Emergency Department Management of Atrial Fibrillation and Flutter and Patient Quality of Life at One Month Postvisit

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Study objective: We identify characteristics of patients with atrial fibrillation or flutter associated with favorable assessments of emergency department (ED) effectiveness and 30-day quality of life.

Methods: As part of a prospective observational study of ED management and short-term outcomes of patients with nonvalvular atrial fibrillation or flutter, we adapted a disease-specific quality-of-life instrument. By telephone, we administered the Atrial Fibrillation Effect on Quality-of-life survey to patients 30 days after an ED visit in which they were treated for newly diagnosed or recent-onset atrial fibrillation or flutter and discharged home. We also asked respondents to rate the effectiveness of ED treatment. Using data prospectively collected in the ED and extracted from electronic health records, we recorded rhythm management (cardioversion attempts and type) and patient and ED treatment characteristics. Using multivariable regression, we examined the association between these characteristics and patient-reported effectiveness of ED treatment ("very effective" or not) and any atrial fibrillation or flutter quality-of-life effect.

Results: Six hundred fifty-two eligible ED patients (response rate 89%) treated between May 2011 and November 2012 completed follow-up. Of these patients, 454 (69.6%) reported that their ED treatment was "very effective" and 113 (17.3%) reported no quality-of-life influence. In multivariable analyses, there was an association between ED electrocardioversion and perceived ED effectiveness ($P<.05$) but none between treatment strategy and 30-day atrial fibrillation or flutter quality-of-life score. Respondents who were younger, women, and had worse pre-ED self-reported health ($P<.05$) were more likely to report a quality-of-life effect.

Conclusion: In this observational study, ED rhythm management strategy was associated with greater perceived effectiveness of the ED visit but not with a difference in 30-day quality-of-life score. [Ann Emerg Med. 2015;66:646-654.]

Please see page 647 for the Editor's Capsule Summary of this article.

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INTRODUCTION

Background

Atrial fibrillation is the most common sustained cardiac rhythm disturbance in adults, a risk factor for ischemic stroke and worsening heart failure, and a major public health problem.[1,2] The societal and economic burden associated with atrial fibrillation and flutter is compounded by its increasing prevalence among our aging population.[3] As a consequence, emergency department (ED) visit rates for symptomatic atrial fibrillation or flutter are increasing and can be expected to continue to do so; the literature suggests that approximately 1% of all US ED visits are related to atrial fibrillation or flutter.[4,5]

Management of ED patients with atrial fibrillation or flutter varies considerably; hospital admission rates are erratic across settings.[4,6-8] Recent evidence suggests that aggressive protocols of ED cardioversion (pharmacologic or electrical) in patients with recent-onset paroxysmal atrial fibrillation or flutter are both safe and feasible.[9-11] Uptake of these protocols in clinical practice, as opposed to the traditional approach of exclusive rate control and stroke prevention, has been variable.[6] And although ED cardioversion for select patients with atrial fibrillation or flutter may be safe and effective, its ramifications on patient-oriented outcomes have not been well studied. Although short-term adverse event rates for certain low-risk patients with atrial fibrillation or flutter who are discharged home from the ED are low,[12,13] less attention has been

Editor's Capsule Summary

What is already known on this topic

Atrial fibrillation in the emergency department (ED) can be managed by controlling rate or rhythm. Few data exist on patients' perception of which treatment is most effective and whether treatment approach affects 30-day quality of life.

What question this study addressed

Was treatment method associated with treatment effectiveness and 30-day quality of life in 652 patients with new- or recent-onset atrial fibrillation or flutter who were discharged from the ED?

What this study adds to our knowledge

The patients perceived cardioversion as more effective. However, quality-of-life ratings were similar for the 2 groups.

How this is relevant to clinical practice

This study highlights the importance of using patient-centered outcomes when evaluating therapies. The choice of rhythm versus rate control is not resolved by this study.

paid to the potential benefits of ED management decisions on patient satisfaction and disease-specific quality of life. A number of disease-specific survey tools have been developed to assess quality of life in patients with atrial fibrillation or flutter, but minimal work has been done to apply these to assess short-term follow-up in post-ED-discharge patients.[14-18] Given the high rate of abnormal rhythm recurrence in certain patients with atrial fibrillation or flutter, as well as evidence suggesting that clinicians underestimate the quality-of-life burden of arrhythmias, such assessments are a critical component of treatment algorithms that maximize ED and short-term outcomes.[19,20]

The goal of this study was to assess the association of ED visit and atrial fibrillation or flutter management characteristics with patient-reported ED visit satisfaction (specifically, the perceived treatment effectiveness), as well as disease-specific quality-of-life score at 30 days.

