

Smoldering Rheumatoid Arthritis: Is the Canadian Healthcare System Neglecting a Significant Disease Population?

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ABSTRACT. Objective. To investigate rheumatology practice in Canada with regard to evaluating disease activity status and treatment regimens in patients with rheumatoid arthritis (RA). It was hypothesized that patients with “smoldering” disease activity were not being adequately treated.

Methods. Rheumatologists were invited to participate by the Canadian Rheumatology Association in an audit entitled the Assessment in Rheumatology (AIR) program. From across Canada, 65 rheumatologists participated. One thousand five hundred ninety-six consecutive patients with RA seen in regular clinics were classified according to 4 states of disease activity: remission, controlled adequately, smoldering, and uncontrolled. Demographics (age, sex, geographic region), therapy (nonsteroidal antiinflammatory drugs, disease modifying antirheumatic drugs, biologicals, steroids), joint counts (tender/swollen), comorbidity, and treatment decisions at the time of the visit were recorded. Data were collected at the time of the visit with personal digital assistants (PDA) and aggregated, without personal identifiers, for analysis in SPSS.

Results. The majority of patients had “smoldering” (29%) or “uncontrolled” disease (23%), with the remainder in “remission” (15%) or “controlled adequately” (33%) at the time of their visit. Following the appointment, the uncontrolled group had a 100% increase (from 10.4% to 23.4%) in the addition of biological agents; however, there was no significant increase in the rates for those with smoldering disease (19.4% to 20.5%).

Conclusion. Despite Canada’s universal healthcare system, current treatment regimens may not be optimized on the basis of disease activity. A large proportion of patients with RA (29%) seen in Canadian rheumatology practices may be experiencing unnecessary disease for a variety of reasons. (First Release June 15 2008; J Rheumatol 2008;35:1506–12)

Key Indexing Terms:

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Rheumatoid arthritis (RA) is an autoimmune disease affecting 1% of Canadians¹. RA causes joint inflammation leading to deformity and disability². Patients with RA are challenged with increased functional disability and mortality^{3,4}. If inadequately controlled, the disease puts a high economic

burden on the patient and the healthcare system⁵⁻⁷. Over the past 15 years, there have been significant advances in the field of rheumatology with the introduction of more effective treatments, including biological agents, and of more aggressive objectives for therapy. RA disease control and even remission are becoming more realistic treatment goals.

In the spring of 2005, a group of Canadian rheumatologists raised the question: How well were they managing their patients with RA? They were concerned they were not adequately treating a significant number of their RA patients with “smoldering” disease activity. An audit, the Assessment in Rheumatology (AIR) program, was initiated with the goal of evaluating disease activity status and treatment regimens of patients with RA followed in rheumatology clinics across Canada. Patients were classified into 4 disease states: remission, controlled, smoldering, and active. The classification was based on the number of joint areas with swollen and tender joints, duration of morning stiffness, energy level, and erythrocyte sedimentation rate (ESR). Rheumatologists recorded treatment decisions, joint

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counts, and comorbidities in an effort to elucidate what was occurring in the examining room in their practice.

MATERIALS AND METHODS

A group of 9 rheumatologists from across Canada participated in several facilitated teleconferences to develop the program guidelines and refine what information would be collected. Disease classification criteria were defined that included 4 disease states: remission, controlled, smoldering, and active (Table 1). The Disease State Criteria, agreed to by the coordinating committee of the study, satisfied the need for a rapidly applied assessment in a busy clinic based on the expert opinion of the practicing rheumatologist, without utilization of laboratory measures such as the ESR. Participating physicians were made aware of criteria but asked to use their expert judgment when classifying patients. This was done in an effort to prevent bias and observe what physicians were doing in their everyday practice. Validation of the data collection process was undertaken with a test set of assessments by several rheumatologists prior to the initiation of the formal clinical review process. Ambiguities with questions, difficulties with data entry, and general flow of the assessments were identified and dealt with before engaging the practicing rheumatologists in the practice review.

