MDHAQ/RAPID3 to Recognize Improvement Over 2 Months in Usual Care of Patients With Osteoarthritis, Systemic Lupus Erythematosus, Spondyloarthropathy, and Gout, as Well as Rheumatoid Arthritis

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Objective: To analyze whether MDHAQ (Multidimensional Health Assessment Questionnaire) scores for physical function (FN), pain, Patient Global Estimate (PATGL), and RAPID3 (Routine Assessment of Patient Index Data, a composite of these 3 measures) document improvement in patients with osteoarthritis, systemic lupus erythematosus, spondyloarthropathy, and gout, similarly to rheumatoid arthritis.

Methods: In a solo rheumatology practice, every patient completes an MDHAQ/RAPID3 and is assigned a Physician Global Estimate (DOCGL) at every visit. Mean and median FN (0–10 scale), pain (0–10), PATGL (0–10), RAPID3 (0–30), and DOCGL (0–10) were computed at first visit and 2 months later in 141 new patients with 5 diagnoses. Proportions with RAPID3 high (>12), moderate (6.1–12), and low (3.1–6) severity and remission (≤3) were computed. Differences between baseline and 2-month follow-up for each diagnosis were analyzed using paired *t* tests. Mean changes over 2 months across 5 diagnoses were compared using analysis of variance.

Results: Mean baseline scores for all measures were in narrow ranges for all 5 diagnoses: FN 1.5 to 2.5, pain 4.2 to 5.9, PATGL 4.3 to 5.6, RAPID3 10.1 to 13.7, and DOCGL 2.4 to 4.0. Improvement for FN was 9.4% to 26.8% in all diagnoses but osteoarthritis, for pain 20.2% to 35.3% in all diagnoses, PATGL 11.3% to 30.4%, RAPID3 16.8% to 27.5%, and for DOCGL 23.8% to 36.4%, similar in 5 diagnostic groups.

Conclusions: MDHAQ, RAPID3, and DOCGL document similar baseline and improvement scores in patients with 5 diagnoses. These quantitative data may supplement traditional narrative, "gestalt" descriptions in usual care of patients with any rheumatic disease.

Key Words: RAPID3, disease activity index, rheumatic diseases, responsiveness

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Quantitative assessment in rheumatic diseases is complicated by the absence of a single "gold standard" measure, such as blood pressure or serum glucose, which can be applied to all individual patients with a specific diagnosis.[1] Therefore, indices composed of multiple measures have been developed.[2–6] These indices are used widely in clinical trials and other clinical research, but appear impractical for usual care[7]—for example, a formal joint count requires more than 90 seconds during the clinical encounter[8]—and are not used by the majority of US rheumatologists.[9] Indeed, the only quantitative clinical data in the medical records of most patients seen by rheumatologists are laboratory tests, which often are normal and uninformative[10] and not available at a patient encounter.[3]

A Multidimensional Health Assessment Questionnaire (MDHAQ)[11] has been developed to provide quantitative data concerning aspects of a patient history, rather than "gestalt" clinical impressions, in usual rheumatology patient care.[12] Routine Assessment of Patient Index Data (RAPID3), an index of only the 3 patient self-report RA Core Data Set measures—physical function (FN), pain, and Patient Global Estimate (PATGL)—is correlated significantly with the 28-joint Disease Activity Score (DAS28)[2] and Clinical Disease Activity Index (CDAI),[3] indices that require formal joint counts and more than 90 seconds to compute, in rheumatoid arthritis (RA) clinical trials of adalimumab,[13] abatacept,[14] and certolizumab[15] and in clinical care of RA patients.[8,16] RAPID3 distinguishes active from control treatments in clinical trials similarly to traditional indices[13–15] but is scored in 5 seconds on the MDHAQ compared with more than 100 seconds for DAS28 and CDAI.[8,17]

Most clinical settings that have successfully incorporated MDHAQ/RAPID3 have developed a practice in which every patient, with every diagnosis, completes the same questionnaire at every visit in the waiting area[18] in the infrastructure of clinical care.[19] MDHAQ/RAPID3 provides additional advantages to help prepare the patient for the visit, improve doctor-patient communication, and save time for the doctor.[20,21] Although most reports of RAPID3/MDHAQ concern patients with RA, MDHAQ/RAPID3 has been found informative in osteoarthritis (OA),[22,23] systemic lupus erythematosus (SLE),[24] and most rheumatic diseases.[25–27] This report presents prospective longitudinal analyses of RAPID3 and component scores at first visit and 2 months later in patients with OA, SLE, spondyloarthropathy (SpA), and gout, compared with responses in patients with RA.