MATERIALS AND METHODS

Setting

This prospective observational study was conducted at Kaiser Permanente Northern California, a large integrated health care delivery system that provides comprehensive medical care for more than 3.6 million members across 21 medical centers. EDs had an aggregate ED census of nearly 1 million visits in 2013 and were staffed by more than 500 salaried (board-certified or -prepared) emergency physicians. During the study period (May 2011 to November 2012), the annual census of the 7 study EDs ranged from 25,000 to 78,000. Between 2006 and 2010, Kaiser Permanente Northern California implemented a commercially available complete inpatient electronic health record (Epic, Verona, WI).

Study Design

As part of a multicenter prospective observational study of ED management and short-term outcomes of patients with atrial fibrillation or flutter, we adapted a validated disease-specific quality-of-life assessment tool (the Atrial Fibrillation Effect on Quality-of-life [AFEQT]) for use in telephone follow-up for patients aged 18 years or older who were discharged home from the ED with newly diagnosed or recent-onset ($\leq$48 hours) paroxysmal nonvalvular atrial fibrillation or flutter.[17] The details of the larger study will be described in detail elsewhere. The larger study enrollment was restricted to health plan members aged 18 years or older with an ED visit for atrial fibrillation or flutter that was new, recent-onset, symptomatic, ED treated, or thought to be triggered. Eligible patients for the larger study were identified at the ED visit, and observational data were collected at the visit by the treating emergency physician through a standardized data collection tool and were retrospectively audited for accuracy by research staff by electronic health record chart review.

This quality-of-life study included patients with an index ED visit for which they received atrial fibrillation– or flutter-related treatment or diagnostics and were discharged home from the ED.

The Kaiser Permanente Northern California Health Services Institutional Review Board approved the study.

The AFEQT is a novel disease-specific quality-of-life instrument for patients with atrial fibrillation or flutter, designed to be used as a self-administered questionnaire in the clinical setting.[17] The AFEQT, which evaluates patients' perception, respectively, of their atrial fibrillation or flutter symptoms across 4 conceptual domains (symptoms, activities, treatment concern, and treatment satisfaction), can serve as a marker of both quality of care and the physical and emotional disease burden. In a prospective validation of the tool across 6 centers with 219 patients with variable atrial fibrillation or flutter types, internal consistency was greater than 0.88 for all scales. Because of this proven consistency and its potential for modification into a brief telephone survey instrument, we

chose the AFEQT over less specific quality-of-life tools (eg, the Short Form Health Survey [SF-12]) and several other atrial fibrillation or flutter quality-of-life survey scales.[21]

In this study, we kept the original 18-item AFEQT quality-of-life questions but condensed the 7-point Likert response scale to 5 for ease of telephone interviewing. We also asked patients additional questions about their health in the weeks before the ED visit, the effectiveness of ED treatment, and the medication compliance. The question about effectiveness of ED treatment was worded as follows: "During your ED visit [date of index visit], how effective did you consider the treatment you received in the ED at reducing the symptoms caused by your [atrial fibrillation or atrial flutter]: very effective, somewhat effective, neutral, less than effective, not effective?"

The telephone survey instrument was pre-tested to assess length and clarity of wording. Three trained research assistants conducted telephone surveys with eligible patients starting 28 days after the ED visit. Research assistants were trained and overseen by the study project manager, in consultation with the original AFEQT study team, and weekly meetings were held to address any survey administration difficulties. When necessary, queries were addressed by the original AFEQT study team.[17] Attempts to contact potential participants occurred between 8 AM and 8 PM during both weekdays and weekends, with a maximum of 15 attempts per subject. Patients provided consent for survey participation by telephone with an Institutional Review Board-approved script and were excluded before or at the call if they were unable to discriminate between atrial fibrillation or flutter and other comorbidities, unable to recall the diagnosis, too ill to talk, receiving hospice or other palliative care, deceased, or non-English speaking. Survey responses were recorded on paper data sheets and answers were securely transferred into study databases by data entry specialists.

The full survey is available as Appendix E1, available online at http://www.annemergmed.com.

