Discordance of Global Assessments by Patient and Physician Is Higher in Female than in Male Patients Regardless of the Physician's Sex: Data on Patients with Rheumatoid Arthritis, Axial Spondyloarthritis, and Psoriatic Arthritis from the DANBIO Registry

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ABSTRACT. ***Objective.*** To assess the frequency of discordance in patient's (PtGA) and physician's (PGA) global assessment, and to investigate whether higher discordance in female patients compared with male patients is associated with the physician's sex in patients with rheumatoid arthritis (RA), axial spondyloarthritis (axSpA), and psoriatic arthritis (PsA).

Methods. PtGA, PGA, and other patient-related variables were retrieved from the Danish DANBIO registry, used nationwide to monitor patients with RA, axSpA, and PsA. A questionnaire was sent to all physicians registering in DANBIO (n = 265) regarding individual physician characteristics including sex and age. Discordance was defined as PtGA > 20 mm higher (or lower) than PGA. First encounters between patients and physicians were analyzed using descriptive statistics and mixed model regression analysis.

Results. Ninety physicians (34%) returned the questionnaire and were pairwise matched with 10,282 first patient encounters (8300 patients with RA, 524 axSpA, and 1458 PsA). The frequency of discordant (PtGA > PGA) encounters (not including PGA > PtGA seen in < 2%) in RA, axSpA, and PsA was 49.0%, 48.3%, and 56.5%, respectively. Discordance was more common in female patients with high scores on functional disability, pain, and fatigue across the 3 diseases, whereas it was independent of the physician's sex.

Conclusion. In this study on Danish patients with RA, axSpA, and PsA, the PtGA was > 20 mm higher than the PGA in about half of the encounters, and more common in female patients of both female and male physicians. This finding highlights one of the challenges in shared decision making. (First Release August 1 2015; J Rheumatol 2015;42:1781–5; doi:10.3899/jrheum.150007)

Key Indexing Terms:
RHEUMATOID ARTHRITIS ANKYLOSING SPONDYLITIS PSORIATIC ARTHRITIS
SELF-ASSESSMENT VISUAL ANALOG SCALE

Rheumatoid arthritis (RA), axial spondyloarthritis (axSpA), and psoriatic arthritis (PsA) are potentially severe, chronic inflammatory diseases[1,2]. Many of these patients receive lifelong medical treatments aimed at remission or low disease activity, presumably based on a shared decision between physician and patient. A frequently used measure of disease

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activity and treatment response is a global assessment completed by both the patient (PtGA) and the physician (PGA)[3]. Several studies of patients with RA have shown that discordance between the patient and physician assessments is common[4,5,6,7]. This lack of agreement has been pointed out as a potential problem in decision making regarding initiation or discontinuation of therapies[4,8]. Previous studies in nonrheumatic diseases have reported negative consequences of discordance, such as patient dissatisfaction and poorer adherence to treatment[9,10,11,12].

Reports concerning discordance of PGA versus PtGA have suggested that discordance is more likely in female than in male patients[5]. Possible differences in the likelihood of discordance in men and women according to the physician's sex have not been reported in the rheumatology literature, to our knowledge, although previous studies in nonrheumatology settings have suggested physician sex differences in clinical decision making[13,14]. In our study, we assessed the frequency of discordance between PtGA and PGA in a large, multiclinic cohort of patients with RA, axSpA, and PsA, and investigated whether discordance in male and female patients was associated with the physician's sex.

MATERIALS AND METHODS

We identified study physicians and their patients from the DANBIO, a Danish nationwide registry, in which physicians monitored their patients with RA, axSpA, and PsA longitudinally[3]. The patients are included in the registry when they fulfill the diagnoses according to the judgment of the treating physician, and there are no exclusion criteria. At the time of inclusion, many patients are already receiving treatment. Patient demographic variables are registered at the first visit. All hospital departments of rheumatology across the country participate, and in recent years, some private practice rheumatology clinics have also registered their patients. Physicians and consultants see patients across diagnoses.

A questionnaire was developed specifically for the present study and sent in March/April 2012 to all physicians who registered in the DANBIO (n = 265) to obtain individual physician data: sex, age, clinic site, consultant (yes/no), year and country (Denmark/other) of medical examination, and estimated number of patients seen per month. Age was classified into 2 groups: above and below the median age of the respondents. A specialist certificate of competence in rheumatology (yes/no) was used as a measure of experience.