Practicing rheumatologists across all regions of Canada were invited by the Canadian Rheumatology Association (CRA) to participate in the AIR program. Before they could start entering patients, participants were asked to answer questions pertaining to their practice. These questions included information on geographic location, drawing area, how long they had been in practice, group or solo association, academic affiliation, and ability to supervise students and fellows. Rheumatologists were then given an identification number and password that enabled them to access a national Website. The Website allowed the rheumatologists to review how they were practicing and how they compared to their fellow Canadian rheumatologists. The Royal College of Physicians and Surgeons granted credits to participating rheumatologists for time spent reviewing their practice.

Personal identifiers were not used while recording information. Data were collected over a period of 4 consecutive weeks. National pooling of data was done by a third party, ISIS Digital. Data were analyzed with SPSS.

RESULTS

Participating rheumatologists. Of the 250 rheumatologists from across Canada invited by the CRA to join the AIR program, 65 agreed to participate in our study. Physician demographics are listed in Table 2. The demographic details of the 185 who declined participation were not obtained. An estimate of their general measures based on the existing CRA membership database is provided at the bottom of Table 2. The majority of participating physicians were from eastern Canada and tended to practice in large cities. Only 3 rheumatologists practiced in rural settings. Private fulltime practice (n = 35) was more common than university (n = 19) and part-time university and private practice (n = 11). Solo

Table 2. Participating physician demographics*.

Male	43
Female	22
Location	
Urban	62
Rural	3
Drawing area	
> 1 million	23
500,000–999,999	11
250,000–499,999	14
100,000–249,999	13
50,000–99,999	4
Type of practice	
Private practice full-time	35
University practice full-time	19
Part time university and private practice	11
Solo or group association	
Solo	38
Group	27
Years in practice	
< 5	10
6–20	35
> 20	20

* June 2006, 408 rheumatologists were registered with the CRA. Of those, 64.5% are male, 75% practice in urban settings 28.4% are full-time university, 71.6% private practice, and 30% solo practice. CRA: Canadian Rheumatology Association.

association was more frequent (n = 38) than group association (n = 27). Surprisingly, 18.5% (n = 12) did not have support staff (secretary, clerk, or nurse) associated with their practice. Almost half (n = 31) were able to supervise rheumatology fellows and the majority (n = 43) could supervise medical and surgical residents. Participating rheumatologists were highly experienced; 65.7% had been in practice for more than 10 years.

Patient demographics. Over the 1-month recording period, 1596 consecutive patients with RA were seen in rheumatology clinics across Canada. The mean age of patients was 58.4 years (\pm 14.2). As expected, the majority of patients with RA were female (73.4%). Disease duration was classified into 5 groups: (1) less than 12 months (n = 97), (2) 1–2 years (n = 210), (3) 3–10 years (n = 658), (4) 11–15 years (n = 54), and (5) greater than 15 years (n = 410). At the visit, patients were classified into 4 disease states, as defined above. The majority of patients were either “smoldering” (28.7%) or “uncontrolled” (23.0%), with the remainder in

Table 1. Disease state criteria.

Disease State	Criteria
Remission	No evidence of disease activity (such as morning stiffness, decreased energy or active joints)
Controlled	1–2 active joints*, with no morning stiffness or decreased energy
Smoldering	3–4 active joints*, with increased morning stiffness, decreased energy or elevated ESR
Active	> 4 active joints*, morning stiffness and decreased energy or elevated ESR

* A swollen or tender joint was considered active. ESR: erythrocyte sedimentation rate.

“remission” (15.3%) or “controlled adequately” (33.0%) at the time of their visit. Joint counts alone explained 52.0% of the variance ($p < 0.0001$) in disease states. Patient demographics and mean active joint count are listed in Table 3. As other aspects than activity of joints were considered in the classification, means of regions of active joints were lower than the numbers required for classification in the controlled and smoldering disease states.

