ORIGINAL RESEARCH

Considering Patient Preferences When Selecting Anti–Tumor Necrosis Factor Therapeutic Options

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Background: Anti–tumor necrosis factor (TNF) medications for the treatment of chronic inflammatory conditions represent a large and growing expenditure for health plans. Over the past few years, there has been an increase in options for patients receiving anti-TNFs, including choice of agent, route of administration, and location for receiving the medication.

Objective: To examine patient preferences regarding available anti-TNF agents and mode of administration options.

Methods: This cross-sectional survey and claims study was based on administrative claims in the HealthCore Integrated Research Database. Patients were identified for this study if they were receiving infliximab (the intravenous [IV] group) or adalimumab, golimumab, etanercept, or certolizumab pegol (the subcutaneous [SC] group) between March 2012 and August 2012 and were diagnosed with conditions for which these agents are indicated by the US Food and Drug Administration. The survey questionnaire was developed specifically for this study. Participants were asked about their use of anti-TNF agents, locations of administration, preferences for IV or SC therapy, interest in anti-TNF home therapy options, and their physician's role in their decision-making process. A validated instrument, the Treatment Satisfaction Questionnaire for Medication (TSQM) version II, was used to assess treatment satisfaction by the patients.

Results: A total of 6000 patients were included in the final list of patients, and the study was stopped when the targeted number of 500 surveys were completed. The IV group consisted of 202 (40%) patients, and the SC group consisted of 298 (60%) patients. Patients in the SC group had a higher preference for the administration route they were using compared with patients in the IV group: 89.9% of the SC group preferred the SC route of administration, whereas 71.8% of the IV group preferred the IV route (P <.001). The global treatment satisfaction scores were similar in both groups (81.9 in the IV group, 80.1 in the SC group; P = .247). The reported likelihood of patients discussing alternative anti-TNF options with their physician was low (45.5% in the IV group vs 49.7% in the SC group; P = .366).

Conclusions: When asked to make a hypothetical choice between IV and SC administration, patients had stronger preferences for SC routes than for IV routes. There was a strong correlation between the route of administration in use and the preference, indicating high level of satisfaction with the current treatment used, which was confirmed with the TSQM version II results. An opportunity for patient education exists, because conversations with physicians about alternative anti-TNF therapies and administration appear to be lacking.

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The use of anti–tumor necrosis factor (TNF) medications for the treatment of chronic inflammatory conditions, such as rheumatoid arthritis (RA), Crohn's disease, or psoriasis, represents a large and growing healthcare expenditure. For example, a 2013 sales forecast for adalimumab, the most frequently used injectable anti-TNF, projected continued growth in annual sales from $9.2 billion to $11.2 billion in 2016,[1] and infliximab, an intravenous (IV) infusion anti-TNF, generated more than $7 billion in revenue in 2012.[2]

Parallel with the increased use of the anti-TNFs, there has been emerging evidence that the anti-TNFs have similar effectiveness and safety profiles,[3-6] giving patients more options in terms of medication route and frequency of administration. Infliximab, the first anti-TNF approved by the US Food and Drug Administration (FDA),[7]

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KEY POINTS

- The anti-TNF agents for chronic inflammatory conditions constitute a large and growing expenditure for health plans.
- These agents increasingly include more choices, various administration routes, and different service sites for receiving them.
- Patient preference is integral to the selection of therapeutic agents and routes of administration, which can increase treatment success.
- For this study, surveys completed by 500 patients discuss their anti-TNF use, preferences for mode of administration, interest in home therapy, and their physician's role in treatment decisions.
- A high correlation was seen between current route of administration and patient preference, with 89.9% of patients using SC therapy preferring the SC route and 71.8% of those using IV agents preferring the IV route.
- Fewer than 50% of respondents discussed alternate anti-TNF options with their physicians, despite their desire for better communication.
- This study confirms findings of earlier studies but also provides updated information related to alternatives to IV infusions for a large set of indications.

is available only as an IV infusion and requires administration by a medical provider every 4 to 8 weeks.[8] Patients receiving infliximab have several options regarding where the infusion is administered, all of which include administration by a healthcare professional, including at a medical facility, such as a physician's office; an infusion center; an outpatient department of a hospital; or at home by a home health agency nurse, all of which are typically covered by insurance plans.