DANBIO data based on first encounters between patients and their physicians in the registry were analyzed. Patient data were obtained from DANBIO for sex, age, duration of disease (years), Health Assessment Questionnaire (HAQ) score, serum C-reactive protein (CRP), swollen and tender joint counts at 28 joints, treatment (biological/nonbiological), and 100-mm visual analog scales (VAS) for PtGA, pain, and fatigue. The wording of the question for determining PtGA in DANBIO was: "How does your arthritis as a whole currently affect your everyday life?" The anchors for the patient VAS were defined as "not at all" (0 mm) and "unbearably much" (100 mm).

Further, PGA, assessed by 100-mm VAS scales, was obtained. The wording for the physician was "Evaluator VAS" with no words at the anchors (0 mm and 100 mm). PtGA was normally registered by the patient in the DANBIO prior to the encounter with the physician. Because of the different clinical practices across the country, PGA was sometimes scored with the physician having knowledge of the CRP test results and sometimes without. It was not possible to control for this in the analyses. Only encounters with complete data including CRP for all physician and patient variables were used in the analyses.

A difference of up to ± 20 mm between PtGA and PGA was considered concordant, and based on previous reports, consistent with the minimal clinically important improvement (MCII) in rheumatic disorders[15]. This yielded 3 groups: PtGA = PGA, termed "concordant group"; and PtGA > PGA and PGA > PtGA, termed the "discordant groups." PGA > PtGA was seen in fewer than 2% of encounters (1.9% in RA, 1.4% in axSpA, and 0.3% in PsA), and was excluded from further analyses. Sensitivity analyses with ± 15 mm and 25 mm cutoff points were performed to control for the robustness of the chosen cutoff level.

Statistics. Descriptive statistics were used to analyze the distribution of patient and physician characteristics, as well as clinical measures of disease activity, between the discordant and concordant groups. Categorical data were reported as frequencies (%). Continuous data were reported as median ± interquartile range (IQR). To compare the discordant-rated with the concordant-rated encounters, Pearson chi-square tests were used for categorical variables and Mann-Whitney U tests for continuous variables.

Mixed model logistic regression analyses for RA, axSpA, and PsA, respectively, were performed to assess the independent contribution of patient and physician characteristics to the concordant (PtGA = PGA) and discordant (PtGA > PGA) groups for each diagnosis. Variables from the univariate analyses were selected using a cutoff point of $p < 0.10$ for entry into the analyses. Patient and physician sex and age were added to the model because of our special focus on these aspects. The logistic regression analyses were performed with backward selection. The number of patient encounters varied between physicians, and occasionally a patient would switch physicians, and thus have more than 1 first encounter included in the study. Therefore, all physicians and some patients were included in the analyses more than once, and to control for this, both physicians and patients were included into the models as random effects. All analyses were performed using the R Project for Statistical Computing (www.R-project.org).

When HAQ was entered as a covariate in the multivariate analyses, the results contradicted the results from the univariate analyses. HAQ is associated with PtGA (higher HAQ gives higher PtGA). Sex is also a confounder associated with both HAQ (women have higher HAQ than men) and with PtGA (women score higher than men). Entering HAQ and sex into the model simultaneously resulted in an overcorrection, and therefore HAQ was omitted from the mixed model logistic regression analyses.

RESULTS

Physician and patient characteristics. A total of 90 physicians (40 women, medium age 47 yrs, IQR 36–53 and 50 men, median age 52 yrs, IQR 40–58) returned the questionnaire (34%). Fifty percent were consultants. The physicians were pairwise-matched with 10,282 first encounters (8300 patients with RA, 524 axSpA, and 1458 PsA), and the median number of patients that each physician saw per month was 50 (25–80). Median patient age was 61 years (50–69) for RA, 42 years (34–52) for axSpA, and 50 years (40–58) for PsA, and 74.0%, 28.4%, and 53.3% of patients were women, respectively.

Patient characteristics of concordant and discordant encounters for each of the 3 diagnoses are presented in Table 1. About half of all encounters were discordant (PtGA > 20 mm higher than PGA). Discordance was greater in female than male patients. Fatigue, pain, and functional disability were significantly higher in discordant than in concordant encounters.

With regard to the physician-related variables, presented in Table 2, physician age was largely similar in discordant and concordant encounters. There was no clear pattern in the

Table 1. Comparison of concordant and discordant encounters for patients with RA, axSpA, and PsA according to patient characteristics. Numbers based on first encounters. Values are n (%) or median (IQR) unless otherwise specified.