We linked telephone follow-up responses with patient-level data available from health plan electronic databases, and with observational data collected by treating emergency physicians at the index ED visit. An eligible encounter was defined as the first ED visit involving treatment for atrial fibrillation or flutter (rate or rhythm control) for which the patient received a follow-up telephone call and completed at least 14 of the 18 AFEQT questions (this last criterion was made post hoc after analysis of response rate distribution). The study's Consolidated Standards of Reporting Trials (CONSORT) diagram is shown in the Figure. Responses to perceived ED effectiveness were dichotomized to "very effective" or not, and AFEQT scores were calculated according to the original scoring methods with a scaled transformation (of the 5-point responses) to maintain a 0-to-100 scale.[17] AFEQT scores were then dichotomized as either "no atrial fibrillation or flutter effect" (score=100) or "some atrial fibrillation or flutter effect" (score <100). Additional post hoc analyses were run according to response distribution and using quartiles of AFEQT scores.

From existing health plan electronic databases, we included the following patient-level variables: age, sex, Charlson comorbidity score, neighborhood socioeconomic status from patients' census block group, facility of ED visit, last recorded ED pulse rate, and warfarin use (existing pre-ED visit, warfarin started in ED, or first started after the ED visit but within 30 days postvisit).[22] During the study period, novel anticoagulants (eg, dabigatran and apixaban) were not in the formulary in Kaiser Permanente Northern California and not in routine use. From the observational data set, we abstracted patient-reported time of symptom onset, new onset of atrial fibrillation or flutter (yes/no), ED treatment approach (rate control or rhythm management [electric versus pharmacologic attempt]), ED discharge rhythm, and post-ED rate control therapy.

We used 2 separate logistic regression models for the 2 primary outcomes: patient-reported ED effectiveness and 30-day atrial fibrillation or flutter quality of life. The main predictor for each model was ED treatment approach (electrical cardioversion [with or without pharmacologic], pharmacologic cardioversion alone, and no cardioversion), and covariates were (1) dichotomous: sex, time of symptom onset ($\leq$48 hours or not), new onset of atrial fibrillation or flutter (yes/no); and (2) categorical: age, patient-reported previsit health status, socioeconomic status, Charlson score (0, 1, or $\geq$2), facility, last recorded ED pulse rate (<100, 100 to 120, or >120 beats/min), and post-ED rate control agents (no new prescription, new β-blocker prescription, or other new rate control agent) and warfarin use.

The models included adjustment for clustering at the facility level (Stata's cluster option for robust standard errors). Additional multinomial logistic analyses were performed with the quartile of the quality-of-life score as the outcome, using the same covariates. A post hoc sensitivity regression analysis was performed, excluding respondents with greater than 48 hours or unclear duration of atrial fibrillation or flutter symptoms at the ED visit. Additionally, post hoc stratified analyses were conducted to assess for potential interactions and effect modifications.

We also used electronic health record databases with linkage to the Social Security Death Master File and the California State Department of Vital Statistics to