Subcutaneous (SC) anti-TNFs, including etanercept, adalimumab, certolizumab pegol, and golimumab, offer the convenience of self-injection, but they need to be administered on a more frequent schedule, from twice weekly to once monthly, depending on the agent and its FDA indication.[9-12] Since the 2013 FDA approval of its IV formulation, golimumab is the only anti-TNF agent available as both SC and IV medications.[11]

In the current healthcare environment of offering a wide variety of treatment options with similar clinical effectiveness but differing routes of administration and dosing regimens, there is an opportunity for patient preferences to play a greater role in the selection of agents. IV treatment may appeal more to patients who desire greater physician control over medication administration, who feel the need for a physician's presence for a sense of safety, or who have difficulty complying with a self-injecting regimen.[13]

By contrast, despite a more frequent dosing regimen, SC administration offers patients more flexibility and convenience, because their medication can be administered during the time selected by the patient, with no need for medical appointments. Self-administration also eliminates the need to travel to the physician's office or to other facilities, which usually needs to occur during business hours, thus making it an attractive option for individuals who are more active or who are in the workforce.[13]

Previous research on mode of administration preferences among anti-TNF users is scarce; especially lacking are US-based studies and studies examining a wide variety of indications. A small British study of preferences among 109 patients with RA showed that 48% of patients preferred to administer their medication themselves, whereas 41% preferred having the hospital staff administer the treatment.[13]

A different single-center British study of 100 patients with RA reported that patients receiving anti-TNF therapy and those not yet receiving biologic therapies preferred SC injection as their first choice over intramuscular or IV administration; they also preferred administration at home rather than in an outpatient or inpatient setting.[14]

A 2009 Italian study of 802 patients with RA showed that both IV and SC anti-TNFs were well accepted, with patients evenly split in terms of their preferences for the route of administration.[15] Finally, a recent study of 107 patients with RA in Denmark reported that IV administration was preferred by 85% of patients who are currently receiving IV therapies, and SC routes were preferred by 71% of patients who are currently receiving SC therapies.[16] We identified only a single US-based study on the topic: a 2008 analysis of 50 patients with irritable bowel disorder reported a slightly greater percentage (54.3%) of patients expressing preference for the SC route of delivery, and all patients who had experienced both routes also preferring SC administration.[17]

Our study was designed to evaluate a large, geographically and clinically diverse, sample of US patients in 2012 who were using anti-TNFs regarding their preferences for route and place of administration, treatment satisfaction, and information sources related to their choice of therapy. This information is especially timely, because there are currently many more anti-TNFs available than before.

Methods

Study Design

This prospective observational study assessed the outcomes of 2 groups of patients: those receiving an IV in-

fusion anti-TNF (ie, infliximab) and those receiving an SC anti-TNF (ie, adalimumab, golimumab, etanercept, or certolizumab pegol).

The study consisted of a cross-sectional patient survey, with all survey-related materials approved by a central Institutional Review Board before the start of the survey. Eligible patients were included if they were fluent in English, could communicate by telephone, and consented to the study. Patients were contacted by telephone between November 29, 2012, and December 19, 2012, and either completed a 30-minute survey by telephone with the interviewer or via the Internet. Patient-level data were handled in compliance with the Health Insurance Portability and Accountability Act of 1996.

The survey questionnaire was developed specifically for the study and included questions about patients' demographic and socioeconomic characteristics, use of anti-TNF agents, site of administration, preferences for IV or SC therapy, interest in anti-TNF home therapy, and their information sources about anti-TNFs. A sample questionnaire with selected questions from the survey is listed in the **Appendix** (available at www.AHDBonline.com). A validated patient-reported outcome instrument, the Treatment Satisfaction Questionnaire for Medication (TSQM) version II, was used to assess treatment satisfaction.

