

# Are rheumatologists' treatment decisions influenced by patients' age?

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**Objectives.** The objective of this study was to determine whether physicians' treatment preferences are influenced by patients' age.

**Methods.** We mailed a survey to a random sample of rheumatologists practicing in the US. The survey included a scenario describing a hypothetical patient with rheumatoid arthritis (RA) on hydroxychloroquine, sulfasalazine and low-dose prednisolone, who presents with active disease during a follow-up appointment. The scenario was formulated in two versions that were identical except for the age of the patient. After reading the scenario, respondents were asked to rate (on a 10 cm numerical rating scale) their recommendations for each of the three options: (i) increasing the dose of prednisolone, (ii) adding a new disease-modifying anti-rheumatic drug (DMARD) and (iii) switching DMARDs. Rheumatologists who rated either adding a new DMARD or switching DMARDs higher than increasing the dose of prednisolone were classified as 'preferring aggressive treatment with DMARDs', while the others were classified as 'NOT preferring aggressive treatment with DMARDs'.

**Results.** A total of 480 rheumatologists were mailed a questionnaire; 204 responded, giving a response rate of 42.5%. Overall 163 (80%) respondents were classified as preferring aggressive treatment with DMARDs. Rheumatologists responding to this survey were more likely to prefer aggressive DMARD treatment for the young RA patient vs the older RA patient (87 vs 71%,  $P=0.007$ ).

**Conclusions.** Our findings suggest that rheumatologists' treatment recommendations may be influenced by age. Future educational efforts should increase physician awareness of this possible bias in order to ensure equal service delivery across ages.

KEY WORDS: Rheumatoid arthritis, Disease-modifying anti-rheumatic drugs, Decision-making.

Current treatment guidelines for patients with rheumatoid arthritis (RA) emphasize the need for aggressive management of active disease with one or more disease-modifying anti-rheumatic drugs (DMARDs) [1]. This recommendation is based on a body of literature demonstrating that aggressive treatment is associated with better long-term outcomes [1]. There is no evidence that the overall benefits of DMARD therapy are related to patients' age. Yet, a large, population-based study found that the time to initiate DMARD therapy was longer, and the number of DMARDs received was less for older vs younger patients [2]. Similarly, Tuntucu *et al.* [3] recently found that older RA patients with disease onset after 60 yrs receive biological therapy and combination therapy less frequently than patients with disease onset between ages 40 and 60 yrs ( $P < 0.0001$ ). A small, single-site study, however, found no differences in types of DMARDs used across age groups [4].

Lower utilization of DMARD therapy among older patients may be due to patients' and/or physicians' treatment preferences. Regarding the former, older patients may be more risk averse and less willing to accept the risk of drug toxicity compared with younger patients. Patients' perceptions of physicians' treatment recommendations have also been shown to differ with age, and may help explain why older patients receive less aggressive care [5]. Alternatively, differences in the use of DMARDs across age groups may be due, in part, to age bias.

Age bias refers to the observation that older patients are not as likely to receive medical interventions as younger patients with

comparable disease severity. This discrepancy in the delivery of healthcare has been demonstrated in diverse areas including oncology [6, 7] and cardiovascular disease [8, 9], but has not been well studied in RA. Given this background, the objective of this study was to determine whether, after controlling for other patient-related factors, rheumatologists' treatment preferences are influenced by age. We chose to examine the influence of patients' age on physicians' practices using standardized scenarios because this method provides a controlled experimental setting in which we were able to manipulate the variable of interest (i.e. age) while controlling for other important confounders.

## Methods

### Survey

We mailed a survey to a random sample of rheumatologists practicing adult rheumatology in the US. The random sample was obtained by assigning a number to consecutive rheumatologists practicing adult rheumatology listed in the American College of Rheumatology Directory. From this list, a random sample was obtained using a random number table. The survey consisted of a scenario describing a hypothetical patient with RA on hydroxychloroquine, sulfasalazine and low-dose prednisolone, who presents with active disease during a follow-up appointment. The scenario was formulated in two versions that were identical

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Submitted 3 January 2006; revised version accepted 23 March 2006.

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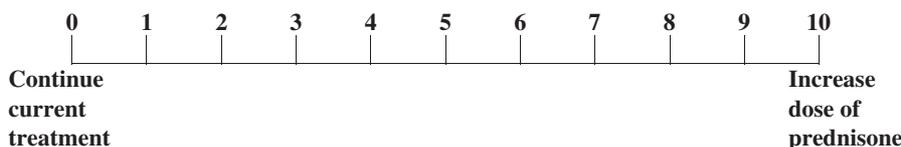


FIG. 1. Example of rating scale used.

except for the age of the patient. Each rheumatologist was mailed one version of the scenario. Scenarios were classified by version (i.e. young vs older RA patient), and assignment of scenarios was determined using a computer-generated randomization sequence (Microsoft® Excel 2002).

Half the respondents received a scenario containing the following information:

‘Mr. T is an 82-yr old man with rheumatoid factor-positive RA diagnosed approximately 15 months ago. His disease has been well controlled with low dose prednisolone and the combination of hydroxychloroquine and sulfasalazine (2 g BID) [10]. He does not take NSAIDs because they upset his stomach. Today, during a routine follow-up visit, he complains of increased pain in his finger joints. The review of symptoms is otherwise negative apart from increased morning stiffness lasting up to 1.5 hours (baseline = 20–30 minutes). General physical examination is unremarkable except for moderate synovitis involving the 2nd and 3rd MCPs (metacarpophalangeal joints) bilaterally. Lab tests from this morning: normal CBC, SMA<sub>7</sub>, LFT, TSH, ESR = 45.’

