Published in final edited form as:

Am J Cardiol. 2009 February 15; 103(4): 535–539. doi:10.1016/j.amjcard.2008.10.017.

Internal Medicine Physicians' Perceptions Regarding Rate versus Rhythm Control for Atrial Fibrillation

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Abstract

Atrial fibrillation (AF) is often managed by general internal medicine physicians. Available data suggest that guidelines regarding AF management are often not followed, but the reasons for this remain unknown. We sought to assess the knowledge and beliefs of internists regarding strategies to treat AF. We conducted a national electronic survey of internal medicine physicians regarding their perceptions of optimal AF management, with an emphasis on the rationale for choosing a rhythm or rate control strategy. One hundred and forty-eight physicians from 36 different states responded (representing at least 19% of unique e-mails opened). Half of the respondents reported managing their AF patients independently without referral to a cardiologist. Seventy-three percent of participants believe a rhythm control strategy conveys a decreased stroke risk, 64% believe there is a mortality benefit to rhythm control, and 55% think that it would help avoid long term anticoagulation. Comparing those who prefer a rhythm control strategy to everyone else, those who favor rhythm control statistically significantly more often believe that rhythm control reduces the risk for stroke (96% versus 67%, $p=0.009$) and that rhythm control allows for the discontinuation of anticoagulation therapy (76% versus 49%, $p=0.045$). In conclusion, contrary to available data in clinical trials and recent guidelines regarding the rationale for choosing a rhythm control strategy in treating AF, the majority of study participants believe that rhythm control decreases stroke risk, decreases mortality, and allows for discontinuation of anticoagulation therapy. These prevalent misconceptions may substantially contribute to guideline non-adherence.

Keywords

Atrial Fibrillation; Guidelines; Rhythm Control; Stroke; Anticoagulation; Internal Medicine

There has been no prior assessment of internists' understanding of the data regarding appropriate AF management as dictated by recent clinical trials and outlined in the 2006 AF guidelines.¹ With the hypothesis that some proportion of general internal medicine physicians believe that a rhythm control strategy reduces the risk of stroke in AF subjects, we performed a national survey, seeking to assess the knowledge and beliefs of internists regarding AF.

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Conflicts of interest: None

Methods

We performed an electronic survey of a random sample of board certified internal medicine physicians in the United States who had e-mail addresses registered in the American Medical Association (AMA) Masterfile. Physicians with additional board certifications were excluded. Participants were solicited by email and correspondence was completed anonymously through the AMA. Initially, 3,000 invitations were sent, each containing a unique code to access the survey online. To minimize participant bias, the subject of the survey was not disclosed in the email title. Correct e-mail addresses of the intended participants could not be verified, nor could we confirm that our solicitations avoided physicians' spam filtering. Email invitations were sent to previously non-respondent physicians a total of six times over a two month period. After each round of invitations was sent, opening the email was registered as a unique "open," confirming that the physician had successfully received the solicitation. Each physician could thus have as many as six unique "opens", one after each emailed invitation. To conservatively estimate the response rate (i.e. favoring underestimation), the number of responses was divided by the total number of unique "opens". The survey was administered through an internet-based survey company (Survey Monkey, Portland, OR), which also compiled the responses.

The survey included 31 questions and was originally beta tested with 5 Internal Medicine Physicians (2 academic physicians, 2 in private practice, and 1 in an HMO setting). The participants were initially asked whether they preferred a rate control (with anticoagulation) or rhythm control (with or without anticoagulation) strategy for their AF patients. Participant demographics were determined by both open ended and close-ended questions. The majority of the remaining questions were closed ended, with 5-point Likert-scales ranging from 1="definitely does not" to 5="definitely does", surveying perceived barriers and incentives to each treatment strategy. Likert scales were analyzed in 2 ways: 1. The scales were dichotomized, using the combination of 4 and 5 versus scores 1, 2, and 3 to compare affirmative responses to non-affirmative responses and combining scores 1 and 2 versus 3, 4, and 5 to compare negative responses to nonnegative responses. 2. The mean Likert responses was calculated. As incentive, \$3 was donated on behalf of each participant to one of five non-profit organizations (Unicef, Doctors without Borders, Save the Children, The Humane Society, or the Red Cross) selected by the participant. The money was donated in aggregate at the completion of the study by Atricare Inc. (Cincinnati, Ohio) as part of an unrestricted grant (GMM).