Characteristics	RA				AxSpA				PsA			
	PtGA > PGA, Discordant	PtGA = PGA, Concordant	p	All Encounters	PtGA>PGA, Discordant	PtGA = PGA, Concordant	p	All Encounters	PtGA > PGA, Discordant	PtGA = PGA, Concordant	p	All Encounters
All encounters	4065 (49.0)	4235 (51.0)	< 0.001	8300 (100)	253 (48.3)	271 (51.7)	< 0.001	524 (100)	824 (56.5)	634 (43.5)	< 0.001	1458 (100)
Patient sex												
Female	3119 (50.8)	3024 (49.2)	< 0.001	6143 (100)	92 (61.7)	57 (38.3)	< 0.001	149 (100)	500 (60.5)	326 (39.5)	< 0.001	826 (100)
Male	946 (43.9)	1211 (56.1)		2157 (100)	161 (42.9)	214 (57.1)		375 (100)	324 (51.3)	308 (48.7)		632 (100)
Patient age, yrs	61 (51–69)	61 (50–69)	0.285	61 (50–69)	42 (35–53)	42 (32–51)	0.257	42 (34–52)	50 (40–58)	51 (40–59)	0.439	50 (40–58)
Disease duration, yrs	8 (2–16)	7 (2–14)	0.001	7 (2–15)	6 (2–15)	7 (3–15)	0.076	6 (2–15)	4 (1–10)	5 (2–11)	0.047	5 (2–10)
CRP, mg/l	6 (3–13)	5 (2–10)	< 0.001	6 (3–11)	5 (2–12)	5 (2–9)	0.572	4 (2–10)	5 (2–9)	4 (2–9)	0.174	5 (2–9)
HAQ, all patients	1.1 (0.6– 1.6)	0.4 (0–1)	< 0.001	0.8 (0.3 –1.4)	NA	NA	—	NA	1 (0.5–1.5)	0.3 (0–0.8)	<0.001	0.6 (0.1–1.1)
Female	1.3 (0.8–1.8)	0.5 (0.1–1)	< 0.001	0.9 (0.4–1.5)					1.1 (0.8–1.6)	0.5 (0.1–0.9)	< 0.001	0.9 (0.4–1.4)
Male	0.9 (0.4–1.4)	0.1 (0–0.6)	< 0.001	0.5 (0–1)					0.8 (0.4–1.3)	0 (0–0.4)	< 0.001	0.4 (0–1)
Swollen joints	1 (0–3)	0 (0–3)	0.106	1 (0–3)	NA	NA	—	NA	0 (0–2)	0 (0–1)	0.012	0 (0–1)
Tender joints	2 (0–7)	1 (0–4)	< 0.001	2 (0–5)	NA	NA	—	NA	2 (0–7)	0.5 (0–3)	< 0.001	1 (0–5)
Pain VAS	51 (32–70)	17 (7–32)	< 0.001	32 (14–57)	58 (37–72)	15 (5–30)	< 0.001	32 (12–60)	55 (35–72)	17 (7–31)	< 0.001	36 (18–63)
Fatigue VAS	61 (42–77)	22 (8–43)	< 0.001	42 (19–67)	65 (47–77)	23 (8–41)	< 0.001	45 (20–70)	65 (49–78)	21 (8–42)	< 0.001	50 (22–70)
Patient global VAS	61 (46–76)	17 (7–31)	< 0.001	39 (17–64)	63 (47–77)	16 (5–26)	< 0.001	36 (15–65)	66 (48–80)	17 (7–28)	< 0.001	45 (19–70)

RA: rheumatoid arthritis; axSpA: axial spondyloarthritis; PsA: psoriatic arthritis; IQR: interquartile range; PtGA: patient's global assessment; PGA: physician's global assessment; CRP: C-reactive protein; HAQ: Health Assessment Questionnaire; VAS: visual analog scale (0–100 mm); NA: variable is not applicable for axSpA because not part of the standard measurements in the DANBIO registry.

Table 2. Comparison of concordant and discordant encounters for patients with RA, axSpA, and PsA according to physician characteristics. Numbers based on first encounters. Values are n (%) or median (IQR) unless otherwise specified.