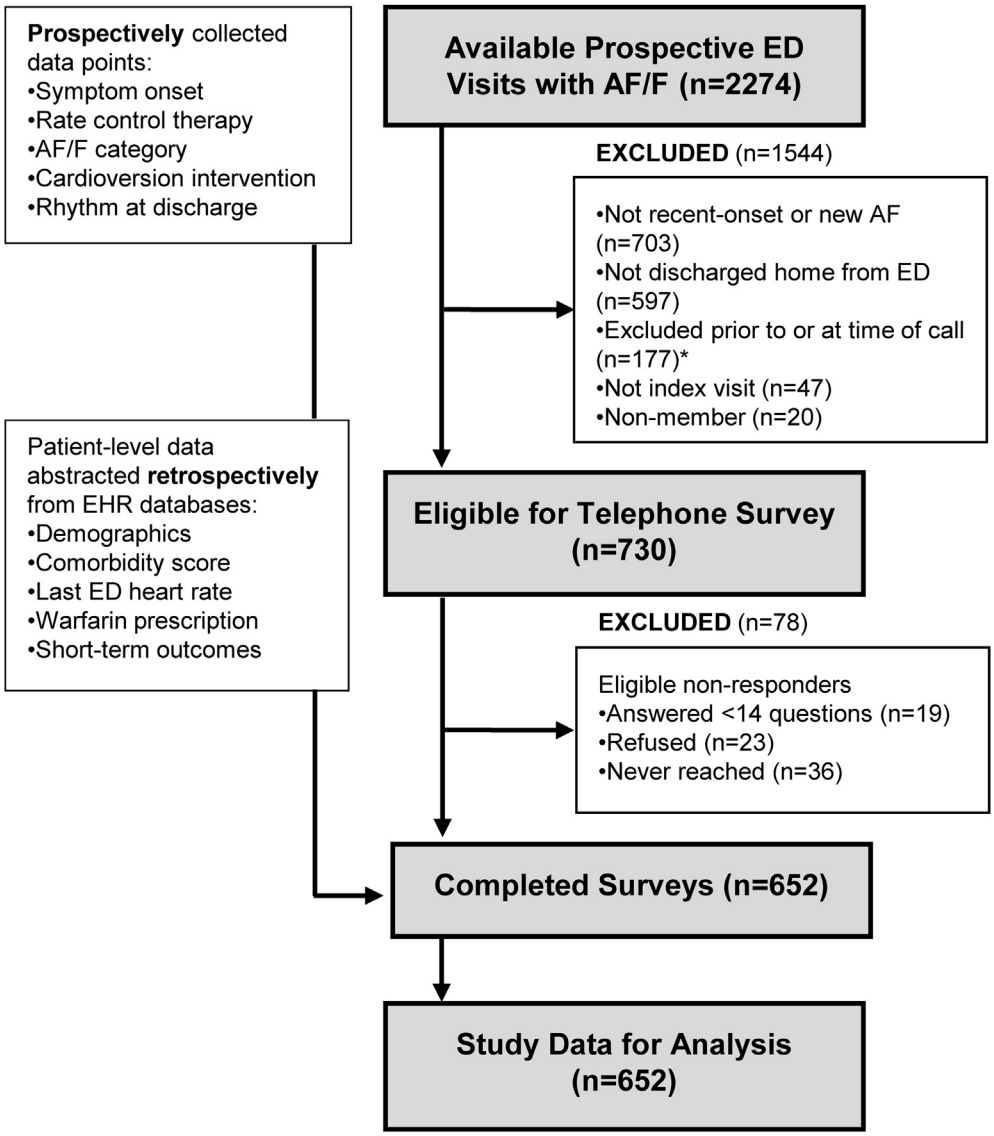

Figure. Flow of patients in the study. *Patients were consented for survey participation by telephone with an IRB-approved script and excluded before or at the call if they were unable to discriminate between AF/F and other comorbidities, unable to recall the diagnosis, too ill to talk, receiving hospice or other palliative care, deceased, or non-English speaking. *ED*, Emergency department; *AF/F*, atrial fibrillation/flutter; *EHR*, electronic health record.

retrospectively examine the characteristics and major 30- and 90-day outcomes (death and thromboembolic complications) and use or recidivism (ED, inpatient, or outpatient visit) between eligible nonrespondents and respondents. For these comparisons, χ^2 tests were used for categorical variables; continuous values were assessed with the *t* test when normally distributed and with the Wilcoxon–Mann-Whitney nonparametric test when not normally distributed.

We used Stata SE (version 12.1; StataCorp, College Station, TX) for all statistical analyses.

The Kaiser Permanente Northern California Health Services Institutional Review Board approved the study.

RESULTS

Of 730 eligible patient encounters, 652 (89%) resulted in a complete follow-up survey (Figure). Median time from ED visit to telephone follow-up was 32.5 days (interquartile range 29 to 42). The practical performance of the telephone survey was excellent. For example, as previously reported, the average time per call in a sample of 483 patients was 10.5 minutes (median 10; interquartile range 8 to 12).[23,24]

Across the 7 medical centers, enrollment ranged from 28 to 211 patients (median 83; interquartile range 46 to 101). Descriptive characteristics of patient respondents are shown in Table 1 and telephone survey

Table 1. Respondent and clinical characteristics.

	No. (652)	%
QoL questions answered (out of 18)		
14	45	6.9
15	53	8.1
16	64	9.8
17	93	14.3
18	397	60.9
Sex		
Female	312	47.9
Male	340	52.2
Age, y		
18–49	73	11.2
50–59	123	18.9
60–69	187	28.7
70–79	169	25.9
≥80	100	15.3
Socioeconomic status		
Higher	562	86.2
Lower	86	13.2
Missing	4	0.6
Charlson score*		
0	365	56.0
1	111	17.0
≥2	149	22.9
First warfarin prescription		
None	377	57.8
Pre-ED	87	13.3
In ED	124	19.0
Post-ED	64	9.8
AF/F symptom onset, h		
>48	52	8.0
≤48	501	76.8
Unclear	99	15.2
AF/F category		
Paroxysmal	547	83.9
Chronic	18	2.8
Unclear	87	13.3
Cardioversion intervention attempted		
None	432	67.3
Electric	163	25.4
Pharmacologic only	47	7.3
Last recorded ED pulse, beats/min		
<100	554	85.0
100–120	57	8.7
≥120	41	6.3
Rhythm at discharge		
Sinus	410	62.9
AF	214	32.9
Flutter	28	4.3
Post-ED rate control		
No change	325	49.9
New β-blocker	116	17.8
Change β-blocker	62	9.5
Other new/change†	149	22.9

QoL, Quality of life; *ED*, emergency department; *AF*, atrial fibrillation.
*There were 27 patients (4.1%) with a missing score.
†Of these, 100 (15.3%) were new calcium channel blockers, 13 (2.0%) were changes in calcium channel blocker dose, and 4 (0.6%) were a new prescription for digoxin.