PATIENTS AND METHODS

Patients

All patients included in this study were seen in 1 solo rheumatology private practice setting of M.J.B. (established in 1987) and had a first visit to this practice between December 2007 and March 2011. In this setting, each patient with any diagnosis completes an MDHAQ[11] in 5 to 10 minutes in the waiting area before each encounter, as a routine practice. Diagnoses were assigned by the rheumatologist. The study was granted a waiver by the institutional review board of Mercy Catholic Medical Center.

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MDHAQ Questionnaire

The MDHAQ is a 2-page, single-sheet instrument, adapted for usual care in a clinical setting from the standard HAQ to add information concerning a self-report joint count, review of systems and recent medical history and to facilitate review and scoring by a health professional in a busy clinical setting.[28] The MDHAQ was developed primarily to improve clinical care, rather than for research.[29] Patients complete the MDHAQ while waiting to see the physician, so that scores are reviewed by the rheumatologist before or at the time the patient is seen.

Page 1 of the MDHAQ includes 5 scales to assess FN, psychological distress, pain, PATGL, and a RADAI (Rheumatoid Arthritis Disease Activity Index) self-report joint count.[30] The FN scale includes 10 activities as a score of 0 to 30, which is recoded as 0 to 10 using a scoring template on page 1 of the MDHAQ. The MDHAQ pain and PATGL visual analog scale are scored 0 to 10 on 21 numbered circles (numbered in 0.5 increments).[31] The psychological items and RADAI self-report joint count are helpful clinically,[11,32] but generally are not scored formally in usual care, and not included in this report. Another report documents the value of the RADAI in most rheumatic diseases.[32]

RAPID3 scores are calculated from the 3 RA Core Data Set[33] measures for FN, pain, and PATGL, each scored 0 to 10 for a total score range of 0 to 30,[17] before the encounter with the rheumatologist. RAPID3 severity categories, defined in RA, are 3 or less for remission, 3.1 to 6.0 for low severity, 6.1 to 12.0 for moderate severity, and more than 12 for high severity.[15,16,34] Physician Global Estimate (DOCGL) also is scored 0 to 10 on a 21-circle visual analog scale.[35] In patients with RA, a 28-joint count is performed, which generally involves about 90 seconds.[8] A DOCGL is assigned by the rheumatologist at the end of each visit.

Statistical Analyses

All statistical analyses were performed using Stata 12.0 for Windows (StataCorp LP, College Station, TX). Mean and median levels of demographic and clinical variables; MDHAQ scores for FN, pain, PATGL, and RAPID3; and DOCGL were calculated at baseline (initial visit) and compared in diagnostic groups using χ^2 test for categorical variables and analysis of variance (ANOVA) for continuous variables. Baseline MDHAQ/RAPID3 and DOCGL scores were compared with scores at first follow-up visit (median interval, 66 days; mean, 58.7 [SD, 20.3] days; range, 10–91 days, including 30–91 days in 130 of 141 observations), simplified as "2 months later," in all patients and 5 diagnostic groups, RA, OA, SLE, SpA, and gout, using a *t* test for paired data to analyze statistical significance between baseline and 2 months later. The percentage improvement for each of 5 diagnostic groups also was calculated. Mean differences from baseline to 2-month follow-up were compared in the 5 diagnostic groups using ANOVA. The proportions of patients in each of 4 RAPID3 severity categories were calculated at baseline and the 2-month visit in all patients and in the 5 diagnostic groups.

RESULTS

Baseline Measures

Overall, 141 new patients were studied, including 39 with RA, 41 with OA, 14 with SLE, 23 with SpA, and 24 with gout (Table 1). Among the 141 patients, 100 (72%) were women. Mean age was 59.2 years, ranging from a mean of 44.5 years for SLE to a mean of 67.2 years for OA. Mean level of formal education was 13.5 years, similar in all groups. Mean disease duration was 5.2 years, ranging from 3.5 years in RA to 7.3 years in SLE (Table 1).