Patients had previously been seen by their rheumatologist within 2 months in 32.2%, 3–4 months in 30.1%, 5–12 months in 28.1%, and over 12 months in 3.9% of the encounters. The visits typically lasted 10–30 min ($n = 1374$) with followup appointments most commonly booked for 3–4 months ($n = 586$). For each patient visit, rheumatologists recorded the assessments performed. Patient visits almost always included a history of present complaint (99.4%), examination (84.5%), and joint count (86.5%). Laboratory tests (ESR and C-reactive protein), MD and patient global pain assessment, pain visual analog scale, and Health Assessment Questionnaire were also frequently used (Table 4).

Current treatment at time of appointment. Of the 1596 patients reviewed, 1555 (97.43%) were currently taking a RA therapeutic. Rheumatologists recorded the patients’ current medications, treatment decisions, and medication changes. These medications include disease modifying antirheumatic drugs (DMARD), steroids, biologics, and nonsteroidal antiinflammatory drugs (NSAID). Tables 5A–5D list medication use by disease state.

Patient treatment changes. At the time of the appointment, more than half ($n = 841$, 52.7%) of the patients did not have their RA disease therapy changed. The frequency of changes in management correlated with the level of disease activity. Percent therapy change was 22.5% for those in remission, 26.6% for controlled disease, 56.1% for smoldering disease, and 82.6% for those with active disease. Of the 755 patients that did have a change in their management, 749 had a dosage increase or change in medications and 6 were removed from treatment. Methotrexate (MTX) dose was increased in 239 patients, with active patients contributing most significantly to this number ($n = 132$). Thirty-one patients were switched from oral MTX to subcutaneous (sc) MTX. Biologics were prescribed for 62 patients and 13 patients were taken off biolog-

Table 4. Assessment at appointment.

At Appointment	% (n of Patients)
History of present complaint	99.4 (1586)
Examination	84.5 (1349)
Joint count	86.5 (1380)
HAQ	23.4 (373)
DAS	7.9 (126)
Pain VAS	22.6 (360)
Disease activity VAS	13.7 (218)
MD global pain assessment	29.7 (474)
Patient global pain assessment	29.4 (470)
Laboratory test: ESR/CRP	66.5 (1061)
Radiography	17.5 (279)
MRI	0.2 (3)
Ultrasound	0.3 (5)

HAQ: Health Assessment Questionnaire; DAS: Disease Activity Score; VAS: visual analog scale; ESR: erythrocyte sedimentation rate; CRP: C-reactive protein; MRI: magnetic resonance imaging.

ics. Thirty-seven patients were prescribed prednisone or had their doses of prednisone increased (2.3%). However, 80 patients were taken off prednisone or had their dose decreased.

Rheumatologists were required to select a reason for no change in therapy as part of the study. The 2 choices given when a rheumatologist selected no changes to therapy were either that it was not necessary or it was not possible to change. Physicians could then identify one or more reasons for their decision. (Note: Percentages do not add to 100 as in some cases physicians selected multiple reasons for their decision.) When it was not necessary, reasons given were: patient disease activity is acceptable/controlled (59.9%), remission (no disease activity) (27.0%), patient is improving (9.6%), and not enough time has passed to evaluate the current effort (6.9%). The rationale that it was not possible to change was used less frequently. Reasons given in that situation were: all options exhausted (15.6%), maximum tolerable therapy reached (17.2%), at maximum allowable dose according to risk/benefit ratio (4.9%), surgery expected soon (7.4%), and acute interfering disease — infectious (7.4%), toxicity (4.9%) and other (19.7%). Patient preference had a significant influence on the decision to change management. Rheumatologists listed patient preference as the reason it was not possible to change management in 68 cases (55.7%).

Table 3. Patient demographics and classification.

	Remission	Controlled	Smoldering	Active
Age	59.5 ± 13.7	59.5 ± 13.7	59.5 ± 13.6	54.8 ± 15.2
Sex, female (%)	70.9	74.2	72.7	74.7
No. of patients	244	527	458	367
Active joint regions*	0.23 ± 0.61	0.94 ± 1.04	2.50 ± 1.48	4.50 ± 1.96

* Data collection only allowed physicians to indicate if a particular joint region was swollen or tender. An active joint region means that at least one joint within a joint region (e.g., metacarpophalangeal joint) was active (swollen or tender) at the time of examination.