Table 2. Respondent-reported variables.

	No. (652)	%
How would you characterize your general health status in the weeks before your visit to the ED [date of index visit] for [atrial fibrillation or atrial flutter]?		
Excellent	105	16.1
Very good	178	27.3
Good	226	34.6
Fair	99	15.2
Poor	40	6.1
Very poor	2	0.3
Missing	2	0.3
Of the full amount prescribed in the ED, what percentage of your new [medication] [date of index visit] have you been receiving?		
100	311	47.7
80–99	20	3.1
60–79	5	0.8
40–59	11	1.7
<40	31	4.8
Missing	274	42.0
During your ED visit [date of index visit], how effective did you consider the treatment you received in the ED at reducing the symptoms caused by your [atrial fibrillation or atrial flutter]?		
Very effective	454	69.6
Somewhat effective	80	12.3
Neutral	51	7.8
Less than effective	14	2.2
Not effective	14	2.2
Did not recall treatment	31	4.8
Missing	8	1.2
AFEQT effect (score, binary)		
None (100)	113	17.3
Any (<100)	539	82.7
AFEQT quartile (score)		
1 (>98.3)	164	25.2
2 (93–98.3)	166	25.5
3 (79–92)	162	24.9
4 (<79)	160	24.5

AFEQT, Atrial fibrillation effect on quality-of-life.

results in Table 2. Four hundred fifty-four respondents (69.6%) reported that their ED treatment was "very effective," and the median AFEQT score was a favorable 93 (range 20 to 100; interquartile range 79 to 98), with 113 (17.3%) scoring 100 (no effect). The response histogram is available in Figure E1 (available online at http://www.annemergmed.com). Among respondents who received an electrical cardioversion attempt (with or without pharmacological) in the ED, 92.2% (153/166) were discharged in normal sinus rhythm as opposed to 81.6% (40/49) who received a pharmacological cardioversion attempt (with or without electrical) and 49.7% (217/437) who did not receive rhythm management.

The characteristics and outcomes of the 78 eligible nonrespondents are shown in Table E1 (available online at http://www.annemergmed.com). There were no statistically significant differences ($P>.05$) between the characteristics of the respondents and nonrespondents. There were no deaths in either group within 90 days, and only 4 thromboembolic complications in the

Table 3. Predictors of ED effectiveness and 30-day quality of life.*

	ED Effectiveness (Very Effective vs Not)			Afib-Related QoL (No QoL Effect vs Any)		
Predictor	**AOR**	**95% CI**	***P* Value**	**AOR**	**95% CI**	***P* Value**
ED intervention (vs none)						
Electric	3.4	2.2–5.1	<.001	1.2	0.5–2.6	.68
Pharmacologic only	1.5	0.8–2.8	.16	0.4	0.2–1.1	.09
Male (vs female) patient	1.0	0.8–1.3	.95	1.7	1.4–2.2	<.001
Age (vs 18–49), y						
50–59	1.5	0.8–2.8	.19	2.5	0.6–10.3	.21
60–69	1.4	0.7–3.1	.35	2.9	1.0–9.1	.06
70–79	1.9	0.9–4.0	.08	4.6	2.2–9.5	<.001
≥80	2.4	1.6–3.7	<.001	10.5	3.6–30.4	<.001
Charlson score (vs ≥2)						
0	0.8	0.6–1.2	.39	1.4	1.0–2.1	.09
1	1.1	0.6–1.8	.83	1.3	0.5–3.1	.56
Unavailable	2.1	0.7–6.4	.20	2.7	1.0–6.8	.04
Symptom onset (vs recent)						
>48 h	1.6	0.7–3.8	.24	3.9	1.3–11.8	.02
Unclear	0.8	0.7–1.0	.07	2.2	1.2–4.3	.02
First warfarin prescription (vs post-ED)						
None	1.8	1.1–2.9	.01	1.4	0.9–2.3	.14
Pre-ED	2.7	1.8–4.0	<.001	1.7	0.9–3.1	.09
In ED	1.0	0.6–1.7	.95	0.6	0.3–1.3	.21
Pre-ED health (vs poor/very poor)						
Excellent	1.9	0.7–4.9	.18	3.6	1.6–8.0	.001
Very good	1.2	0.5–2.6	.69	3.0	1.6–5.5	<.001
Good	1.3	0.4–3.7	.64	2.3	1.4–3.6	<.001
Fair	1.0	0.6–1.8	.94	0.9	0.3–2.9	.83
Discharge pulse (vs <100), beats/min						
100–120	0.7	0.3–1.3	.26	0.6	0.3–1.2	.15
>120	0.6	0.4–1.0	.04	0.7	0.2–3.5	.71
Post-ED rate control (vs none)						
New β-blocker	1.0	0.6–1.8	.91	0.9	0.6–1.4	.58
Other	1.1	0.7–1.9	.71	1.1	0.6–1.9	.86