Patient Eligibility

The HealthCore Integrated Research Database was used as a sampling frame to identify the eligible patient population, consisting of patients who were using an anti-TNF medication and who had been diagnosed with 1 or more of the FDA-approved indications for anti-TNF agents. Specific patient inclusion criteria included (1) at least 1 claim for infliximab, adalimumab, golimumab, etanercept, or certolizumab pegol between March 2012 and August 2012, and at least 1 medical claim with an *International Classification of Diseases, Ninth Revision, Clinical Modification* diagnosis code of Crohn's disease, RA, plaque psoriasis, psoriatic arthritis, or ankylosing spondylitis during the 6-month period before the initiation of the anti-TNF agent; (2) age ≥18 years; (3) health plan membership at the time of patient sample list creation; (4) nonmissing telephone number and/or address; and (5) not being on the HealthCore do not call list.

The survey population was further restricted to a maximum of 6000 patients, selected at random, with an overrepresentation of patients taking infliximab and patients with a diagnosis of Crohn's disease (regardless of whether they used infliximab or an SC medication). Patients who received infliximab were oversampled to facilitate comparisons between the main groups of interest (IV and SC), and patients with Crohn's disease were oversampled to facilitate subgroup analysis by condition.

Outcomes

Patient preferences and treatment satisfaction. Patients were asked to rank their preference for the route of administration of anti-TNFs, with options of expressing strong preference for an injectable, slight preference for an injectable, slight preference for an infusion, or strong preference for an infusion. All patients were asked this question, regardless of whether they had an experience with single or multiple routes of administration. We used a forced-choice method to elicit definitive opinion, because we were interested in providing the most actionable data for decision makers. For similar reasons, patients were asked to choose whether they would like to take their anti-TNF medications at home using a Likert scale with an even number of responses.[18]

For the assessment of anti-TNF treatment satisfaction, we used an 11-item validated satisfaction questionnaire, the TSQM version II, which allows for comparisons across various medication types and therapeutic areas. Four subscale scores were obtained, including effectiveness, side effects, convenience, and global satisfaction with treatment.[19] The subscale scores each ranged from 0 to 100, with higher scores representing greater satisfaction with the effectiveness, lack of side effects, convenience, and global satisfaction of the respondents with their anti-TNF medications.

Information sources related to choice of therapy. Patients were also asked whether their doctor had discussed prescribing for them any anti-TNF medication other than what they were currently taking. The patients who reported having such discussions were further asked whether the physician expressed preferences for one drug over another, and if so, whether the physician explained the reasons for that preference.

In addition, patients were asked to report where they usually received information about anti-TNF therapies, to report the mode by which they were most interested in receiving information, and to rank their interest in receiving additional information, on a scale from 1 to 5, where 1 was completely not interested and 5 was extremely interested.

Statistical Methods

Sample size. The final list of patients eligible for the survey consisted of 6000 patients. All available patients with a claim for infliximab (N = 2095), as well as all patients with a diagnosis of Crohn's disease (N = 1914) were retained in the study sample; the remaining patients who met the initial inclusion criteria (N = 2948) were randomly selected from the larger patient population of patients receiving anti-TNFs. The targeted number of completed surveys was set at 500, with the survey phase ending after reaching the targeted number.

Data analysis. This was a descriptive study. For each of the 2 anti-TNF groups (ie, IV and SC), summary statistics, including mean and standard deviation, were provided for continuous variables; counts and percentages were provided for categorical variables. The differences between the 2 groups were compared using a *t*-test for continuous variables and a χ^2 test for categorical variables. Statistical analyses were conducted with SAS version 9.1 software (SAS Institute; Cary, NC). All statistical tests were 2-sided and were performed at a 5% level of significance.

Results

Of the 6000 patients included in the final patient list, 1370 patients had been contacted at the point when the target numbers of 500 complete surveys and 7 partial surveys were reached, resulting in a cooperation rate (ie, the percentage of respondents agreeing to be interviewed of the eligible patients contacted) of 37%.

Among respondents with completed surveys, the IV group consisted of 202 patients (40%) and the SC group consisted of 298 patients (60%).

Patient Characteristics

Patients' characteristics are listed in **Table 1**. The patient age distribution was different between the groups; IV users were more likely to be in the younger age-group (30.7% in the IV group vs 21.5% in the SC group) and in the older age-group (16.3% in the IV group vs 5.4% in the SC group), whereas SC patients were more likely to be of working age (73.2% in the SC group vs 53% in the IV group; P <.001).

