Influence of an Educational Seminar on Use of Disease Activity Measurements by Rheumatologists in Treatment of Rheumatoid Arthritis

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ABSTRACT. ***Objective.*** To determine the variables underlying clinical decisions made by rheumatologists when treating patients with rheumatoid arthritis (RA), and to determine the effect of an educational seminar on the use of quantitative disease activity measurements in clinical practice in this population of physicians.

Methods. Practicing rheumatologists were surveyed on the variables affecting their clinical management of patients with RA by questionnaire. Physicians were divided into 2 groups: the first comprised attenders (Group A) to an educational seminar in the use of the quantitative disease activity measurements in patient management, while the second group comprised nonattenders (Group NA). Both groups were surveyed on their practice behavior before (Survey 1) and 2 to 3 months after (Survey 2) the seminar.

Results. Fifty-two rheumatologists in clinical practice from across the US completed and returned 364 surveys. A significantly greater number of rheumatologists in Group A reported use of disease activity measures following the training seminar (Survey 2), compared to their use pre-meeting and compared to Group NA ($p < 0.0001$).

Conclusion. Our results support employment of an educational seminar on the use of disease activity measurements to increase the use of these quantitative measures in rheumatologic practice. (First Release Jan 15 2009; J Rheumatol 2009;36:532–8; doi:10.3899/jrheum.080291)

Key Indexing Terms:
DISEASE ACTIVITY MEASUREMENT RHEUMATOID ARTHRITIS

Treatment goals for rheumatoid arthritis (RA) are to alleviate patient suffering in the short term and to prevent disability in the long term. When rheumatologists make decisions that affect the management of patients with RA, including assessing the success of a treatment regimen, they generally begin by assessing disease activity. Historically, rheumatologists assess disease activity by formulating an ad hoc clinical impression of disease activity commonly referred to as a "gestalt," which guides decision-making about subsequent management. Rheumatologists report rarely implementing the use of a published, standardized assessment tool to evaluate the level of disease activity and/or to guide treatment[1].

Disease activity measurements (DAM) have been reported in clinical trials to assess the outcome of differing treatment regimens, including the American College of Rheumatology (ACR) scoring system[2], the Disease Activity Score (DAS)[3], the Sharp Score[4], the Genant Score[5], different versions of the Health Assessment Questionnaire (HAQ)[6], and the Medical Outcomes Study Short-Form 36 (SF-36)[7]. However, the tracking measures employed in trials may not prove useful in the clinical setting. There has been extensive publication about the use of the HAQ[8] and other patient-reported outcomes measures (PROM), including the Global Arthritis Score (GAS)[9], Routine Assessment of Patient Index Data (RAPID)[10], Clinical Disease Activity Index (CDAI)[11], and Simple Disease Activity Index (SDAI). Because all but the SDAI do not require the results of concomitant blood tests, they are suitable for use in clinical practice. There is considerable overlap in the data acquired and utilized to calculate PROM. Assessment of disease activity using the PROM listed above has been shown to have predictive outcomes value[12] and to correlate well with the DAS and ACR scoring systems[13]. PROM such as the HAQ or Multidimensional Health Assessment Questionnaire (MDHAQ) predict severe RA longterm outcomes such as work disability or premature mortality with greater significance than joint counts, laboratory tests, or radiographic scores[12,14]. PROM are as informative as the ACR scoring

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system in distinguishing active from control treatments in clinical trials[15].

Some studies suggest at least 85% of practicing rheumatologists report that they are gestaltists[16]. However, evidence has been published demonstrating that a standardized or more objective approach to DAM is superior to the gestaltist approach[17-20]. The Tight Control of Rheumatoid Arthritis (TICORA) and the BeSt (Dutch acronym for Behandel-Strategieen, "treatment strategies") studies demonstrated that "tight control" of RA leads to lower cost and better treatment outcomes[21,22]. In addition, it has been suggested that aggressive management of RA may result in fewer comorbidities[23].

Thus, a strong argument can be made for implementing the use of a consistent and standardized approach to DAM in the management of RA. The initiative reported here was originally conceived to delineate the variables frequently used and extent of utilization of standardized DAM by practicing rheumatologists when assessing RA disease activity. The scope of the initiative was expanded to include the implementation of an educational program that intended to influence rheumatologists to adopt the use of a standardized DAM.