Normally distributed continuous variables are expressed as means $\pm$ SD. Variables not normally distributed are expressed as medians and interquartile ranges (IQR). Normally distributed continuous variables were compared using t-tests or analysis of variance as appropriate and continuous variables that were not normally distributed were compared using the Wilcoxon rank sum test or the Kruskal-Wallis test as appropriate. Categorical variables were compared using the χ^2 test. Two tailed p values < 0.05 were considered statistically significant.

Results

Among 3,000 initial invitations to participate, there were 769 e-mail unique "opens" confirming receipt of invitation. There were 148 total unique participants for an overall response rate of at least 19% (note that, as described above, a unique e-mail open could be registered after each e-mail sent, such that some participants that opened the e-mail in response to more than one invitation may be counted more than once, leading to a potential underestimation of the response rate).

Respondents represented practices in 36 American states. The mean age was 49 ± 10 years old (range 31 to 71), the median time since completion of residency was 16 years (range 1 to 40), and their median distance from a major medical center was 8 miles (range 0 to 220). Forty percent were in private practice, 24% were academic physicians, 24% were in a group practice, 4% worked for an HMO and 15% identified “other” work environments. The median percent time spent on direct patient care was 90% (IQR 70–100%), and the median percent of direct patient care spent in an outpatient setting was 90% (IQR 70–100%). The median number of total patients seen per week was 72, (IQR 50–100), and a median of 5% (IQR 3.5–10%) of these have AF. A median 50% (IQR 20–90%) of practitioners report managing their AF patients independently (without referral to a cardiologist).

Regarding an overall preference for rate control with anticoagulation versus rhythm control with or without anticoagulation as the optimal strategy for the treatment of AF, 60% of respondents believed rate control was the better strategy, 22% reported that rhythm control was better, and 18% considered the two strategies to be equal. No statistically significant differences in geographic region of the practice, number of patients seen in a week, or percentage of AF patients cared for were observed across these answers. Similarly, other basic participant demographics were not different across these different answers (Table 1).

Of the internists who generally preferred a rate control strategy, difficulty maintaining sinus rhythm (84%) and the risks of antiarrhythmic agents (79%) were cited as their primary reasons (table 2). This choice was not driven by perceived difficulties referring to a cardiology specialist or concerns regarding cardioversion procedures.

As shown in table 3, when physicians choose a rhythm control strategy, 88% cite symptom control as an important reason. Independent of the optimal strategy chosen, 73% of all participants believe a rhythm control strategy conveys a decreased stroke risk, 64% believe there is a mortality benefit to rhythm control, and 55% think that it would help avoid long term anticoagulation.

As shown in Figure 1, those that prefer a rhythm control strategy more often reported that rhythm control decreases stroke risk and allows for discontinuation of anticoagulation. Comparing those who prefer a rhythm control strategy to everyone else, those who favor a rhythm control statistically significantly more often believe that rhythm control reduces the risk for stroke (96% versus 67%, $p=0.009$) and that rhythm control allows for the discontinuation of anticoagulation therapy (76% versus 49%, $p=0.045$). Although not statistically significant, those who prefer rhythm control also more often reported that rhythm control reduces mortality (80% versus 61% $p=0.157$). Importantly, even among physicians that prefer a rate control strategy, the majority believes that rhythm control decreases stroke risk and mortality (Figure 1).

Those who believe that a rhythm control strategy reduces the risk for stroke were significantly older than those who do not (50 ± 10 years old versus 45 ± 11 years old, $p=0.018$) and reported a longer time since completing residency (18 [IQR 9–26] years versus 11 [IQR 4–23] years, $p=0.047$). No differences in geographic region, miles to a major medical center, type of practice, or number of patients cared for were observed between those who did and did not believe that a rhythm control strategy reduced the risk for stroke.