Mean FN score in all patients was 2.0 on a 0- to 10-point scale (0.7 on a traditional 0- to 3-point scale), ranging from 1.5 in SLE to 2.5 in RA ($P = 0.12$). Mean pain score was 5.2 on a 0- to 10-point scale, ranging from 4.2 in SLE to 5.9 in SpA ($P = 0.51$). Mean PATGL was 5.0, ranging from 4.3 in gout to 5.6 in SpA ($P = 0.48$). Mean RAPID3 score (on a scale of 0–30) for all patients was 12.2, just above the threshold of 12, indicating high severity ($P = 0.39$). The range in different diseases was relatively narrow, 10% of maximum (0.10 units) for FN, 15% (0.15 units) for pain, 13% (0.13 units) for PATGL, and 12% (0.36 units for 0- to 30-point scale) for RAPID3.

Mean DOCGL was 3.4 (on a 0- to 10-point scale), ranging from 2.4 in gout to 4.0 in SpA. The range in 5 diagnoses for DOCGL of 1.6 units, 16% of maximum, again was relatively narrow and not statistically significant between groups. Higher PATGL versus DOCGL scores were seen in each of the 5 diagnostic groups, findings consistent with reported observations.[36]

TABLE 1. Baseline Demographic and Clinical Variables for the 141 Patients Included in the Study

		Patients by Diagnosis					
	All (n = 141)	RA (n = 39)	OA (n = 41)	SLE (n = 14)	SpA (n = 23)	Gout (n = 24)	*P*
Demographic variables							
Women, no. (%)	100 (72%)	34 (90%)	27 (67%)	12 (85%)	14 (61%)	13 (54%)	0.01
Age, mean (SD), y	59.2 (15.2)	56.8 (13.9)	67.2 (12.2)	44.5 (13)	52.7 (16.9)	64.1 (11.3)	<0.0001
Disease duration, mean (median), y	5.2 (1.4)	3.5 (1)	6.1 (2)	7.3 (0.9)	6.5 (3.6)	4.3 (1.1)	0.51
Education level, mean (SD), y	13.5 (2.1)	13.5 (2.2)	13 (1.7)	14.8 (2.1)	13.8 (2.2)	13.2 (2.4)	0.08
RA Core Data Set measures							
MDHAQ-FN, mean (SD) (0–3)	0.7 (0.3)	0.7 (0.3)	0.7 (0.3)	0.3 (0.3)	0.7 (0.7)	0.3 (0.3)	0.12
MDHAQ-FN, mean (SD) (0–10)	2.0 (1.7)	2.5 (2.1)	1.8 (1.4)	1.5 (1.3)	2.2 (2.1)	1.6 (1.3)	0.12
Pain, mean (SD) (0–10)	5.2 (2.9)	5.2 (2.6)	5.3 (2.9)	4.2 (2.8)	5.9 (3.1)	4.9 (3.3)	0.51
PATGL, mean (SD) (0–10)	5.0 (2.7)	4.9 (2.8)	5.2 (2.5)	4.5 (2.9)	5.6 (2.6)	4.3 (2.8)	0.48
RAPID3, mean (SD) (0–30)	12.2 (6.3)	12.6 (6.4)	12.4 (6.0)	10.1 (6.2)	13.7 (6.7)	10.9 (6.6)	0.39
DOCGL, mean (SD) (0–10)	3.4 (1.8)	3.9 (1.6)	3.6 (1.9)	2.6 (1.9)	4.0 (1.9)	2.4 (1.4)	0.002

Comparability between patients by diagnosis was assessed using χ^2 test for categorical variables (%) and ANOVA for continuous variables.