The investigators hypothesized that rheumatologists could be influenced to adopt the use of a DAM if presented with (1) an update on DAM; (2) evidence that rheumatologists are already acquiring most of the data required for calculating a DAM, and thus only minor clerical and behavioral changes are required to implement utilizing a DAM in clinical practice; and (3) a tutorial on how to complete and utilize a DAM. They hypothesized that exposure to an educational program on DAM (DAM meeting) would effect a physician behavioral change in the utilization of DAM in their practice. Evidence of this behavioral change was tracked by questionnaires before and after the DAM meeting.

MATERIALS AND METHODS

Planning conference and survey design. A planning conference involving 8 rheumatologists and one behavioral psychologist was held to devise a survey tool to be used to acquire the data about DAM and PROM utilization. Following the conference, the authors prepared an exhaustive list of the measures to assess disease activity identified during the discussion to form the basis of a questionnaire (Table 1).

Effect of DAM meeting on DAM use. Two groups of rheumatologists from across the US were surveyed utilizing the comprehensive questionnaire developed during the planning conference. Group A comprised 21 rheumatologists who were confirmed to attend the DAM educational program in August 2007. The number of rheumatologists in Group A was limited by the amount of the grant funding the initiative. Group NA comprised 31 rheumatologists who completed the questionnaires but were not attending the educational program. Group NA included rheumatologists from Arkansas, Florida, Illinois, New York, Ohio, South Carolina, Tennessee, and Washington. Some members of Group NA were associates of the rheumatologists in Group A.

Instructions included in the questionnaire requested that each rheumatologist complete up to 5 questionnaires, with each questionnaire to be completed following an encounter with a patient with RA. Respondents were requested to complete several questionnaires in order to record a broad sample of clinical behavior. The respondents were told that the questionnaire was being conducted to ascertain the disease variables, characteristics, and measures currently used by practicing rheumatologists to assess disease activity in their patients with RA. Included in the surveys were questions regarding the respondent's use of objective and/or standardized DAM during an office visit with a patient with RA. None of the respondents to the surveys was aware of the hypothesis that the investigators were testing.

Group A rheumatologists attended a 1.5-day prototype for an educational program on DAM, held August 3-4, 2007, in Hauppauge, NY. The experts updated the participants on the DAM used in clinical trials and clinical practice, including information on the predictive ability of outcomes of standardized DAM and the benefits of using objective measures over nonobjective measures to assess patient disease outcomes. The group engaged in a tutorial on how to complete and use the RAPID as part of a clinical practice.

As incentives, members of Group NA received an honorarium for each completed survey. Members of Group A received an honorarium for their participation in the planning meeting and the prototype educational program, and for completing the surveys.

RESULTS

Fifty-two rheumatologists in clinical practice from across the US completed and returned 364 surveys to the investigators. Respondents completed and returned a total of 138 premeeting surveys (Survey 1) during a 5-month time period prior to the DAM meeting; of these, 70 were completed by "future" meeting attenders (Group A), and 68 by nonattenders (Group NA). After the DAM meeting, 226 post-meeting surveys (Survey 2) were returned beginning 2 months after the completion of the program; 105 were completed by Group A and 121 by Group NA.

Analysis of data collected from Survey 1 revealed that the rheumatologists in Group A and Group NA considered 16 variables at least 70% of the time when estimating disease activity in their patients with RA (Table 2). These frequently used variables included symptoms of the disease (pain, fatigue, and morning stiffness), signs (swollen joints, tender joints, non-joint physical examination), laboratory findings [erythrocyte sedimentation rate (ESR), C-reactive protein (CRP)], and overall physician's gestalt.

In Survey 1, the HAQ, a patient-driven DAM, was reported as the most frequently utilized standardized measure, used 34% of the time (Table 3). The remaining quantitative DAM [i.e., the modified HAQ (MHAQ), MDHAQ, GAS, RAPID, SDAI, CDAI, ACR score, or DAS] were reportedly used ≤ 11% of the time. In Survey 1, Group A rheumatologists reported the use of any patient-driven standardized DAM during 37 of the 70 (53%) RA patient encounters, whereas Group NA reported the use of a patient-driven standardized DAM during 30 of the 68 (44%) RA patient encounters. A t test to assess the difference between Group A and Group NA did not reach statistical significance ($p = 0.31$); hence, both groups appeared to be matched in their utilization of DAM prior to the DAM program (Figure 1).