Of those that reported that a rhythm control strategy reduced mortality, 93% believe it also reduces the risk for stroke; however, of those that do not believe rhythm control reduces mortality, significantly fewer (35%) believe it reduces the risk for stroke, $p<0.001$.

Eighty-eight percent of participants reported that they have referred AF patients to a cardiologist or an electrophysiologist with the intent of having a patient considered for

curative catheter ablation. Of those that prefer a rhythm control strategy, the median perceived success rate for AF ablation was 60% (IQR 30–70%), which did not differ significantly from the perceptions of those who prefer rate control (50%, IQR 30–70%, $p=0.47$). Likewise, perceived complication rates of curative AF ablation procedures were not significantly different for those that prefer rhythm control (5% [IQR 2–10%]) versus those that prefer rate control, (5% [IQR 5–5%], $p = 0.68$).

Discussion

This study demonstrates important misconceptions regarding management of AF among primary care internists despite the incorporation of major randomized clinical trial data into the most recent guidelines. The majority of study participants believe that rhythm control decreases stroke risk, decreases mortality, and allows for discontinuation of anticoagulation therapy. These misconceptions are especially prevalent among those who generally favor rhythm control. The majority of the internists surveyed report that they manage their AF patients independently (without referral to a cardiologist), raising concern that many AF patients may be subject to unnecessary risk.

The AFFIRM trial demonstrated no difference in mortality or stroke rate between rhythm and rate control strategies for patients with AF and at least one risk factor for stroke or death.² Subsequent studies have corroborated these findings^{3–6} and confirmed that continued anticoagulation use in high risk AF patients greatly reduces the risk of thromboembolic events irrespective of the management style chosen.⁷ The 2006 ACC/AHA/ESC guidelines on AF make continued anticoagulation for all patients with AF (barring those with lone AF or contraindications) a Class 1 recommendation.¹

Longitudinal care of AF is primarily managed by primary care internists. While data have shown that AF management in the primary care setting often deviates from the published guidelines,^{8–11} the reasons for this are unclear. Given that AF is associated with an increased risk of stroke, it is intuitive that a rhythm control strategy would decrease this risk. Those internists who believe rhythm control reduces stroke risk were significantly older and were significantly further from completion of residency training than those who do not believe rhythm control reduces stroke risk. This belief was otherwise not significantly different by type of medical practice, distance from a major medical center, area of the country, number of patients seen per week, percent of patients seen in an outpatient setting, or percent of those patients with AF. Therefore, in targeting educational programs meant to rectify pertinent knowledge gaps in the future, the challenge will be to effectively communicate messages to physicians that have been out of training and in practice for sometime.

One might argue that those who favored rhythm control were thinking of the benefits of curative AF ablation. However, no meaningful differences in referral rates for ablation or perceptions regarding AF ablation success and/or failures were observed between those that favored rate versus rhythm control. Regardless, there are no prospective clinical trials of AF ablation to definitively show that it can reduce the risk of stroke, improve mortality or clearly negate the need for warfarin.

Although we have focused on issues of safety and misconceptions regarding stroke risk, there also may be an important misinterpretation regarding the optimal treatment of symptomatic patients gleaned from this survey: 60% of our respondents feel that rate control is better than rhythm control for AF. This is predicated on anticipated problems with antiarrhythmic agents, fitting well with well established difficulties in using these agents.^{2, 6, 12} However, as outlined in the 2006 guidelines, there are certain patients who can clearly benefit from maintenance of sinus rhythm, particularly those with symptomatic

AF.^{13–16} The general preference for rate control suggests that some may misinterpret recent clinical trial results and guidelines as conveying rate control as the superior strategy. It must be remembered that AF that remains symptomatic despite rate control is a Class I indication for a rhythm control strategy.¹