As expected, because autoimmune diseases are more common in women, the respondents were more likely to be women (69.3% in the IV group and 67.1% in the SC group; P = .606). Respondents had similar distributions of household income. An overwhelming majority of respondents were white—more than 90% of patients in each group. In addition, similar proportions of both groups had a college or university degree (43.1% in the IV group, 46.3% in the SC group; P = .736).

A higher percentage of respondents in the SC group were employed full time outside the home than in the IV group (59.4% in the SC group vs 48% in the IV group; P = .039). The IV group was more likely to be composed of patients with Crohn's disease (38.6% vs 25.8% in SC group; P = .004) and was less likely to include patients with RA (45.5% vs 50.7% in the SC group; P = .007) and those with plaque psoriasis (5.9% vs 16.8% in the SC group; P = .001).

The majority of patients reported using anti-TNFs for at least 1 year, but the IV group had a higher percentage of patients in the longest treatment category (84.2% in the IV group vs 74.8% in SC group; P = .011; Table 1). In addition, 48 (23.8%) patients in the IV group had previously used an SC anti-TNF and 61 (20.5%) patients in the SC group had previously used an IV anti-TNF.

Outcome Measures

Patient preferences and treatment satisfaction. Noticeably, there was high correspondence between the expressed preference and the administration route for the medications that patients were currently taking (**Table 2**). This pattern was present regardless of the indication, and it held for patients who had previously used a different administration route (results are available on request). However, patients in the SC group reported a higher preference for the route of administration they were currently using compared with the IV group: 89.9% of patients in the SC group reported either a slight or strong preference for an SC anti-TNF, whereas only 71.8% of patients in the IV group had a slight or strong preference for infusions (P <.001).

We observed differences in preference regarding the location where patients received their treatment (facility-based vs home services). When asked whether they would like to be able to take anti-TNF medication at home, 46.1% of patients in the IV group reported either somewhat agreeing or strongly agreeing, indicating significant interest in being able to receive the medication outside of medical facilities (**Table 3**). In the SC group, a very high proportion (96.3%) of patients expressed preference for receiving medications at home. Although 46.1% of patients receiving IV medications liked the home administration option, only 1.5% were using it (results are available on request).

The results from the validation instrument TSQM version II indicated treatment satisfaction to be high and similar between the groups (**Table 4**). In terms of specific subscale scores, patients in the IV group reported higher effectiveness scores than in the SC group (82.4 ± 16 and 78.8 ± 19.3, respectively; P = .025) but lower convenience scores (75.6 ± 15.6 compared with 79 ± 14.8, respectively; P = .015). There were no significant differences between the 2 groups on the side effects subscale scores or on the global satisfaction subscale scores.

Information sources related to choice of therapy. Slightly less than half of the respondents reported that they had had a discussion with their physician about alternative anti-TNF medications (45.5% of the IV group and 49.7% of the SC group; P = .366; **Table 5**). Those rates fluctuated depending on the condition, but differences between groups did not reach statistical significance in either of the condition-specific subgroups (results are available on request).

Among the patients who had a discussion with their

Table 1 Patient Characteristics of Anti-TNF Users[a]