Analysis of the data collected from Survey 2 conducted

Table 1. The disease activity measurement (DAM) questionnaire.

As you complete this survey, please recall the patient you just saw with rheumatoid arthritis. Place a check mark in the Yes or No column for each item you considered in judging this patient's disease activity	**Yes**	**No**
Number of swollen joints		
Number of tender joints		
Physician Global Assessment		
C-reactive protein (CRP)		
Erythrocyte sedimentation rate (ESR)		
Health Assessment Index (HAQ)		
Modified HAQ (MHAQ)		
Multidimensional Health Assessment Questionnaire (MDHAQ)		
Pain		
Patient Global Disease Activity		
Results of radiographs		
Ritchie Articular Index		
Patient Global Health Assessment		
Physician Global Disease Activity		
Rheumatoid Arthritis Disease Activity Index (RADAI)		
Fatigue		
Morning stiffness		
Patient change over time		
Disability status		
Meds		
Anxiety		
Depression		
Comorbidities		
Exercise habits		
Physical exam other than joint exam		
"How bad is your rheumatic condition based on your joints"		
Do you measure by "Gestalt"		
Is your approach to determining your "gestalt" the same for each patient		
Have you had joint surgery since your last visit		
Have you had a joint injected since your last visit		
Body posture/"language"		
Facial expression		
Magnetic resonance imaging (MRI)		
Ultrasound		
Range of motion		
Pain on range of motion (ROM)		
Warmth of joint		
Joint erythema		
Grip strength		
Muscle strength		
Muscle atrophy		
Deformity		
Irritability as indicator of pain		
Which aspects of mood/affect are important		
Do you record a numerical value for any variable		
Social history changes - family problems?		
Sexual activity		
Energy level		
Sleep interruption and habits		
Do you inquire about and consider over-the-counter drug use in assessing disease activity		
Global Arthritis Score (GAS)		
Simplified Disease Activity Index (S-DAI)		
Clinical Disease Activity Index (C-DAI)		
Disease Activity Score 28 (DAS28; either with ESR or CRP)		
American College of Rheumatology (ACR) score		
Routine Assessment of Patient Index Data (RAPID)		
Record anything else you observe or consider		

after the DAM meeting revealed that the rheumatologists in both Group A and Group NA considered overlapping sets of variables, symptoms, tests, or measures at least 70% of the time when estimating disease activity in their patients with RA after the meeting as they did before the meeting (Table 2). Of note, physician "gestalt" was reported to be used less than 70% of the time post-meeting but not pre-meeting.

In Group A on Survey 2, there was an increased use of

Table 2. Variables considered at least 70% of the time by rheumatologists as measured by Survey 1 and Survey 2 (Group A and Group NA combined). Results are ranked in order from highest percentage to lowest percentage.

Survey 1	Survey 2
1. Number of swollen joints	1. Morning stiffness
2. Number of tender joints	2. Number of tender joints
3. Morning stiffness	3. Pain
4. Medications	4. Medications
5. Pain	5. Number of swollen joints
6. Erythrocyte sedimentation rate	6. Erythrocyte sedimentation rate
7. Physician global assessment	7. Pain on range of motion
8. C-reactive protein	8. Warmth of joints
9. Fatigue	9. Patient change over time
10. Physical examination other than joint examination	10. Physician global assessment
11. Pain on range of motion	11. Fatigue
12. Warmth of joints	12. Physical examination other than joint examination
13. Comorbidities	13. Comorbidities
14. Patient "change" over time	14. C-reactive protein
15. Deformity	15. Joint erythema
16. Physician "gestalt"	16. Deformity

DAM measures, particularly the RAPID and MHAQ, following the DAM meeting (Table 3). Group A rheumatologists reported the use of a patient-driven standardized DAM during 83 of the 105 (79%) RA patient encounters, whereas Group NA reported the use of a patient-driven DAM during 49 of the 121 (41%) RA patient encounters (Figure 1). A t test to assess the difference between Group A and Group NA demonstrated a significant statistical difference between these groups ($p < 0.0001$). When compared pre- and post-intervention (Survey 1 vs Survey 2), Group A showed a statistically significant increase in DAM use post-intervention ($p < 0.0001$), whereas there was no difference in DAM use between the 2 surveys in Group NA ($p = 0.63$).