Characteristics	RA				AxSpA				PsA			
	PtGA > PGA, Discordant	PtGA = PGA, Concordant	p	All Encounters	PtGA > PGA, Discordant	PtGA = PGA, Concordant	p	All Encounters	PtGA > PGA, Discordant	PtGA = PGA, Concordant	p	All Encounters
All encounters	4065 (49.0)	4235 (51.0)	< 0.001	8300 (100)	253 (48.3)	271 (52.7)	< 0.001	524 (100)	824 (56.5)	634 (43.5)	< 0.001	1458 (100)
Physician global VAS, 0–100 mm	14 (6–25)	10 (3–26)	< 0.001	12 (4–26)	15 (6–26)	7 (3–19)	< 0.001	10 (4–23)	14 (6–25)	9 (3–22)	< 0.001	12 (5–24)
Physician age, yrs	53 (47–56)	53 (47–56)	0.112	53 (47–56)	52 (45–54)	52 (40–54)	0.085	52 (41–54)	52 (45–56)	52 (47–56)	0.959	52 (46–56)
Physician sex												
Female	2352 (51.0)	2260 (49.0)	< 0.001	4612 (100)	150 (46.0)	176 (54.0)	0.213	326 (100)	466 (54.6)	388 (45.4)	0.083	854 (100)
Male	1713 (46.4)	1975 (53.6)		3688 (100)	103 (52.0)	95 (48.0)		198 (100)	358 (59.3)	246 (40.7)		604 (100)
Consultant												
Yes	3444 (49.8)	3476 (50.2)	0.001	6920 (100)	199 (50.3)	197 (49.7)	0.137	396 (100)	690 (57.2)	516 (42.8)	0.269	1206 (100)
No	621 (45.0)	759 (55.0)		1380 (100)	54 (42.2)	74 (57.8)		128 (100)	134 (53.2)	118 (46.8)		252 (100)
Country of medical exam												
Denmark	3629 (48.1)	3913 (51.9)	0.001	7542 (100)	235 (48.7)	248 (51.3)	0.673	483 (100)	739 (57.7)	542 (42.3)	0.019	1281 (100)
Other	436 (57.5)	322 (42.5)		758 (100)	18 (43.9)	23 (56.1)		41 (100)	85 (48.0)	92 (52.0)		177 (100)
No. patients seen per mo	80 (50–120)	80 (50–120)	0.141	80 (50–120)	75 (40–105)	60 (40–100)	0.295	60 (40–100)	75 (48–120)	60 (50–120)	0.502	64 (50–120)

RA: rheumatoid arthritis; axSpA: axial spondyloarthritis; PsA: psoriatic arthritis; IQR: interquartile range; PtGA: patient's global assessment; PGA: physician's global assessment; VAS: visual analog scale.

distribution of concordance and discordance across diagnoses in physicians of either sex. The same applied to specialization, i.e., having a specialist certification of competency in rheumatology, as well as country of medical examination.

To further explore the relationship between physician and patient sex, cross tabulations of physicians and patients by sex were performed. Despite statistically significant differences between male and female physicians in the PGA estimates of patients with RA, no clinically relevant differences (defined as a difference of > 20 mm) were found (data not shown).

The mixed effects logistic regression analyses, presented in Table 3, confirmed that the male patients had lower odds of discordance compared with female patients across all 3 diagnoses, although not statistically significantly in PsA. Older patients with RA had slightly higher odds of discordance. More swollen joints decreased the odds of discordance, while more tender joints were associated with slightly higher odds of discordance in RA and PsA. Patients who were not treated with biologicals tended to have lower odds of discordance. Disease duration was not statistically significant in this analysis. As for the physician characteristics, discordance was independent of physician's sex and age in the mixed effects logistic regression analyses (data not shown). Less experienced physicians (i.e., not yet specialized) tended to have lower odds of discordance (data not shown).

In the sensitivity analyses, performed with different cutoff levels for PtGA and PGA (15 mm and 25 mm), 56.5% and 41.7% of the encounters were discordant in RA, 55.9% and 41.8% in axSpA, and 63.7% and 49.7% in PsA, respectively. Mixed model regression analyses with 15 mm and 25 mm cutoff yielded results similar to the original analyses.

DISCUSSION

Our study indicates that discordance between patient and physician assessment of global disease activity is very common in RA, axSpA, and PsA. In about half of the encounters, the patient's global score was > 20 mm higher than the physician's global score. Our study was large, including 90 physicians and data from 10,282 first encounters with patients, and in contrast to previous studies, we studied not only patients with RA, but also with axSpA and PsA[4,5,6,7,16,17,18].

The effect of patient and physician sex on the discordance was a main focus in our study. The results of the multivariate analyses showed that patient male sex was associated with lower odds of discordance, even after controlling for clinical measures of disease, independent subjective variables such as pain and fatigue, and physician sex. Our results confirm a previous study[5] that indicated that discordance was more common in female than in male patients with RA. We found this to be similar among patients with axSpA and PsA. This could at least in part be explained by evidence of women experiencing pain differently from men, a finding that has been attributed to physical as well as psychological factors[19]. In addition, our data document that when focusing on clinically significant differences, discordance between patient's and physician's global disease scores is largely similar for female and male physicians, and in both younger and older physicians. This is reassuring seen in the light of previous research that indicates physician sex differences in clinical decision making[13,14]. However, the high prevalence of discordance in all 3 diseases presents a challenge to shared decision making.

