lack of radiographic evidence of joint erosions earlier in the disease course is an important finding because it suggests that factors associated with nonerosive disease contribute to the development of patient-provider discordance. The nature of these factors is unclear, but provider bias created by the awareness of nonerosive disease may be a factor. The presence of erosions has been previously defined by both the ACR and the EULAR as a feature that carries a poor prognosis (6, 7). This could be a contrast effect: The provider's knowledge of the absence of erosions creates a mind-set, or bias, that the patient has mild disease in contrast to other patients who have joint erosions and severe disease; hence, the provider is more likely to assess the disease activity as low despite the patient's view that the disease activity is high (ie, positive discordance).

Fourth, and unexpectedly, ANA positivity was a predictor of positive discordance in this study. It seems unlikely that this could be explained by misdiagnosis of RA in patients who truly have systemic lupus erythematosus or other connective tissue diseases. Among patients with RA, ANA positivity is associated with a unique genetic profile (21), and among healthy patients, the presence of ANA and other autoantibodies is associated with the interferon signature despite the absence of features of overt systemic lupus erythematosus (22). ANA positivity is predictive of an inadequate response to tumor necrosis factor inhibitor therapy among patients with RA (23, 24), and this treatment nonresponse may be mediated by increased interferon- β activity (25). These findings underscore the known heterogeneity in the pathophysiology of RA and the need to better stratify patients according to dominant immunologic mechanisms, which would facilitate precision medicine. Ultimately, improved tailoring of treatment to the underlying immunopathogenesis could lead to better health outcomes for patients.

Fifth, the present study highlights the impact of various comorbidities on the development of patient-provider discordance. Previous studies have shown that positive discordance is associated with concurrent and historical depression and fibromyalgia (2, 13, 26). The temporal course of these comorbidities is not clear from our findings. If future studies further tracked the evolution of these concomitant disorders, clinicians would better understand the pathogenesis and be able to devise preventive strategies.

Finally, the results of this study suggest that discordance does not affect the decision to modify DMARD therapy. Wolfe and Michaud (27) reported on another type of discordance

characterized by patients declining to receive intensified treatment with DMARDs in the face of active disease because of their fear of feeling worse or experiencing adverse effects. In the DUO (epidemiological study of treatment decision in rheumatoid arthritis: doctor-reported outcomes and patient-reported outcomes) study by Dougados and colleagues (28), DMARD intensification was predominantly based on patient factors. Patients with low to moderate disease activity reportedly often felt no need to change therapy unless they were considerably affected by their current disease state (29). The most likely explanation is that the patients' disease experiences are currently not well integrated into shared decision making about treatment options. Further work is necessary to integrate patient-reported outcomes into systems of rheumatologic care and medical decision making, particularly when positive discordance exists.

Potential limitations of the present study, which was performed at a single academic center, include its retrospective observational design, which precludes assessment of causation between the baseline factors and later discordance. Patients and providers inherently differ in how they assess the disease, representing a challenge to establishing concordant assessments of global disease activity. Although patients generally return to see the same provider in our practice, it is possible that patients occasionally were seen by different providers at follow-up, which could have confounded the analysis of the longitudinal changes in patient-provider discordance. CDAI and DAS28-CRP(3) data were missing at baseline for some patients, but it is reassuring that the degree of missing data was similar for cases and controls. Data from the time of RA diagnosis were not available for all patients, limiting our ability to make inferences about the development of discordance during the early stage of the disease. Although patient education, health literacy, socioeconomic status, provider characteristics, and patient-physician communication are all related to discordance, they were not assessed in this study. Finally, the racial and ethnic homogeneity of the study population may limit generalizability to more diverse populations.

In conclusion, the time course for the development of positive discordance indicates that some of the determinants of discordance are present earlier in the disease course. The findings provide evidence of practice gaps in the diagnosis and treat-to-target strategy of inflammatory disease activity (particularly among patients with nonerosive disease) and of comorbidities (particularly depression and fibromyalgia) that lead to patient-provider discordance. The findings of this study suggest that abrogation of the inflammatory activity of RA and management of associated comorbidities such as depression and fibromyalgia might help reduce patient-provider discordance. Future studies are needed to identify the mechanisms by which ANA-positive status without a clinical diagnosis of connective tissue disease contributes to a greater likelihood of future discordance.