This study has several potential limitations: our response rate of 19% may have resulted in a biased sample. However, this response rate is a conservative estimate as the denominator was based on the number of unique e-mail opens per e-mail blast, and it is possible that some respondents opened the e-mail more than once over the 6 blasts sent. Although we can not exclude the possibility that bias is playing some role, it is unlikely that it is responsible for the full magnitude of the responses observed: as the majority of our respondents reported that rhythm control has benefits never observed in clinical trials and contrary to guidelines, it is likely that a substantial proportion of practicing internal medicine physicians hold these misconceptions (i.e., even if bias explained half of the respondents answers, more than 25% of internists would still believe that a rhythm control strategy negates the need for warfarin). In fact, the participating internists represented a diverse group by every measure: a wide variation in ages, years since residency, miles from a major medical center, geographic location, and type of practice suggest that this may indeed compose a representative sample. Certainly, these respondents differ from some internists in that they all had working e-mail addresses, but, if anything, these might be expected to be the more technically knowledgeable group. Also, all participants were board certified in internal medicine, a group that is likely more extensively trained than many physicians in general practice, suggesting that our study may *underestimate* the knowledge of actual practitioners. The invitation for the survey did not include mention of the survey topic; therefore, while those that responded might be different in terms of characteristics of those that respond to electronic surveys, there should not have been differences related to attitudes towards AF.

Acknowledgments

Funding Sources: This work was made possible by grant number KL2 RR024130 (G.M.M.) from the National Center for Research Resources (NCRR), a component of the NIH, and the American Heart Association Western States Affiliate Beginning Grant-in-Aid Award (G. M. M.). The incentive charitable contributions were provided by an unrestricted grant to Dr. Marcus by Atricure, Inc (Cincinnati, Ohio).

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Figure 1. Percentage of internal medicine physicians who believe a rhythm control strategy reduces strokes, allows for discontinuation of anticoagulation, and improves mortality in patients with AF.

Table 1

Comparison of baseline demographics of internal medicine physicians who favor rhythm control (defined as attempting to obtain and maintain sinus rhythm with or without anticoagulation), rate control (defined by controlling ventricular rate while utilizing anticoagulation), or believe both are equally preferable.

	Prefers Rhythm Control n=25	Prefers Rate Control n=72	Reports Both as Equal n=22	p value
Mean age (range)	52 (30–71)	49 (31–67)	46 (31–71)	0.87
Median years since residency (range)	19 (1–40)	16 (1–35)	16 (1–40)	0.41
Median miles to a Major Medical Center (range)	8 (0–70)	7 (0–220)	10 (0–100)	0.89
Percent of physicians in academic medical centers	25%	24%	15%	0.66
Percent of AF patients managed independently	50%	55%	80%	0.33

Percent and degree to which respondents cited each of the various factors above when asked, “In general, what influences your decision to choose a strategy of rate control rather than rhythm control?” Rating average from 1 to 5, with 1 being least important and 5 being most important. The most frequent responses are in bold.

Table 2

	Definitely Does Not	1	2	3	4	5	Definitely Does	Rating Average
Decreased stroke risk	23%		14%	31%	16%	16%		2.87
Mortality benefit	14%		17%	33%	19%	17%		3.09
Difficulty maintaining sinus rhythm	0%		1%	15%	36%	48%		4.32
Risk of antiarrhythmic agents	3%		4%	14%	43%	36%		4.07
Difficulty referring to a cardiologist	59%		17%	10%	11%	3%		1.83
Risk of cardioversion procedure	21%		35%	23%	16%	5%		2.49

Table 3

Percent and degree to which respondents cited each of the various factors above when asked, “In general, what influences your decision to choose a strategy of obtaining and maintaining sinus rhythm (with medicines or cardioversion)?” Rating average from 1 to 5, with 1 being least important and 5 being most important. The most frequent responses are in bold.

	Definitely Does Not					Definitely Does	Rating Average
	1	2	3	4	5		
Symptom control	1%	4%	8%	30%	58%		4.39
Decreased stroke risk	7%	8%	13%	21%	52%		4.03
Mortality benefit	11%	11%	14%	25%	39%		3.71
Avoid long term anticoagulation	4%	15%	27%	32%	23%		3.53
Possibility of reducing the chance of permanent AF in the future	8%	22%	20%	32%	19%		3.33