Characteristics	Intravenous anti-TNF users, N (%) (N = 202)	Subcutaneous anti-TNF users, N (%) (N = 298)	*P* value
Age, yrs			<.001
18-39	62 (30.7)	64 (21.5)	
40-64	107 (53)	218 (73.2)	
≥65	33 (16.3)	16 (5.4)	
Mean	49.8 (16)	49.4 (12.2)	.761
Sex			.606
Female	140 (69.3)	200 (67.1)	
Male	62 (30.7)	98 (32.9)	
Education			.736
High school graduate/equivalent or less	53 (0.3)	65 (0.2)	
Some college, technical school, or trade school, but no degree	37 (18.3)	57 (19.1)	
Completed technical or community college	25 (12.4)	37 (12.4)	
College/university degree or higher	87 (43.1)	138 (46.3)	
Race			
White	185 (91.6)	279 (93.6)	.387
Other	17 (8.4)	19 (6.4)	
Ethnicity			
Hispanic or Latino	9 (4.5)	8 (2.7)	.284
Total household income in the past 12 mo			.083
<$50,000	87 (43.1)	101 (33.9)	
$50,000-$100,000	68 (33.7)	119 (39.9)	
>$100,000	33 (16.3)	64 (21.5)	
Current employment status			.039
Employed full time outside the home	97 (48)	177 (59.4)	
Employed part time outside the home, full-time homemaker, or full-/part-time student	40 (19.8)	54 (18.1)	
Disabled, retired, unemployed	64 (31.7)	67 (22.5)	
Experience with anti-TNF agents			
Current anti-TNF medication use			
Infliximab	202 (100)		
Certolizumab pegol		24 (8.1)	
Adalimumab		140 (47)	
Etanercept		125 (42)	
Golimumab		9 (3)	
Indication			
Crohn's disease	78 (38.6)	77 (25.8)	.004
Rheumatoid arthritis	92 (45.5)	151 (50.7)	.007
Plaque psoriasis	12 (5.9)	50 (16.8)	.001
Psoriatic arthritis	23 (11.4)	50 (16.8)	.076

(*Continued*)

Table 1 Patient Characteristics of Anti-TNF Users[a] *(Continued)*

Characteristics	Intravenous anti-TNF users, N (%) (N = 202)	Subcutaneous anti-TNF users, N (%) (N = 298)	*P* value
Ankylosing spondylitis	15 (7.4)	17 (5.7)	.191
Others	15 (7.4)	14 (4.7)	.200
Duration of current anti-TNF therapy			.011
<2 mo	1 (0.5)	6 (2)	
2 mo to <6 mo	5 (2.5)	25 (8.4)	
6 mo to <1 yr	26 (12.9)	44 (14.8)	
≥1 yr	170 (84.2)	223 (74.8)	
Previous anti-TNF medication use			
Intravenous (infliximab)			
Yes		61 (20.5)	
No		236 (79.2)	
Subcutaneous (adalimumab, certolizumab pegol, etanercept, golimumab)			.133
Yes	48 (23.8)	73 (24.5)	
No	151 (74.8)	225 (75.5)	

[a]Numbers may not add to totals because missing values are not reported.
TNF indicates tumor necrosis factor.

Table 2 Patient Preferences for Route of Administration of Anti-TNF Agents[a]

Patient preference	IV anti-TNF users N (%)	SC anti-TNF users N (%)	*P* value
Overall	N = 202	N = 298	<.001
Strong preference for SC anti-TNF drug	37 (18.3)	211 (70.8)	
Slight preference for SC anti-TNF drug	15 (7.4)	57 (19.1)	
Slight preference for IV anti-TNF drug	35 (17.3)	9 (3)	
Strong preference for IV anti-TNF drug	110 (54.5)	15 (5)	
Patients who had previously used a different route of administration	N = 48	N = 61	<.001
Strong preference for SC anti-TNF drug	11 (22.9)	38 (62.3)	
Slight preference for SC anti-TNF drug	6 (12.5)	12 (19.7)	
Slight preference for IV anti-TNF drug	3 (6.3)	5 (8.2)	
Strong preference for IV anti-TNF drug	28 (58.3)	6 (9.8)	

[a]Numbers may not add to totals because missing values are not reported.
IV indicates intravenous; SC, subcutaneous; TNF, tumor necrosis factor.

physician about an alternative anti-TNF, approximately 66% of patients (63% in the IV group and 69.6% in the SC group) reported that the physicians did not express a preference for one medication over another (Table 5).

Not surprising, physicians were by far the most common source of information for both groups, with approximately 90% of patients listing their physician as 1 of the 3 sources from which they learned about their anti-TNFs (**Table 6**).