Table 5a. RA medications: DMARD. % (n of patients).

	Remission	Controlled	Smoldering	Active	Total
Methotrexate (oral or sc), mg	59.4 (145)	69.4 (366)	69.0 (316)	62.1 (228)	66.1 (1055)
5–7.5	6.1 (15)	4.2 (22)	3.5 (16)	1.9 (7)	37.6 (60)
10–15	25.8 (63)	30.0 (158)	27.9 (128)	21.8 (80)	26.9 (429)
17.5–20	15.9 (39)	23.9 (126)	22.5 (103)	19.9 (73)	21.4 (341)
22.5–25	11.1 (27)	10.8 (57)	14.4 (66)	17.7 (65)	13.5 (215)
> 25	0.4 (1)	0.6 (3)	0.7 (3)	0.8 (3)	6.3 (10)
Salazopyrin	6.1 (15)	7.4 (39)	10.9 (50)	12.8 (47)	9.5 (151)
Antimalarials	41.4 (101)	33.8 (178)	33.0 (151)	31.1 (114)	34.1 (544)
Immunosuppressive	0.8 (2)	2.7 (14)	2.8 (13)	3.5 (13)	2.6 (42)
Leflunomide	3.7 (9)	7.2 (38)	12.9 (59)	12.3 (45)	9.5 (151)
Auranofin, minocycline, penicillamine, or gold	5.3 (13)	3.6 (19)	4.1 (19)	4.6 (17)	4.3 (68)

DMARD: disease modifying antirheumatic drugs.

Table 5b. RA medications: Biologics. % (n of patients).

	Remission	Controlled	Smoldering	Active	Total
Biologics	12.3 (30)	20.1 (106)	20.5 (94)	23.4 (86)	19.8 (316)
Infliximab	2.5 (6)	5.1 (27)	6.3 (29)	6.0 (22)	5.3 (84)
Etanercept	7.8 (19)	12.0 (63)	10.5 (48)	11.2 (41)	10.7 (171)
Adalimumab	2.0 (5)	2.8 (15)	3.5 (16)	6.3 (23)	3.7 (59)
Anakinra		0.2 (1)	0.2 (1)		0.1 (2)

Table 5c. RA medications: Steroids. % (n of patients).

	Remission	Controlled	Smoldering	Active	Total
Prednisone	12.3 (30)	25.8 (136)	33.8 (155)	44.1 (162)	30.3 (483)
Low-dose	7.0 (17)	13.3 (70)	11.1 (51)	8.7 (32)	10.7 (170)
5–10 mg	5.3 (13)	12.0 (63)	20.7 (95)	25.9 (95)	16.7 (266)
11–25 mg		0.6 (3)	1.5 (7)	8.2 (30)	2.5 (40)
> 25 mg			0.4 (2)	1.4 (5)	0.4 (7)
Intramuscular		0.2 (1)	2.0 (9)	4.1 (15)	1.6 (25)
Intraarticular	1.2 (3)	4.4 (23)	10.3 (47)	8.2 (30)	6.5 (103)

Table 5d. RA medications: NSAID and other. % (n of patients).

	Remission,	Controlled	Smoldering	Active	Total
NSAID	42.2 (103)	59.6 (314)	59.6 (273)	64.6 (237)	58.1 (927)
Traditional	23.0 (56)	39.1 (206)	36.7 (168)	46.3 (170)	37.6 (600)
Coxibs	18.9 (46)	20.5 (108)	22.1 (101)	18.0 (66)	20.1 (321)
Topical	0.4 (1)		0.9 (4)	0.3 (1)	0.4 (6)
Analgesics	11.9 (29)	19.9 (105)	21.8 (100)	24.0 (88)	20.2 (322)
Bisphosphonates	86.5 (211)	76.5 (403)	73.1 (335)	77.9 (286)	77.3 (1235)
Other		0.4 (2)	0.4 (2)	1.1 (4)	0.5 (8)
Investigational	7.8 (19)	8.0 (42)	7.6 (35)	9.3 (34)	8.1 (130)

NSAID: nonsteroidal antiinflammatory drugs.