Changes in Scores Over 2 Months

Baseline FN scores were improved from 2.0 to 1.7 (15.5%) in all patients and all diagnostic groups other than OA, including 2.5 to 1.9 (26.0%) in RA, 1.5 to1.1 (24.0%) in SLE, 2.2 to 1.6 (26.8%) in SpA, and 1.6 to 1.4 (9.4%) in gout (Table 2); differences were statistically significant in all patients and RA, but not in other diagnostic subgroups. Mean pain scores were improved from 5.2 to 3.8 (26.9%) in all patients and in all diagnostic groups: 5.2 to 3.9 (25.4%) in RA, 5.3 to 3.9 (27.4%) in OA, 4.2 to 3.0 (28.1%) in SLE, 5.9 to 4.7 (20.2%) in SpA, and 4.9 to 3.2 (35.3%) in gout; differences in all patients, RA, OA, and gout were statistically significant. Mean PATGL scores were improved from 5.0 to 4.0 (19.6%) in all patients, and in all diagnostic groups, including 4.9 to 3.4 (30.4%) in RA, 5.2 to 4.6 (11.9%) in OA, 4.5 to 3.3 (26.2%) in SLE, 5.6 to 5.0 (11.3%) in SpA, and 4.3 to 3.3 (23.3%) in gout; differences in all patients, RA, OA, and gout were statistically significant. RAPID3 scores were improved by 22.2% in all patients and all diagnostic groups, including 27.5%, 16.8%, 26.8%, 17.7%, and 26.4% in RA, OA, SLE, SpA, and gout, respectively; differences in all patients, RA, OA, and gout were statistically significant. Mean DOCGL was improved by 31.2% in all patients and in all diagnostic groups including 29.0%, 36.4%, 35.8%, 23.8%, and 29.6% in RA, OA, SLE, SpA, and gout, respectively; differences in all patients, RA, OA, and gout were statistically significant, reflecting findings of patient self-report scores (Fig. 1).

The proportion of patients with high RAPID3 severity was improved from 50% to 35% in all patients, and in all diagnostic groups: from 54% to 31% in RA, 51% to 44% in OA, 36% to 14% in SLE, 52% to 43% in SpA, and 46% to 29% in gout (Table 3). The proportion of patients in low severity or remission

TABLE 2. Mean (SD) FN, Pain, PATGL, RAPID3, and DOCGL Scores of Patients With 5 Rheumatic Diseases at Baseline and After 2 Months of Follow-up

	Baseline Mean (SD)	2 mo Mean (SD)	P[a]	Mean Change[b]	% Improvement
FN (MDHAQ-FN) (0–10)					
All patients	2.0 (1.7)	1.7 (1.7)	0.0028	0.34	15.5
RA	2.5 (2.1)	1.9 (1.8)	0.02	0.65	26.0
OA	1.8 (1.4)	1.8 (1.7)	0.95	0.01	0.6
SLE	1.5 (1.3)	1.1 (1.7)	0.21	0.36	24.0
SpA	2.2 (2.1)	1.6 (1.7)	0.06	0.59	26.8
Gout	1.6 (1.3)	1.4 (1.8)	0.45	0.15	9.4
Pain (0–10)					
All patients	5.2 (2.9)	3.8 (3.0)	<0.0001	1.40	26.9
RA	5.2 (2.6)	3.9 (3.2)	0.014	1.32	25.4
OA	5.3 (2.9)	3.9 (2.8)	0.0012	1.45	27.4
SLE	4.2 (2.8)	3.0 (3.0)	0.10	1.18	28.1
SpA	5.9 (3.1)	4.7 (3.0)	0.10	1.19	20.2
Gout	4.9 (3.3)	3.2 (3.1)	0.02	1.73	35.3
PATGL (0–10)					
All patients	5.0 (2.7)	4.0 (3.1)	<0.0001	0.98	19.6
RA	4.9 (2.8)	3.4 (3.0)	0.004	1.49	30.4
OA	5.2 (2.5)	4.6 (3.0)	0.09	0.62	11.9
SLE	4.5 (2.9)	3.3 (3.5)	0.14	1.18	26.2
SpA	5.6 (2.6)	5.0 (2.9)	0.31	0.63	11.3
Gout	4.3 (2.8)	3.3 (3.2)	0.05	1.00	23.3
RAPID3 (0–30)					
All patients	12.2 (6.3)	9.5 (7.3)	<0.0001	2.71	22.2
RA	12.6 (6.4)	9.2 (7.6)	0.0037	3.46	27.5
OA	12.4 (6.0)	10.3 (6.9)	0.012	2.08	16.8
SLE	10.1 (6.2)	7.4 (7.8)	0.089	2.71	26.8
SpA	13.7 (6.7)	11.3 (7.1)	0.096	2.42	17.7
Gout	10.9 (6.6)	8.0 (7.4)	0.024	2.88	26.4
DOCGL (0–10)					
All patients	3.4 (1.8)	2.4 (1.8)	<0.0001	1.06	31.2
RA	3.9 (1.6)	2.8 (1.9)	0.0004	1.13	29.0
OA	3.6 (1.9)	2.3 (2.0)	<0.0001	1.31	36.4
SLE	2.6 (1.9)	1.6 (2.0)	0.09	0.93	35.8
SpA	4.0 (1.9)	3.0 (1.6)	0.04	0.95	23.8
Gout	2.4 (1.4)	1.7 (1.5)	0.02	0.71	29.6