The RAPID was found to be infrequently used by both groups pre-intervention (Survey 1); the difference between the groups was not statistically significant ($p = 0.34$). Following the meeting, an increased number and percentage of physicians used the RAPID assessment in Group A (49 of 105 surveys, 47%) compared to Group NA (1 of 121 surveys, 0.8%; $p < 0.0001$). Following the intervention, in Group A, there was a significant increase in use of the RAPID following the meeting attendance (49 of 105 surveys, 47%) compared to pre-meeting (6%; $p < 0.0001$). There was no difference for Group NA between Survey 1 and Survey 2 ($p = 0.46$).

DISCUSSION

Previous reports have indicated that despite the value and ease of utilizing standardized DAM in clinical practice, very few rheumatologists had elected to utilize these measures. We report on the current level of utilization of patient-reported outcome-based DAM by rheumatologists, and on the other variables frequently utilized by practicing rheumatologists when assessing disease activity in treating their patients diagnosed with RA.

The surveys completed by rheumatologists from across the US indicated that during at least 70% of office visits with RA patients, rheumatologists are considering their patient's morning stiffness, number of tender joints, current medications, number of swollen joints, pain, ESR, pain on range of motion, warmth of joint, comorbidities, physical examination findings other than joints, joint erythema, CRP, fatigue, deformity, and patient change over time, when assessing disease activity. In addition, prior to execution of the DAM educational program, the rheumatologists indicated that during at least 70% of office visits with patients, they formulated a "physician global assessment" or "gestalt" in assessing disease activity in patients.

These findings were consistent with previously reported findings[1] that the utilization of standardized DAM had not been widely adopted by rheumatologists at the time of our first survey, with the HAQ used 33% of the time and the other measures considerably less. The results of the surveys also substantiated the investigators' assumption that practicing rheumatologists were acquiring much of the data needed for calculating a standardized DAM score.

These results validate the hypothesis that exposure to an educational program on DAM would result in an increased use by practicing rheumatologists of DAM if the rheumatologists were (1) presented with compelling data regarding the positive value of the measures, (2) shown the overlap between the data acquired to calculate a DAM and the data that they would ordinarily acquire during an office visit with an RA patient, (3) shown that only a small step would be required to utilize DAM in practice, (4) informed of the obstacles to and benefits for utilizing DAM, and (5) taught how to implement the measure quickly and easily via a tutorial.

Table 3. Consideration of disease variables by percentage of time assessed by rheumatologists, as measured by Survey 1 and Survey 2.

Disease Variable	Survey 1		Survey 2	
	Group A	Group NA	Group A	Group NA
Swollen joint count	96	99	78	94
Tender joint count	96	99	78	95
Morning stiffness	90	97	94	88
Medications	86	96	91	81
Pain	86	91	88	85
Erythrocyte sedimentation rate	83	90	77	87
Physician global assessment	67	96	68	89
C-reactive protein	80	79	75	73
Fatigue	76	79	77	76
Physical examination other than joint examination	74	78	78	72
Pain on range of motion	63	88	75	85
Warmth of joint	66	82	76	82
Comorbidities	67	76	85	64
Patient change over time	64	79	78	79
Deformity	71	71	78	62
Physician "gestalt"	73	68	80	53
Patient global disease activity	61	74	68	73
Joint erythema	64	71	72	75
Range of motion	57	71	64	69
Do you assess facial expression?	70	57	73	53
Energy	59	68	62	69
Do you record social history changes or family problems?	63	57	52	58
Do you inquire about and consider over-the-counter drug use in assessing disease activity?	67	49	53	60
Do you inquire about sleep interruption?	62	47	52	60
How bad is your rheumatic condition based on your joints?	43	60	62	63
Exercise habits	50	49	50	59
Do you record a numerical value for any variable?	60	37	76	41
Grip strength	30	65	36	63
Depression	39	65	41	52
Anxiety	37	54	30	49
Have you had a joint injected since your last visit?	50	37	52	36
Physician global disease activity	33	51	50	50
Patient global health assessment	33	50	52	73
Disability status	44	38	61	55
Muscle strength	31	50	46	44
Results of radiographs	36	43	37	63
Muscle atrophy	39	40	44	44
Have you had joint surgery since your last visit?	46	24	51	36
Health Assessment Questionnaire (HAQ)	33	36	28	21
Is your gestalt the same for each patient?	34	28	39	33
Which aspects of mood/affect are important?	19	24	22	33
Magnetic resonance imaging	19	15	15	19
Do you assess irritability as indicator of pain?	14	10	19	42
Modified HAQ	21	1	39	7
Do you inquire about sexual activity?	14	4	7	26
Rheumatoid Arthritis Disease Activity Index (RADAI)	6	12	10	11
Ultrasound	10	4	8	10
Routine Assessment of Patient Index Data (RAPID)	13	0	47	1
Multidimensional HAQ (MDHAQ) functional score	6	7	20	4
Disease Activity Score 28 (DAS28; with either ESR or CRP)	10	1	9	15
Ritchie Articular Index	3	7	3	8
American College of Rheumatology (ACR) score	7	0	5	12
Global Arthritis Score (GAS)	3	6	8	16
Record anything else you observe or consider?	1	3	20	22
Simplified Disease Activity Index (SDAI)	3	0	0	2
Clinical Disease Activity Index (CDAI)	0	0	0	0