Patients receiving infusions reported a higher level of interest in obtaining additional information. On a 5-point scale, 49.5% of patients receiving infusions indicated they were interested or extremely interested in

Table 3 Patient Preference for At-Home Administration[a]

Patient preference	IV anti-TNF users, N (%) (N = 202)	SC anti-TNF users, N (%) (N = 298)	*P* value
Would you like to take anti-TNF medication at home?			<.001
Strongly disagree	78 (38.6)	7 (2.4)	
Somewhat disagree	31 (15.4)	3 (1)	
Somewhat agree	46 (22.8)	6 (2)	
Strongly agree	47 (23.3)	281 (94.3)	

[a]Numbers may not add to totals because missing values are not reported.
IV indicates intravenous; SC, subcutaneous; TNF, tumor necrosis factor.

Table 4 Treatment Satisfaction of Anti-TNF Users[a]

	IV anti-TNF users, mean (SD) (N = 202)	SC anti-TNF users, mean (SD) (N = 298)	*P* value
Effectiveness score	82.4 (16)	78.8 (19.3)	.025
Side effects score	94.3 (16.2)	95.1 (12.8)	.585
Convenience score	75.6 (15.6)	79 (14.8)	.015
Global satisfaction score	81.9 (15)	80.1 (18.6)	.247

[a]Numbers may not add to totals because missing values are not reported.
IV indicates intravenous; SC, subcutaneous; SD, standard deviation; TNF, tumor necrosis factor.

Table 5 Patient Perceptions of the Physician's Role in Choice of Anti-TNF Agent[a]

Patient perceptions	IV anti-TNF users, N (%) (N = 202)	SC anti-TNF users, N (%) (N = 298)	*P* value
Has your doctor ever discussed an alternative or different anti-TNF agent than the one you are currently taking?			.366
Yes	92 (45.5)	148 (49.7)	
No	110 (54.5)	150 (50.3)	
Has your doctor ever expressed a preference for one anti-TNF agent over another?	92	148	.564
Yes, he/she prefers the anti-TNF medication I am currently using	30 (32.6)	39 (26.4)	
Yes, he/she prefers an alternative anti-TNF medication	4 (4.3)	6 (4.1)	
No, he/she has not expressed a preference	58 (63)	103 (69.6)	
How much did your doctor's recommendation influence your choice of current anti-TNF medication?			.073
1-did not influence at all	11 (5.5)	11 (3.7)	
2	9 (4.5)	9 (3)	
3	10 (5)	28 (9.4)	
4	25 (12.4)	59 (19.8)	
5-influenced very much	146 (72.3)	189 (63.4)	

[a]Numbers may not add to totals because missing values are not reported.
IV indicates intravenous; SC, subcutaneous; TNF, tumor necrosis factor.

Table 6 Education Needs of Patients Receiving Anti-TNF Agents[a]

Education needs	IV anti-TNF users, N (%) (N = 202)	SC anti-TNF users, N (%) (N = 298)	*P* value
Usual source of information about anti-TNF medications			
Doctor	189 (93.6)	267 (89.6)	.124
Nurse	113 (55.9)	99 (33.2)	<.001
Radio/TV/Internet	107 (53)	143 (48)	.193
Magazines/newspapers/ books	80 (39.6)	93 (31.2)	.024
Friends/family members	41 (20.3)	48 (16.1)	.291
Online support	35 (17.3)	63 (21.1)	.394
Health plan	34 (16.8)	67 (22.5)	.193
Pharmacist	33 (16.3)	129 (43.3)	<.001
In-person support	30 (14.9)	30 (10.1)	.162
Other	13 (6.4)	32 (10.7)	.058
Level of interest in receiving more information about anti-TNF medications			.008
1-completely not interested	42 (20.8)	69 (23.2)	
2	19 (9.4)	59 (19.8)	
3	41 (20.3)	61 (20.5)	
4	46 (22.8)	45 (15.1)	
5-extremely interested	54 (26.7)	64 (21.5)	

[a]Numbers may not add to totals because missing values are not reported.
IV indicates intravenous; SC, subcutaneous; TNF, tumor necrosis factor.

additional information compared with 36.6% of patients receiving SC agents (*P* = .008).

Discussion

In this study, patients receiving SC anti-TNF agents reported a higher preference for the medication they were currently taking compared with those receiving IV agents. The fact that the preferences among medication users largely corresponded with the route of administration of the drug that patients were taking suggested that they were satisfied with the treatment. The high satisfaction was confirmed by the results of the TSQM version II. The IV users reported higher satisfaction with effectiveness, whereas SC users were more satisfied with convenience.