[a] P, repeated-measures t test (change from baseline over 2 months for each disease).

[b] P not significant by ANOVA, comparison between RA and each diagnosis for mean change from baseline for all measures.

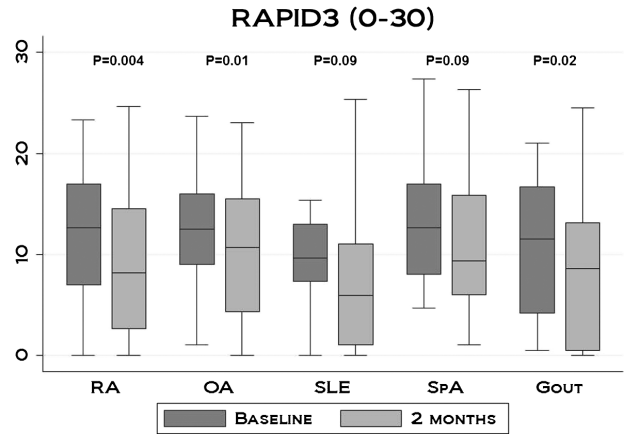

FIGURE. Median, interquartile range, and limits of 95% confidence interval for RAPID3 score in patients with RA (n = 39), OA (n = 41), SLE (n = 14), SpA (n = 23), and gout (n = 24), at baseline and 2 months later. *P*, repeated-measures *t* test (changes in RAPID3).

was increased from 20% to 40% in all patients and all diagnostic groups, including 14% to 49% in RA, 19% to 34% in OA, 14% to 50% in SLE, 22% to 26% in SpA, and 29% to 46% in gout (Table 3).

DISCUSSION

The HAQ, MDHAQ, and RAPID3 were developed initially to assess disease status and changes over time in patients with RA. However, most usual care settings that collect quantitative patient self-report questionnaires successfully ask all patients to complete the same questionnaire, generally upon registration at the clinic.[18] Use of MDHAQ/RAPID3 as the same "test" for all patients may be analogous to laboratory tests such as erythrocyte sedimentation rate and C-reactive protein, which may be applied to patients with any rheumatic disease.

It has been suggested that the DAS "appears impractical to use in daily practice,"[7] based on observations in the clinic. RAPID3 is scored in about 5 seconds by a rheumatologist or an assistant[8] versus more than 90 seconds for a DAS28 or CDAI, traditional indices that include a formal joint count. Formal joint counts require about 90 seconds[8] and are not performed at most visits of RA patients.[37]

Disease-specific questionnaires may be optimal for clinical trials and other research studies, but it is not feasible to have patients complete different self-report questionnaires in busy clinical settings. MDHAQ/RAPID3 completed by the patient in the waiting area also provides data at the onset of the visit, rather than acquired during a visit, providing an agenda or "roadmap" for the encounter.[21] This process is analogous to an available blood pressure, hemoglobin A_{1c} or radiograph for the physician at the onset of the visit of a patient with hypertension, diabetes, or a healing fracture, rather than during or after the visit. Further advantages of an MDHAQ completed by a patient in the waiting area include support to help the patient prepare for the encounter, improve doctor-patient communication, and save time for the doctor through the self-report joint count, review of systems, and recent medical history on the MDHAQ.[38]

From the perspective of the rheumatologist, RA, OA, SLE, SpA, and gout are very different diseases, with very different pathogenic mechanisms and treatments. However, from the perspective of the patient, these rheumatic diseases may be more similar to one another than generally recognized. Most patients with any rheumatic diseases, including the 5 studied in this report, experience reduced FN and elevated scores for pain, PATGL, and RAPID3.