Treatment changes occurred in the remaining 47.3% (n = 755) of patients. Changes to therapy included increasing or decreasing dose, adding medications, and stopping medications. Changes were classified into 2 categories: necessary according to the rheumatologists and patients' preference. Rheumatologists deemed it necessary to change treatment because of adverse events on current medication (12.5%), disease activity not controlled to their satisfaction (54.6%), activity is increasing (18.5%), and presence of regional pain (7.4%). In 118 cases, the patient's disease activity was considered to be controlled and the medication was reduced. Patient preference was given as the reason for a change when patients refused to continue (0.8%), requested a change (7.7%), and when financial restrictions were an issue (0.8%).

Comorbidities and comorbid medications. Over half (53.9%, n = 861) of patients seen had at least 1 comorbidity. The most prevalent comorbidities were hypertension, osteoporosis, heart disease, and depression (Table 6). These patients are difficult to manage as 34.0% (n = 543) had 1–2 comorbidities, and 19.9% (n = 318) had 3 or more. Polypharmacy was quite frequent among the 1596 patients investigated, as 69.3% (n = 1106) were taking at least one medication for a comorbidity. Thirty-two percent of patients (n = 510) were taking more than 1 comorbid medication and 37.3% (n = 596) were taking 3 or more. The more common reasons for use of comorbid medications were cardiac, 56.2% (n = 897), and gastrointestinal, 21.8% (n = 348).

Table 6. Comorbidities and medications (not for RA).

	% (n of patients)
Comorbidity	53.8 (861)
Hypertension	23.7 (379)
Diabetes	5.8 (92)
Gastrointestinal	10.2 (163)
Hypothyroidism	6.0 (95)
Heart disease (CHF, angina, MI, stroke)	11.0 (175)
Sjögren's syndrome	2.2 (35)
Depression	8.0 (128)
Osteoporosis	12.2 (195)
Osteoarthritis	7.1 (113)
Other	44.3 (707)
1–2 comorbidities	34.0 (543)
> 3 comorbidities	19.9 (318)
Medications (not RA)	69.3 (1106)
Cardiac (lipid lowering, cardiac, and antihypertensive)	56.2 (897)
GI (PPI)	21.8 (348)
Diabetic	6.0 (95)
Amitriptyline or SSRI	10.3 (165)
Birth control	2.1 (33)
Alternative therapy	2.5 (40)
Other	25.9 (414)
1–2 medications	32.0 (510)
> 3 medications	37.3 (596)

RA: rheumatoid arthritis; CHF: congestive heart failure; MI: myocardial infarction; PPI: proton pump inhibitors; SSRI: selective serotonin reuptake inhibitors.

Patients with smoldering RA. Patients with smoldering RA had disease activity present, however, at a lower level than active patients. These patients represented 28.7% of all patients with RA seen in rheumatology clinics. The information collected on treatment regimens for patients with smoldering RA was concerning. Even with disease activity evident, these patients' therapy was unchanged 43.9% of the time, as compared to only 13.8% in the active patient group. Single-DMARD therapy was used in 48.7% of patients with smoldering RA, double therapy in 39.7%, triple therapy in 8.1%, and 3.3% were not taking any DMARD. While 69.0% of 458 patients with smoldering disease were prescribed MTX, 86.7% of these were receiving a dose less than 25 mg (oral or SC). After the visit, the number of "smoldering" patients prescribed MTX increased by 64 (14.0%), as compared with an increase of 93 (36.8%) in the "active" group. A greater number of patients were switched from oral MTX to sc MTX in the active group (n = 21) than in the smoldering group (n = 10).