In addition, a significant portion (46%) of IV patients expressed interest in receiving their medication at home. Many such patients would have several options available, either using a home health agency nurse to receive the infusion at home (<2% of those in the IV group in our study reported actually using that option) or switching to an SC anti-TNF when clinically appropriate.

However, to consider the alternatives available to them, patients need to be informed about different options in terms of agents, administration routes, or locations for treatment. These results demonstrate that although communication with physicians appears to be of high importance in choice of agent and the interest in receiving information about options was substantial, fewer than half of the respondents ever discussed any alternative anti-TNF options with their physician. This highlights a major opportunity for patient education. Such education may be especially important considering that the infusion option has been on the market much longer than other options, and many patients, who usually continue to use an anti-TNF treatment for multiple years, initiated the therapy when alternatives such as infusion administration at home or self-injections were not available.

Although SC administration offers more patient control and convenience by eliminating the need to travel to a physician's office, it does require a patient to be able to self-inject, and the dosing regimens usually require more frequent administration than IV medications.

Some patients may prefer infusions based on the perception of safety because of the presence of medical personnel, and may find the less frequent dosing regimen more appealing. In fact, the 2014 Danish study of patients with RA reported that the most frequent reason among patients for choosing infusions was a wish for safety; among those preferring SC administration, it was a wish to minimize the time of transportation and treatment.[16]

In our study, patients in the IV group were more likely to be in the younger and older age-groups, whereas those in the SC group were more likely to be of working age and to work outside the home. In line with earlier findings, this indicates that lifestyle may play a role in the selection of a specific mode of administration: patients who are working, active, and/or independent are more likely than others to select the option offering better administration flexibility and convenience—the self-administrated anti-TNFs.

Our findings of patients preferring their current route of administration, high treatment satisfaction, and high interest in receiving therapy at home are in line with existing research[14-17]; however, we were able to assess a larger and more geographically diverse sample of patients and include multiple indications.

Inclusion of multiple indications allowed us to perform subgroup analysis by condition, revealing that regardless of the condition, the SC treatment option appears to be more preferred (results are available on request). In addition, because our study interviewed respondents in 2012, it provides updated information for

the time period in which alternatives to IV infusion treatment have become more frequently used across different indications.

Despite the availability of options that could better address patient preferences, barriers to the more common use of alternatives (in addition to patients' lack of knowledge) exist in the healthcare system. For example, among both clinicians and payers, the route of administration ranks low in reported importance in the choice of biologics. According to one analysis, clinicians ranked the route of administration fourth after efficacy, safety, and personal experience.[20] Payers also ranked the route of administration fourth after efficacy, contracting, and safety.[20]

In addition, financial incentives can favor the choice of an infusion anti-TNF in both commercial and Medicare markets.[21,22] Infusions are typically covered under medical benefits, which often have more favorable deductibles and out-of-pocket maximums for patients, whereas injections tend to be provided under pharmacy coverage with relatively higher copays or coinsurance.[23]

Patient preference is integral to the decision regarding the selection of therapeutic agents and routes of administration, given the potential to increase treatment success. Convenience and ease of administration have been linked to improved adherence to medication regimen.[19] This is an important consideration for anti-TNF therapy, where consistent adherence is very important and is often challenging, with as many as approximately 25% of all users nonadherent to their medication regimen.[24]

Finally, focuses on quality of life and patient convenience, where similar efficacy and safety for medications have been demonstrated, fall in line with a trend toward the inclusion of quality measures that incorporate patient satisfaction in addition to clinical outcome. For patients using anti-TNF agents, the provision of information on all appropriate agents, routes of administration, and site of infusion service options may engender greater patient trust, sense of shared decision-making, and patient satisfaction.

Limitations

Our survey cooperation rate was 37%. Although the cooperation rate is representative of the rates obtained for similarly structured surveys of health plan members where a concern about member abrasion was implemented by a maximum of 5 contact attempts and no attempts to convert refusals, the results may not be representative of the target population.

The results may not be generalizable to individuals who have noncommercial health insurance or no insurance.