AOR, Adjusted odds ratio.
*Models: Logistic regression with clustering at the facility level (N=652).

respondent group versus none in the non-responder group. There were no significant differences ($P>.05$) in 30-day post-ED visit in-system use (inpatient, outpatient, or ED within Kaiser Permanente Northern California).

Model results are shown in Table 3. The table details characteristics associated with patient-reported effectiveness of their ED visit, with attempted electrical cardioversion being strongly associated with greater perceived treatment effectiveness (adjusted odds ratio 3.4; 95% confidence interval 2.2 to 5.1). Other characteristics associated with higher patient-rated effectiveness are noted in Table 3, including age greater than 80 years, ED discharge pulse rate less than 120, and warfarin prescription status in relation to the ED visit. Patients who were not receiving warfarin or were receiving it before their index ED visit were more likely to consider their ED visit effective than those who received their initial prescription for warfarin either during or after their ED visit.

Table 3 shows patient characteristics associated with reported 30-day quality-of-life outcome. There was no statistically significant association with ED treatment strategy, whereas younger patients, female patients, those with recent-onset symptoms (<48 hours), and those with fair or poor self-reported previsit health were more likely to report some disease-related quality-of-life effect versus patients who were men, were older, were more healthy, and had ED visits with delayed or unclear symptom onset.

The additional analysis treating quality-of-life scores as categorical variables (severity-based quartiles) did not appreciably change the results. Likewise, our sensitivity analysis excluding patients with ED visit atrial fibrillation or flutter symptoms of greater than 48 hours' duration or unclear duration did not significantly change our findings (Table E2 and Appendix E2, available online at http://www.annemergmed.com), other than more strongly supporting the trend toward higher 30-day quality-of-life effect in the subgroup of patients receiving only an attempt

at pharmacologic cardioversion. Finally, our stratified analysis and testing for interaction or effect modification did not find appreciable effects of age (>80 years) and cardioversion attempt.

LIMITATIONS

Our study has several limitations. This was an observational study; thus, ED rhythm management choices were at the discretion of the treating physician and not randomized. Some potentially relevant clinical data, such as history of ED cardioversion attempt and degree of rate control at telephone follow-up, were not reliably obtainable or retrievable. Nonetheless, our modeling has incorporated clinically-relevant covariates and accounted for clustering on a facility level. Telephone survey data have inherent limitations, including recall bias (especially regarding the effectiveness of the index ED visit) and social desirability (acquiescence) bias.[25,26] And our results—strongly skewed toward positive responses—may have been affected by a mode effect because previous work suggests that patients may respond more positively to telephone surveys than written ones.[26] Additionally, we were not able to assess intraobserver reliability in survey responses. Nonetheless, the validity of our survey results is supported by the validated performance of the AFEQT and the low rate of missing responses among respondents.[23]

Because our outcomes were skewed toward positive responses, studies of more symptomatic patients might find an ED rhythm treatment effect on follow-up quality of life. However, our additional analysis using different outcome categories did not demonstrate distinct results, and we did not observe significant differences in characteristics or outcomes among our nonresponder population. Furthermore, because it was the younger patients who were more likely to report a quality-of-life effect, we think our study likely captures the most relevant patient population for an investigation of quality-of-life outcomes in patients with atrial fibrillation or flutter who are discharged from the ED.

DISCUSSION

Our study of 30-day follow-up in patients with new or recent onset of atrial fibrillation or flutter who were treated and sent home from the ED found that patients retrospectively rated the ED treatment more effective if ED electrical cardioversion had been attempted, but that 30-day quality-of-life scores did not vary significantly according to ED treatment approach. In addition, we found that self-reported pre-ED-visit health status was associated with follow-up quality-of-life scores.