At the time of the appointment, 33.8% of patients with smoldering RA were prescribed prednisone. Of those prescriptions, 9.0% were for less than 5 mg (qd), 20.7% were for 5–10 mg (qd), 1.5% were for 11–25 mg (qd), and 0.4% of patients were prescribed more than 25 mg. In the "active" disease patient group, 44.1% of patients were given prednisone. During the visit, prednisone was added or increased for 34 patients and removed or decreased for 9 patients. In comparison, in the "smoldering" group only 3 patients were given prednisone or had their dosage increased and 20 were removed or had their dosage decreased.

Following the appointment, the active group had a 100% increase (from 10.4% to 23.4%) in the prescription of biological agents. In contrast, there was no significant increase in the rates of biological treatment for those with smoldering disease (19.4% to 20.5%).

Rheumatologists did not feel a change was necessary in 29.5% of the patients with smoldering RA. When no changes were made, the patient with smoldering disease's current therapy was considered acceptable in 66.7% of cases. Other reasons not to change were "not enough time to evaluate current effort" (19.3%) and "patient is improving with current therapy" (18.5%). For 1.5% of smoldering RA patients with obvious evidence of persistent disease, therapy went unchanged because the rheumatologist believed the patients had no more disease activity.

When a change in therapy was not made, it was not considered possible for 51.9% of patients with smoldering RA. The largest contributing factor to this decision was patient preference. When the patient preferred not to change therapy, over half of patients (61.4%) did not see the value in increased intervention. Other reasons indicated by rheumatologists who felt it was not possible to change therapy included patient at maximum tolerated dose (22.9%), patient at maximum allowable dose using the risk/benefit ratio

(5.7%), all options exhausted (18.6%), surgery expected shortly (7.1%), acute interfering disease (infections) present (5.7%), toxicity (4.3%), and other reasons (10.0%).

DISCUSSION

The observation that there were no changes made to medications during followup appointments in 44% of patients with smoldering RA was startling. It confirms our hypothesis that patients with smoldering disease are not adequately treated. There were 3 significant justifications for these patients falling through the cracks: (1) physician management, (2) patient preferences, and (3) access to biological therapies.

Our data suggest that Canadian rheumatologists are not treating patients with smoldering RA aggressively enough. Even though disease activity was clearly present, rheumatologists changed therapy in only 56.1% of patients with smoldering disease, in comparison with 82.6% of those with active disease. When changes to therapy in patients with smoldering RA were not made, 71% of the time it was because rheumatologists felt such changes were not necessary. Several studies have demonstrated that tight control of RA disease activity benefits the patient^{8,9}. Rheumatologists stated it was not possible to change therapy because therapy was maximal in only 10% of cases. Although 98.5% of the 458 patients with smoldering disease were receiving some RA therapeutics, in most cases the dosage and combinations of the drugs used were not optimal. For example, 88.7% of patients with smoldering RA receiving MTX were taking a dose less than 25 mg (sc or oral). Similarly, MTX was administered sc in only 72 cases (22.8% of patients taking MTX). The bioavailability and efficacy of MTX are known to be higher when administered sc than when given orally¹⁰. Studies have also shown that a triple combination therapy using MTX, sulfasalazine, and hydroxychloroquine is more effective in the treatment of RA than single-DMARD therapy¹¹. While 91.8% of patients with smoldering RA were taking a DMARD, 46.0% were still receiving single-DMARD therapy. It is interesting to note that a fair number of patients were treated with “investigational drugs” (n = 130), suggesting more aggressive therapy.

These are complex patients who require comprehensive management, and physicians are limited in the amount of time they can spend with a patient. With the constraints on their time, rheumatologists need to look to novel models of care to better utilize that time. Models using nurse specialists in established RA followup clinics have been shown to be successful and could serve to alleviate some of the burden of care from the rheumatologist¹². This would allow the rheumatologist to concentrate more on active disease management as opposed to routine followup care. It is interesting that in the group of participating rheumatologists 18.5% did not have any support staff.