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Abbreviations

ACR	American College of Rheumatology
ANA	antinuclear antibody
CCP	cyclic citrullinated peptide
CDAI	Clinical Disease Activity Index
CRP	C-reactive protein
DAS28-CRP(3)	disease activity score in 28 joints for C-reactive protein with the 3-variable version
DMARD	disease-modifying antirheumatic drug
DUO	epidemiological study of treatment decision in rheumatoid arthritis: doctor-reported outcomes and patient-reported outcomes
ESR	erythrocyte sedimentation rate
EULAR	European League Against Rheumatism
HAQ-II	Health Assessment Questionnaire II
OR	odds ratio
RA	rheumatoid arthritis
VAS	visual analog scale

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Significance and Innovations

- This study is among the first to evaluate longitudinal data recorded before positive discordance is identified between patients with rheumatoid arthritis and their health care providers in global assessments of disease activity in order to identify patient-level predictors and to determine the impact of discordance on treatment decisions.
- The main finding is that patients affected by patient-provider discordance may have higher disease activity earlier in the disease course, according to the Clinical Disease Activity Index and the disease activity score in 28 joints for C-reactive protein with the 3-variable version, compared with patients with concordant patient-provider global assessments.
- Other new predictors included positive antinuclear antibodies, nonerosive disease, history of depression, and previous use of antidepressant or fibromyalgia medications.
- Future research should explore new hypotheses about the relationships of uncontrolled clinical disease activity and the presence of antinuclear antibodies to the eventual occurrence of positive discordance among patients with RA.

Figure 1.

Design of the Case-Control Study. Cases with discordance and controls with concordance between patient and provider global assessments of disease activity were identified at the index visit and matched for age, sex, rheumatoid arthritis (RA) duration, and Clinical Disease Activity Index score. Exposure data were collected at baseline (ie, the date of diagnosis or earliest available visit when patient and provider global assessments were available) and at up to 11 clinical visits between the baseline and index visits.

Figure 2.

Trends in Clinical Assessment According to the Number of Years Before the Index Visit. A, Patient global assessment (GA). B, Pain visual analog scale (VAS). C, Provider GA. D, Patient-provider discordance (patient GA minus provider GA). Cases had positive patient-provider discordance; controls had concordance. Values are means.

Figure 3.

Trends in Clinical Disease According to the Number of Years Before the Index Visit. A, Clinical Disease Activity Index (CDAI) score. B, C-reactive protein (CRP) level. C, Tender joint count. D, Swollen joint count. Cases had positive patient-provider discordance; controls had concordance. Values are means.

Table 1.

Patient Characteristics at Baseline and Index Visits for Cases With Patient-Provider Discordance and Controls

Patient Characteristic	Baseline Visit			Index Visit		
	Controls (n=102) ^a	Cases (n=102) ^a	P Value	Controls (n=102) ^a	Cases (n=102) ^a	P Value
Patient global assessment (0–100), mm	25 (22.7)	42 (24.0)	<.001	31 (24.3)	59 (16.0)	<.001
Provider global assessment (0–100), mm	29 (28.3)	24 (19.4)	.94	29 (23.7)	16 (11.6)	<.001
CDAI	11 (10.8)	15 (10.6)	.001	12 (11.5)	12 (7.9)	.15
CDAI category			.02			.58
Remission or low disease activity (≤ 10)	48 (59%)	25 (39%)		55 (54%)	51 (50%)	
Moderate or high disease activity (>10)	33 (41%)	39 (61%)		47 (46%)	51 (50%)	
Unknown	21	38		0	0	
DAS28-CRP(3)	2.8 (1.2)	3.5 (1.3)	.001	2.9 (1.0)	3.0 (1.2)	.99
DAS28-CRP(3) category			.002			.54
Remission or low disease activity (≤ 3.2)	43 (70%)	21 (41%)		52 (67%)	54 (62%)	
Moderate or high disease activity (>3.2)	18 (30%)	30 (59%)		26 (33%)	33 (38%)	
Unknown	41	51		24	15	
Pain VAS (0–100), mm	31 (26.7)	45 (23.9)	<.001	35 (26.7)	58 (20.9)	<.001
HAQ-II	0.6 (0.7)	0.9 (0.7)	.001	0.7 (0.6)	1.0 (0.6)	<.001
Tender joint count (0–28)	3.4 (6.4)	5.2 (6.2)	.002	3.4 (5.7)	3.0 (5.0)	.67
Swollen joint count (0–28)	2.6 (4.8)	3.1 (3.4)	.02	2.8 (4.3)	2.8 (10.1)	.22
ESR, mm/h	12.6 (11.9)	17.1 (16.8)	.08	12.7 (11.9)	15.8 (16.0)	.41
CRP, mg/L	5.8 (5.4)	9.6 (14.0)	.13	8.2 (14.9)	7.4 (7.6)	.49
Education level						.99
Not a high school graduate				5 (5%)	5 (5%)	
High school graduate				26 (27%)	29 (31%)	
Beyond high school graduate				65 (68%)	60 (64%)	
Unknown				6	8	