With the recent emphasis on patient-centered outcomes, far more attention is being paid to the patient experience.[27] This study focused on a subset of patients for whom the experience is an extremely important outcome. We know that low-risk patients with atrial fibrillation, such as those in this study, have a very low rate of adverse clinical outcomes at 30 days.[12,13,28] However, most investigations of follow-up quality-of-life effects in atrial fibrillation are restricted to highly symptomatic patients with a high quality-of-life burden because previous studies of quality of life in patients with atrial fibrillation or flutter are mostly restricted to those examining rate or rhythm control interventions and are biased toward highly symptomatic individuals.[29-31] Nonetheless, our results among a patient population with less severe illness also did not find a significant difference in quality-of-life burden according to rhythm-related treatment strategy.[32-34]

Our study results apply to clinically stable patients with atrial fibrillation or flutter and are consistent with our clinical experience; patients tend to be very satisfied if their ED visit results in cardioversion of their arrhythmia, but such perceived ED effectiveness may not consistently translate to improved perception of symptoms and quality of life at 30 days. There are, of course, myriad potential reasons for this observation, the most obvious being that atrial fibrillation or flutter is a commonly recurring arrhythmia. Other reasons for the mitigation of cardioversion effect after ED visit could include patient anxiety about rhythm status after the ED visit, as well as the hassle and cautions that go along with anticoagulation. Older patients were less likely to report disease-specific quality-of-life effect, perhaps because of their greater baseline health limitations and comorbidity burden that may make them less sensitive to rhythm-specific quality-of-life effects.

We also found that women were more likely to report a quality-of-life burden from atrial fibrillation or flutter. This finding is consistent with previous investigations suggesting sex differences in reporting symptom burden, with women overreporting (or men underreporting) symptoms.[35,36] In our study 9.8% of patients received a first-time prescription for warfarin during the 30-day window after their ED visit. Although the circumstances underlying this observation were beyond the scope of this study, it is certainly possible that a proportion of these patients were candidates for initiation of anticoagulation in the ED. Thus, further investigation might examine how emphasis on ED initiation of anticoagulation, using validated risk scores, affects both clinical and symptom-burden outcomes.[37,38]

Similarly, some preliminary evidence suggests that patient-directed strategies might be effective in controlling symptom burden, and emergency physicians might consider putting

greater emphasis on these techniques at the index atrial fibrillation or flutter visit. Perhaps ED management should focus as much on lifestyle guidance as it does on rhythm management. Abed et al[39] described the mitigation of atrial fibrillation or flutter symptom burden and severity with a weight reduction and intensive risk factor management program. Yoga may also be effective at managing symptoms, and evidence suggests that fatigue and stress management may also help patients with a new-onset disease burden.[40,41] Last, follow-up care appears to be important in achieving optimal outcomes, and such care might benefit from focus on a more transdisciplinary and holistic approach.[42]

Our study supports the notion that ED management of new-onset or paroxysmal atrial fibrillation or flutter does not have a significant effect on 30-day quality-of-life measurements, so certain subgroups of patients with atrial fibrillation or flutter (eg, >65 years) might be better managed by focusing on overall thromboembolic risk reduction and symptom management. There may, however, be other factors worthy of exploration, according to our observations that were unmeasured or underrepresented in our current sample.

Finally, our study reinforces the observation that the patient experience with atrial fibrillation or flutter, as with many diseases, is a temporally dynamic one. Careful consideration should be paid to the optimal time (or times) to assess treatment effectiveness and patient symptom burden.

In this observational study of patients with nonvalvular atrial fibrillation or flutter, ED rhythm management strategy was associated with higher levels of patient-reported satisfaction with ED visit effectiveness but not with a difference in 30-day rhythm-specific quality-of-life effect. We also found that patients who were female and younger were more likely to report a rhythm-related symptom burden. These results may help inform future work to optimize short- and long-term patient-centered outcomes in patients with atrial fibrillation or flutter.

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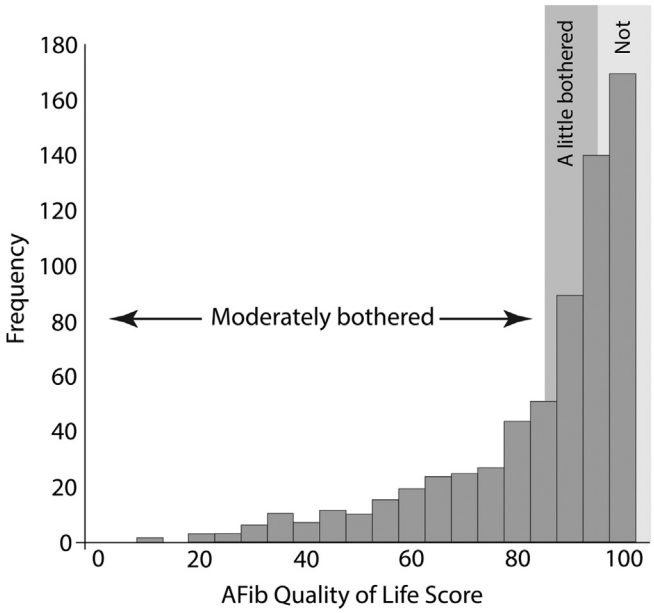

Figure E1. Quality of life score distribution.