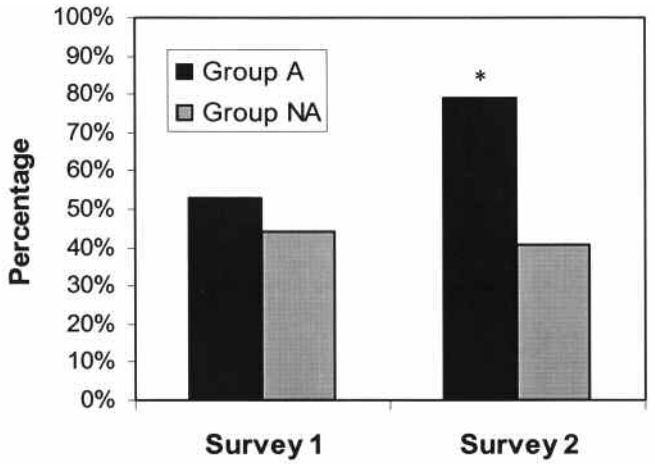

Figure 1. Percentage utilization of patient-driven standardized disease activity measurements of Group A (attenders to an educational seminar) and Group NA (nonattenders) as reported in Survey 1 and Survey 2. *$p < 0.0001$ for comparison between Survey 1 and Survey 2 for Group A, and between Group A and Group NA for Survey 2.

During the meeting, it was noted by the rheumatologists that they were already acquiring most of the disease activity measures required to calculate a RAPID, GAS, or CDAI score. Thus, it would only require a small step to go from being "gestaltists" to using a standardized tool. In addition, they noted the value of using measures predictive of disease outcome because now, with the advent of biologics, they had treatment options to turn to when disease activity was determined to be high.

After attending the DAM meeting, the attendees utilized significantly more patient-driven standardized DAM, including the RAPID, than the non-attender group, and significantly more than they themselves had utilized pre-meeting. These significant differences suggest that the DAM program had the hypothesized effect of influencing physician behavior. There was no statistically significant change in behavior on the part of the non-attender group between Survey 1 and Survey 2, further supporting the contention that exposure to the DAM program influenced physician behavior.

Several caveats are to be considered when interpreting the data. Importantly, the study relied on self-reported behavior that was not independently verified. It could be hypothesized that the DAM meeting attenders might be consciously or subconsciously more likely to report their use when responding to a questionnaire from the sponsors of the meeting, regardless of actual behavior. Further, the RAPID test was sent to Group A upon request but not to Group NA, which may have contributed to the significant differences in the use of this test post-meeting between the 2 groups.

The results of this initiative clearly suggest that a structured program about DAM could result in behavior change that could be measured 2 to 3 months after the completion of the program. Whether or not this effect could be replicated in other locations with other practicing rheumatologists remains to be demonstrated; the investigators are currently undertaking a continuing medical educational (CME) initiative targeted at 300 rheumatologists in clinical practice in 27 locations across the US, with the key elements of the 2007 program integrated into the educational activities.

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