We found more discordant encounters than what was reported in a study by Khan, *et al*[6], in which 30% of the patients scored higher than their physicians when using the same cutoff point (20 mm) as in our present study. In the study by Castrejón, *et al*[5], using a cutoff point for discordance equivalent to ours, the prevalence of concordant encounters was 48%, comparable with our findings. However, discordance (patients scoring higher than the physician) was 43%, and in 9%, the physician score exceeded the patient score, compared with < 2% in our present study. In a study by Barton, *et al*[4], in which the cutoff point was 25 mm, 31% of encounters were discordant compared with 42% in our study (shown in the sensitivity analysis). The higher prevalence of discordance in our present study could at least in part be explained by the fact that our patients had lower levels of inflammation. In Khan, *et al*'s and Barton, *et al*'s studies, as well as in ours, patients and physicians were more concordant when patients had objective signs of disease activity, e.g., swollen joints were present and C-reactive protein levels relatively high. Thus, the physician focuses on inflammatory activity when making the global assessment, whereas the patient probably also incorporates the effect of damage, as well as psychological distress and possible fibromyalgia[20]. One consequence of this finding may be that

Table 3. Mixed effects logistic regression of predictors of discordance between patient's and physician's assessments of global disease activity. The model was adjusted for disease duration (years) and country of medical examination. To account for clustering by physician and patient, these variables were included in the model as random effects.

Characteristics	RA, n = 8300 Encounters		AxSpA, n = 524 Encounters		PsA, n = 1458 Encounters	
	Adjusted OR (95% CI)	p	Adjusted OR (95% CI)	p	Adjusted OR (95% CI)	p
Patient sex, male (female = 1.0)	0.80 (0.69–0.93)	0.004	0.29 (0.16-0.52)	< 0.001	0.75 (0.56–1.02)	0.063
Patient age, 1-yr increase	1.01 (1.01–1.01)	0.001	NS		NS	
SJC28, 1-joint increase	0.81 (0.79–0.83)	< 0.001	NA		0.93 (0.88–0.99)	0.012
TJC28, 1-joint increase	1.03 (1.02–1.05)	< 0.001	NA		1.09 (1.06–1.12)	< 0.001
CRP, 1-ml/l increase	1.009 (1.006–1.012)	< 0.001	NS		NS	
Biological treatment, no (yes = 1.0)	0.82 (0.73–0.92)	< 0.001	0.49 (0.31-0.78)	0.002	NS	

RA: rheumatoid arthritis; axSpA: axial spondyloarthritis; PsA: psoriatic arthritis; SJC28: swollen joint count (0–28); TJC28: tender joint count (0–28); CRP: C-reactive protein; NS: variable was excluded in the backward selection process; NA: variable is not applicable for axSpA because not part of the standard measurements in the DANBIO registry.

in a treat-to-target population aiming at remission or low disease activity, discordance may be more prevalent. Our findings emphasize the relevance of including both patient- and physician-reported outcomes in the evaluation of disease effect.

The major strength of our present study is that it was based on real-life data from a large number of patients and physicians, included 3 diagnoses, and represented both hospital and private practitioners across Denmark.

Our study also has limitations. First, the physician response rate to the questionnaire was 34%, even after a reminder was sent to nonresponders. However, the sex distribution of the respondents was equal to that of nonrespondents (44.4% women vs 46.6% men), and the frequency of discordance was also similar in responders versus nonresponders. Second, the number of patients that each physician encountered varied considerably, which may have caused bias. However, in mixed model logistic regression analyses, the results were largely similar regardless of the inclusion of clustering by physician or not (data not shown). Third, there is no standard accepted cutoff point for discordance. Differences ranging from 5 mm to 30 mm have been applied in earlier studies[4,5,6,7]. We chose a cutoff of 20 mm because it was regarded as the MCII in rheumatic disorders[15], and we have previously shown in test-retest studies that 20 mm is a relevant cutoff[21]. Our sensitivity analyses with different cutoff points showed that the results were robust. Finally, the wording of the question for determining global disease activity in DANBIO, as well as the anchors, are different for patients and physicians, and might also be different from wordings used in previous studies. This might have an effect on the results.

The frequency of discordance in our study on Danish patients with RA, axSpA, and PsA and their physicians was high, and more common in female patients and in patients with few objective signs of disease activity. Discordance was independent of the physician's sex.

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