Table E1. Nonrespondent characteristics.

Characteristic	No. (78)	%
QoL questions answered (out of 18)		
None	59	75.6
≤13	19	24.4
Sex		
F	39	50.0
M	39	50.0
Age, y		
18–49	16	20.5
50–59	18	23.1
60–69	17	21.8
70–79	17	21.8
≥80	10	12.8
Socioeconomic status		
Higher	62	79.5
Lower	14	18.0
Missing	2	2.6
Charlson score*		
0	35	44.9
1	15	19.2
≥2	20	25.6
First warfarin prescription		
None	52	66.7
Pre-ED	5	6.4
In ED	10	12.8
Post-ED	11	14.1
AF/F symptom onset, h		
>48	9	11.5
≤48	57	73.1
Unclear	12	15.4
AF/F category		
Paroxysmal	68	87.2
Chronic	3	3.9
Unclear	7	9.0
Cardioversion intervention attempted		
None	54	69.2
Electric	19	24.4
Pharmacologic only	5	6.4
Last recorded ED pulse, beats/min		
<100	67	85.9
100–120	3	3.9
≥120	8	10.3
Rhythm at discharge		
Sinus	52	66.7
AF	21	26.9
Flutter	5	6.4
Post-ED rate control		
No change	43	55.1
New β-blocker	13	16.7
Change β-blocker	7	9.0
Other new/change†	12	15.3

*There were 8 patients (10.3%) with a missing score.
†Of these, 11 (14.1%) were new calcium channel blockers, 1 (1.3%) was a new prescription for digoxin, and 3 (3.8%) were missing.

Table E2. Predictors of ED effectiveness and 30-day quality of life among atrial fibrillation or fibrillation less than or equal to 48 hours' duration only (n=501).*

	ED Effectiveness (Very Effective vs Not)			Afib-Related QoL (No QoL Effect vs Any)		
Predictor	**AOR**	**95% CI**	***P* Value**	**AOR**	**95% CI**	***P* Value**
ED intervention (vs none)						
Electric	3.7	2.5–5.4	<.001	1.2	0.5–2.6	.71
Pharmacologic only	1.5	0.8–2.7	.16	0.3	0.1–1.0	.04
Male (vs female) patient	0.8	0.6–1.1	.24	1.4	1.2–1.7	.00
Age (vs 18–49), y						
50–59	1.4	0.8–2.6	.24	1.8	0.3–9.6	.47
60–69	1.2	0.6–2.8	.60	2.0	0.7–5.6	.16
70–79	1.7	0.8–3.8	.19	3.0	1.1–8.0	.03
≥80	2.8	1.6–5.1	.001	6.2	2.1–18.7	.001
Charlson score (vs ≥2)						
0	0.6	0.4–1.1	.09	1.4	0.7–2.5	.35
1	0.8	0.4–1.7	.60	1.2	0.6–2.7	.58
Unavailable	3.5	0.8–15.1	.09	2.2	0.8–6.0	.13
First warfarin prescription (vs post-ED)						
None	1.6	0.9–2.9	.14	2.6	1.1–5.8	.02
Pre-ED	2.9	1.4–5.9	.004	2.9	1.5–5.5	.001
In ED	1.1	0.7–1.9	.65	0.7	0.2–2.9	.59
Pre-ED health (vs poor/very poor)						
Excellent	3.5	0.8–15.1	.09	4.2	2.2–7.9	<.001
Very good	2.7	1.0–7.4	.06	6.2	1.9–20.6	.003
Good	2.0	0.8–4.9	.12	3.3	1.5–7.5	.004
Fair	2.0	0.7–5.2	.17	2.5	0.6–10.9	.23
Discharge pulse (vs <100), beats/min						
100–120	1.0	0.4–2.4	.99	0.4	0.1–1.3	.13
>120	0.5	0.3–0.8	.01	0.5	0.1–2.1	.37
Post-ED rate control (vs none)						
New β-blocker	1.3	0.6–2.6	.52	0.7	0.3–1.4	.28
Other	1.0	0.6–1.6	.86	1.3	0.6–3.0	.48

*Models: Logistic regression with clustering at the facility level (N=501).