Abbreviations: CDAI, Clinical Disease Activity Index; CRP, C-reactive protein; DAS28-CRP(3), disease activity score in 28 joints for C-reactive protein with the 3-variable version; ESR, erythrocyte sedimentation rate; HAQ-II, Health Assessment Questionnaire II; VAS, visual analog scale.

^aValues for CDAI categories and DAS28-CRP(3) categories are presented as number of participants (percentage of sample); other values are presented as mean (SD).

Table 2.**Predictors of Patient-Provider Discordance**

Characteristic	Control (n=102) ^a	Case (n=102) ^a	Odds Ratio (95% CI) ^b
At baseline visit			
ANA, positive	13/80 (16%)	25/80 (31%)	3.42 (1.21–9.63)
Discordance (patient global – provider global), mm	–4 (28)	22 (23)	1.74 (1.30–2.32) ^c
CDAI, per 12-unit change	10.8 (10.8)	15.4 (10.6)	1.72 (1.04–2.85)
Time from baseline to study visit, y	2.6 (1.2)	2.6 (1.2)	0.86 (0.61–1.20)
RF or anti-CCP antibodies, positive	79/100 (79%)	70/100 (70%)	0.68 (0.35–1.31)
At diagnosis of RA			
Use of methotrexate in first 6 mo	63/101 (62%)	73/100 (73%)	1.67 (0.88–3.16)
Radiographic evidence of erosions	16 (16%)	16 (16%)	1.09 (0.49–2.38)
Prednisone use	65 (64%)	71 (71%)	1.32 (0.72–2.39)
At or before the index discordant visit			
Antidepressant use	7 (7%)	20 (20%)	2.87 (1.21–6.80)
Fibromyalgia medication use	7 (7%)	18 (18%)	3.20 (1.17–8.74)
Fibromyalgia	10 (10%)	18 (18%)	2.14 (0.74–5.26)
Depression	27 (26%)	40 (39%)	1.94 (1.02–3.71)
Osteoarthritis	54 (53%)	63 (62%)	1.55 (0.83–2.90)
Opioid use	26 (25%)	39 (38%)	1.77 (0.94–3.22)
NSAID use	71 (70%)	74 (73%)	1.14 (0.63–2.06)
DMARD/biologic modification	76 (75%)	79 (77%)	1.16 (0.62–2.18)
Anxiety	19 (19%)	13 (13%)	0.67 (0.32–1.38)
Radiographic evidence of erosions	56/101 (55%)	39/99 (39%)	0.43 (0.22–0.83)

Abbreviations: ANA, antinuclear antibody; CCP, cyclic citrullinated peptide; CDAI, Clinical Disease Activity Index; DMARD, disease-modifying antirheumatic drug; NSAID, nonsteroidal anti-inflammatory drug; RA, rheumatoid arthritis; RF, rheumatoid factor.

^aValues are presented as number of participants (percentage of sample); as number of participants/number of participants with available data if less than 102 (percentage of sample); or as mean (SD).

^bOdds ratios from conditional logistic regression models adjusted for time from baseline to study visit.

^cOdds ratio reported per 10-unit increase.