Results presented in this report extend evidence that scores for RAPID3—and its individual components, FN, pain, and PATGL—are informative in patients with OA,[22,23] SLE,[24] and most rheumatic diseases.[25–27] The similarity of baseline scores in patients with 5 different diagnoses is striking. Furthermore, RAPID3 and its 3 components exhibit similar responsiveness to change in SLE, SpA, OA, and gout as seen in RA.

Several limitations are seen to this study. First, the data are reported in groups, with a narrow range of mean baseline

TABLE 3. Number and Percentage of Patients in Different Categories of Disease Activity According to RAPID3, as a Single Group and According to Diagnosis

RAPID3	All (n = 141)		RA (n = 39)		OA (n = 41)		SLE (n = 14)		SpA (n = 23)		Gout (n = 24)	
Category	0 mo	2 mo	0 mo	2 mo	0 mo	2 mo	0 mo	2 mo	0 mo	2 mo	0 mo	2 mo
Remission	13	38	3	11	3	9	2	5	0	3	5	10
(≤3)	9%	27%	7%	29%	7%	22%	14%	36%	0%	13%	21%	42%
Low	15	19	3	8	5	5	0	2	5	3	2	1
(3.1–6)	11%	13%	7%	20%	12%	12%	0%	14%	22%	13%	8%	4%
Moderate	43	35	12	8	12	9	7	5	6	7	6	6
(6.1–12)	30%	25%	30%	20%	30%	22%	50%	36%	26%	31%	25%	25%
High	70	49	21	12	21	18	5	2	12	10	11	7
(>12)	50%	35%	54%	31%	51%	44%	36%	14%	52%	43%	46%	29%

and 2-month scores, but considerable variation in individual patients. However, most clinical research data, including clinical trials, are reported as mean values of group data.

Second, only 1 clinical practice is analyzed, and the number of patients is limited. The small numbers preclude analyses of patient variables that might be associated with self-report scores, such as age, education level, duration of disease, and others. Further data from other clinical settings appear required to clarify optimal use and interpretation of MDHAQ/RAPID3 data in usual care.

Third, formal comparisons of RAPID3 scores with scores on disease-specific questionnaires in different diseases—such as the Systemic Lupus Activity Questionnaire,[39] Bath Ankylosing Spondylitis Functional Index,[40] and Western Ontario and McMaster Universities Arthritis Index[5]—appear needed to analyze how informative they might be in SLE, SpA, or OA compared with MDHAQ/RAPID3.

Nonetheless, the data suggest that MDHAQ individual and RAPID3 scores may be informative in a large proportion of patients with many rheumatic diseases. The narrow range of mean MDHAQ/RAPID3 scores in all 5 diseases studied is similar to the range of baseline and 2-month improvement according to physician global scores, suggesting face validity of the patient self-report data. Face validity also is supported by the age and gender distribution of the patients with different diagnoses, which appears typical of patients described in the medical literature. The patterns in different disease self-report scores—for example, no improvement of function but improvement in pain in OA, more favorable function scores in SLE—also suggest face validity. However, these observations will require extensive further research to confirm the results and perhaps add to interpretation for better patient care.

Assessment of a patient with any rheumatic disease, or any disease, requires a careful history and physical examination, as well as relevant laboratory tests and imaging studies, to formulate an optimal treatment plan for each individual patient. RAPID3 scores add quantitative clinical information, which appears informative in patients with OA, SLE, SpA, and gout, in addition to RA, including improvement over 2 months in a similar range of 16.8 to 27.5% in patients with all 5 diagnoses. RAPID3 appears useful to document status and clinical improvement according to quantitative scores in usual clinical care of patients with most rheumatic diseases. The authors suggest that rheumatologists consider a practice in which all patients are asked to complete a self-report MDHAQ/RAPID3 at all visits in the infrastructure of usual clinical care, to support traditional narrative, "gestalt" descriptions and help guide clinical decisions with quantitative data.

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