Many patients received only 1 type of therapy, and this would have hindered their ability to provide a fully informed decision on their preferred route of administration.

The questions regarding preference for administration method used a 4-point Likert scale, which might contribute to a bias among patients holding ambiguous attitudes; however, the nonresponse rate for these questions was minimal (ie, <2.5%).

Finally, we did not ask patients about their health status, which might affect preferences.

Conclusions

This survey established that in a commercially insured population of patients using anti-TNF agents, patients receiving SC agents had a higher preference for the medication they were currently taking compared with those receiving infusion therapies. Patients receiving infusions reported higher effectiveness than those using SC agents but lower convenience; however, the magnitudes of the differences were not high, and global satisfaction was similar. A significant proportion of patients in the infusion group expressed interest in receiving their medication at home. These results suggest that the newer options of self-injectable administration and/or home-based infusions, when clinically appropriate, can be attractive alternatives for many patients. Despite that, we found that fewer than 50% of patients ever discussed alternative anti-TNFs with their physician and home-based options were used infrequently. This finding points out a need for greater communication to patients about the options that are available to them.

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Author Disclosure Statement

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STAKEHOLDER PERSPECTIVE

In a Fix on Addressing Alternatives

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"If it ain't broke, don't fix it." This popular phrase, which is attributed to Bert Lance, Director of the Office of Management and Budget under President Jimmy Carter, purports to promote the concept of leaving well enough alone. Change should be made as a result of a specific need for having said change made and not merely for the sake of the change itself. When it comes to medical care, some may even argue that it aligns quite well with Hippocrates' admonition to physicians of "primum non nocere" (ie, first, do no harm).

PATIENTS: And so it is in this vein that we look at the study by Sylwestrzak and colleagues that evaluated patient preference in the selection of anti–tumor necrosis factor (TNF) therapeutic options. The authors note that patient preference is key to the selection of therapeutic agents and to the routes of administration. The results of the survey show that nearly 90% of patients receiving subcutaneous (SC) therapy preferred that method of administration, whereas nearly 72% of patients receiving anti-TNF agents via intravenous (IV) infusion preferred that route. Yet, despite this significant difference, both groups were satisfied with their medication's route of administration. Finally, the study showed that the group receiving IV medication was more interested in receiving additional information about alternative treatment options.

These points lead us to ask 2 important questions: (1) is it "broke?" and (2) if it isn't broken, should we fix it anyway? The implication of the first question, according to the study authors, is that, yes, a problem exists. A significantly greater proportion of members were more satisfied with SC treatments than those receiving IV treatments, and more patients who received IV treatments wanted their physicians to discuss alternative routes of medication administration with them. However, given that there was no discernible difference in the

patient global satisfaction scores, can we really say that a problem exists, especially when the IV group noted significantly higher effectiveness scores?

It is difficult to answer that question, because preference for therapy may be confounded by satisfaction with therapy, and satisfaction with therapy may be a function of health status, which the authors acknowledge they did not ask about. Then, the outcomes noted may be more a function of the so-called endowment effect.[1] To paraphrase the endowment effect, the mere fact that a patient is receiving a given treatment (or, in behavioral economics terms, is the "owner" of said treatment) makes it more likely that the patient values the treatment that he or she has more than an alternative treatment. Furthermore, because the patient does not "own" the alternative treatment, it is considered less valuable or less worthwhile. This, again, begs the questions of whether it is broken, and whether a problem exists.

PAYERS: We find our answer here: the group receiving IV medication was more interested in receiving additional information about alternative treatment options. Other studies have shown that mere exposure to an object (ie, "the exposure effect") promotes preference but does not promote valuing the object more, whereas the endowment effect increases the value one attributes to an object but not necessarily a preference for that object.[2] Because the IV group expressed a desire for more information on alternatives, while still ascribing value to IV treatment effectiveness, one could argue that the presence of an endowment effect does not mitigate the authors' conclusions; moreover, it may even serve to strengthen them.

As payers and members/patients work to strengthen their partnership in improving health and well-being, both groups should bear in mind that communication regarding potential alternatives promotes such a goal. Whether the situation is broken becomes irrelevant; in the spirit of continuous improvement, we can always fix it to make it better. ■

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