The remaining rheumatologists received the same scenario except that the patient’s age was 28 yrs. Photographs of an older adult and young man sitting with the same physician were inserted into the old- and young-patient scenarios, respectively.

After reading the scenario, respondents were asked to rate (on a 10 cm numerical rating scale [11]) their recommendations for each of the three options: (i) increasing the dose of prednisolone, (ii) adding a new DMARD, and (iii) switching DMARDs. An example of the scale used is provided in Fig. 1.

Respondents were also asked to indicate the number of years in practice their gender, their type of practice and how they spend the majority of their time. No reminders were sent, and each rheumatologist received only one mailing. Surveys were returned anonymously in pre-addressed, stamped envelopes.

### Statistical analyses

We used descriptive statistics to describe the physicians’ characteristics. Median values and ranges are presented because the distributions of preferences were not normally distributed. Rheumatologists who rated either adding a new DMARD or switching DMARDs higher than increasing the dose of prednisolone were classified as ‘preferring aggressive treatment with DMARDs’, while the others were classified as ‘NOT preferring aggressive treatment with DMARDs’. The association of treatment preference with age was ascertained using the chi-square statistic. We also examined the association of treatment preference with physicians’ characteristics using the chi-square statistic and the Mann–Whitney test for categorical and non-parametric data, respectively. Multi-variate analyses were subsequently performed using multiple logistic regression. This protocol was approved by the Human Investigations Committee at our institution.

### Results

A total of 480 rheumatologists were mailed a questionnaire; 204 responded, giving a response rate of 42.5%. Ninety-one scenarios describing the older patient and 113 scenarios describing the younger patient were returned. About 74% of the respondents were male; 84% spent the majority of their time in adult patient

TABLE 1. Demographic characteristics of study sample vs larger survey of US rheumatologists

Characteristic	Age bias survey	Biologic drug use survey [12]
Male (%)	74	72
Academic-based (%)	20	36
Number of years in practice (%)		
0–10	26	29
11–20	34	33
>20	40	38

care, 20% were based at academic centers, and the median number of years in practice was 18 (range 2–53). Because questionnaires were returned anonymously, we do not have any information on the non-responders. However, a comparison of the demographic characteristics of this study sample with that of a larger recently published survey on biological drug use in RA [12] is provided in Table 1.

The median (interquartile range) willingness to increase the dose of prednisolone was 2 (0–7), to prescribe an additional DMARD was 5 (0–9) and to switch DMARDs was 6 (1–9). Overall, 163 (80%) of respondents were classified as preferring aggressive treatment with DMARDs.

In bivariate analyses, rheumatologists responding to this survey were more likely to prefer aggressive DMARD treatment for the young vs old RA patient (87 vs 71%,  $P=0.007$ ). In addition to patients’ age, physician gender and number of years in practice were also associated with preference for aggressive therapy in bivariate analyses. About 94% ( $n=50$ ) of the female rheumatologists preferred aggressive DMARD treatment compared with 74% ( $n=109$ ) of the male physicians ( $P=0.002$ ). The median number of years in practice was less among physicians preferring aggressive DMARD therapy compared with those not preferring aggressive therapy (17 vs 23 yrs,  $P<0.05$ ).

In a logistic regression model evaluating the preceding covariates (patients’ age, physician gender and number of years in practice), patient’s age [adjusted odds ratio (95% confidence interval) = 3.0 (1.4–6.2)] and physician gender [adjusted odds ratio (95% confidence interval) = 5.4 (1.5–19.2)] remained associated with preference for aggressive DMARD therapy.

### Discussion

In this study, we found that rheumatologists were more likely to recommend aggressive treatment for a young RA patient compared with an older RA patient with the same disease activity and comorbidities. These results may help explain why Kremers *et al.* [2] and Tuntucu *et al.* [3] found that older adults with RA were less aggressively treated compared with their younger counterparts. Our results also suggest that age bias may be stronger among male physicians. This finding is consistent with some studies demonstrating that women tend to have fewer systematic biases towards the elderly than do men [13]. As in a study by Gruppen *et al.* [14], we also found that younger physicians were more likely to favour ‘aggressive’ treatment for

older adults. This result did not reach statistical significance when controlled for other covariates, perhaps because of small numbers.

This study does have important limitations. First, we chose not to send reminders and second mailings in order to respect physicians' right to refuse participation, and as a result, achieved a participation rate of 42.5%. This response rate, however, is consistent with [12, 15], or better than [16], previous surveys of rheumatologists in the US. In addition, because the questionnaires were returned anonymously, we do not have any information on the non-respondents. Nonetheless, some demographic characteristics of the respondents are similar to a recent, large survey conducted on the same population [12].

In order to limit the number of potential influences on physician behaviour, we did not vary patient gender in the scenarios. However, gender has been shown to affect healthcare in other fields [17, 18]. In addition, we did not have a large enough sample size to examine all associations between physicians' characteristics and age bias. In practice, efforts to reduce age bias in rheumatologists would most likely be directed at a general population of practicing clinicians and not specific subgroups.

Age bias in medicine is a well-recognized problem in healthcare delivery and has received considerable attention in fields such as oncology and cardiovascular disease, but has not been well-studied in rheumatology [6–9, 19–24]. The results of this study, along with other evidence [2, 3], suggest that underutilization of DMARDs in older adults may be partially explained by age bias. Examining this bias as an influence on physicians' treatment recommendations is particularly important in RA given that the incidence of RA increases with age and the proportion of older adults is steadily growing. Future educational efforts should increase physician awareness of this possible bias in order to ensure equal service delivery across ages.

### Acknowledgements

We would like to thank all participants for their time and effort. L.F. is supported by the K23 Award AR048826-01 A1.

The authors have declared no conflicts of interest.

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