It was surprising to discover that patient preference

markedly limited the management of RA. When treatment was not changed for patients with smoldering disease, in 43% of cases it was because the patients refused. Whether this was from concerns about side effects, costs, lack of education, or other reasons is unclear. It has been suggested that the rheumatologist and the patient develop a longterm treatment plan to increase self-efficacy and communication². High patient self-efficacy has been shown to relate to improved health status^{13,14}. A longterm treatment plan would allow the patient to prepare for future changes in their disease management and be more proactive about their care. Educating patients about RA has been shown to improve health status in patients with RA^{15,16}. Patients need to be empowered to request changes in their RA therapy.

The newer biologic treatments have been shown to be effective for the treatment of RA. Only 5 patients with smoldering disease were prescribed a biologic agent at their rheumatologist visit, compared to 18 patients with active disease. The number of patients with active and smoldering disease receiving a biologic was relatively low, about 20%. While the Canadian healthcare system is meant to be universal, the coverage and access to biological agents varies across Canada. Recently, biologic agents have been included in provincial formularies. Due to the high cost of these agents, the provinces have implemented strict criteria eligibility. In most provinces, patients must have specified scores on standardized instruments such as the HAQ and Disease Activity Score 28 Joint Count (DAS28) and have failed DMARD therapy. The provinces determine efficacy and need when considering eligibility requirements. Frequently, the province's fiscal state influences this decision, as the cost of biologics is high. For example, when considering date of release and access rules, Quebec residents have the easiest access to biologics, while residents of Prince Edward Island have the least access. How much these limitations to access affected the low rate of prescription of biologics to patients with active and smoldering RA remains to be defined.

The determination of disease state was a clinical judgment that did not rely on standard disease activity measures such as the DAS28. Research assistants were not available, and as the study illustrated, many of the rheumatologists practice without the benefit of support staff. The assessment was done during the clinic visit and without the benefit of a sedimentation rate that might be ordered, but not available. Rather than rely on the American College of Rheumatology (ACR) binary division of remission or not, it was decided to separate disease state into 4 monotonically increasing states of activity — remission, controlled, smoldering, and active. The DAS28 and other complex disease activity measures were deemed too difficult to apply in a busy practice. The ACR 20%, 50%, and 70% response are useful for changes over time, but these assessments were determined at a single clinic visit, without reference to previous disease activity¹⁷.

A caveat of our study was the data collection method for swollen and tender joint counts. Of the 1596 patients evaluated, rheumatologists performed a joint count on 1490. Data collection was based on joint area and included all the joints in that region on both sides of the body. For example, if one or more metacarpophalangeal (MCP) joints were swollen, the rheumatologist checked off "MCP swollen" and this was given a value of 1. There is no way to determine how many MCP were swollen or tender or on which hand. While the joint count criteria to distinguish between controlled, smoldering, and active disease may seem low, one has to consider that there could be anywhere from 1 to 10 joints swollen when the rheumatologist selected one joint area with swollen or tender joints. Thus, the means for active joint regions may in fact indicate much larger numbers of active joints than what would appear from the classification criteria in Table 1.

While the results of the audit may appear surprising, they are no different from those found with groups of rheumatologists in other countries. A study of French rheumatologists revealed that when patients with persistent moderate disease activity presented in followup appointments, rheumatologists did not change therapy in 72% of cases¹⁸. Some rheumatologists seem hesitant to change therapy even in the face of persistent disease activity. They may benefit from further consensus building, among their peers, on the need for aggressive treatment changes in situations such as smoldering disease. The CRA position paper on the treatment of RA with biologics states that adequate treatment should improve signs, symptoms, physical function, and quality of life and arrest joint damage¹⁹. The data from the audit suggest that this goal of adequate treatment is not being met. However, it is important to recognize that patients with RA are complex and frequently have multiple comorbidities that need to be considered during management. In addition, patients often (24.7%) need forms filled out at the time of the visit, which erode the visit time. Further studies into developing RA "best practices" could help to better guide rheumatologists in treating patients and encourage more aggressive therapy.

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