Prevalence and Quality of Warfarin Use for Patients With Atrial Fibrillation in the Long-term Care Setting

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Background: Evidence-based clinical practice guidelines recommend the use of warfarin sodium for stroke prevention in most patients with atrial fibrillation (AF) who do not have risk factors for hemorrhagic complications, irrespective of age.

Methods: The medical records of all residents of a convenience sample of long-term care facilities in Connecticut (n = 21) were reviewed. The percentages of all patients with AF (AF patients) and ideal candidates for warfarin therapy (ie, AF patients with no risk factors for hemorrhage) who received warfarin were determined; for patients receiving warfarin, the percentage of days spent in the therapeutic range of international normalized ratio (INR) values (2.0-3.0) was also assessed. The relationship between receipt of warfarin and the presence of stroke and bleeding risk factors was assessed in multivariate models.

Results: Atrial fibrillation was present in 429 (17%) of the 2587 long-term care residents. Overall, 42% of AF patients were receiving warfarin. However, only 44 (53%) of 83 ideal candidates were receiving this therapy. In residents who received warfarin therapy, the therapeutic range of INR values was maintained only 51% of the time. The odds of receiving warfarin in the study sample decreased with increasing number of risk factors for bleeding and increased (nonsignificant trend) with increasing number of stroke risk factors present.

Conclusions: Atrial fibrillation is very common among residents of long-term care facilities. Even among apparently ideal candidates, warfarin therapy is underused for stroke prevention in patients with AF. Prescribing decisions and monitoring related to warfarin therapy in the long-term care setting warrant improvement.

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Atrial Fibrillation (AF) is the most common cause of embolic stroke, an event that produces high rates of neurologic disability and death.1,2 The prevalence of AF increases substantially as patients age, with half of all patients with AF being age 75 years and older.3 Because AF is more common among older individuals, and because the risk of stroke associated with AF increases dramatically with advancing age,4 the risk of thromboembolic stroke in elderly AF patients is an important public health issue.

Six randomized controlled clinical trials have demonstrated that warfarin sodium is highly effective in the prevention of stroke, and death due to stroke, in AF patients,5-11 including the elderly.12 In patients with nonvalvular AF, anticoagulation therapy with warfarin reduces the risk of ischemic stroke by approximately two thirds.12 The reduction in the risk of stroke afforded by aspirin, although less pronounced than that of adjusted-dose warfarin,10,13 is still significant.5,7,12 Based on these findings, evidence-based, authoritative, and widely disseminated clinical practice guidelines14-16 recommend the use of low-intensity warfarin therapy (international normalized ratio [INR], 2.0-3.0) for AF patients who are at highest risk for stroke, ie, patients with a previous stroke or transient ischemic attack, hypertension, structural heart disease, or left ventricular dysfunction, or in patients aged 75 years or older.13,17 For patients with AF who are 65 to 75 years old and who have 1 of these risk factors for stroke, warfarin therapy is recommended. For patients in this age group without risk factors for stroke, warfarin or aspirin therapy should be used, depending on a patient’s risk of bleeding. For AF patients in whom warfarin therapy is declined, contraindicated, or not tolerated, use of aspirin is recommended.
Despite the publication of 5 of the 6 randomized controlled trials of warfarin for stroke prevention in patients with AF during or before 1992, several observational studies using data collected from the early to mid-1990s have suggested that warfarin therapy has been substantially underused in eligible AF patients, particularly among the elderly.\(^\text{18}\) This pattern of care has been documented among patients residing in the long-term care setting,\(^\text{19,21}\) in teaching and community hospital patients,\(^\text{22-26}\) and among community-dwelling outpatients.\(^\text{27-29}\)

Although recent evidence indicates that the use of warfarin therapy for AF has been increasing throughout the 1990s in the outpatient setting,\(^\text{30,31}\) no evidence currently exists regarding trends in the use of warfarin for AF patients in the long-term care setting. In addition, little
is known regarding physicians’ current knowledge of or use of information about risk factors for stroke and bleeding in deciding whether to prescribe warfarin for AF patients in the long-term care setting.

The purposes of this observational study were to assess the following in 2587 residents of 21 long-term care facilities: (1) the prevalence of AF and the percentage of AF patients who receive therapy with warfarin or aspirin; (2) the relationship between the presence of known risk factors for stroke and bleeding complications among individuals with AF and their receipt of warfarin; and (3) the quality of warfarin prescribing and monitoring in nursing home residents with AF.

RESULTS

We reviewed a total of 2858 medical records of residents of the 21 participating long-term care facilities. We excluded 266 records because the length of stay in the facility was less than 30 days of the study period, and 5 records because of the presence of end-stage renal disease. Of the remaining 2587 records, study criteria indicated AF was present in 429 patients (17%), who constituted the principal study population of interest.

CHARACTERISTICS OF THE STUDY POPULATION

The clinical and demographic characteristics of study patients are shown in the Table. The mean±SD age was 87.0 (7.1) years, and most patients were women. Risk factors for stroke were present in 400 (93%) of 429, and risk factors for bleeding were present in 345 (80%). Of the 84 patients with no documented risk factors for bleeding, 1 patient had a documented warfarin allergy.

WARFARIN AND ASPIRIN USE FOR AF

Overall, 180 (42%) of 429 patients with AF received warfarin therapy for at least 2 weeks during the 12-month observation. Of those not receiving warfarin, 136 (35%) of 249 also did not receive aspirin (Figure 1A). In the restricted group of 83 ideal candidates, 44 (53%) received warfarin (Figure 1B). Of the 39 ideal candidates not receiving warfarin, 21 (54%) also did not receive aspirin, thereby leaving 25% of patients without bleeding risk factors who received no form of stroke prevention therapy for their AF.

We also determined that 100 (51%) of all 196 patients with and 80 (34%) of 233 patients without an ECG...
Within the context of stroke prevention in AF patients, when warfarin was prescribed, the results showed that more than half of these patients who did not receive aspirin, despite its proven effectiveness in stroke prevention, did not receive warfarin, despite its efficacy in reducing the risk of stroke. More than half of patients aged 65-75 years, less than half were prescribed this medication, for whom authoritative, widely disseminated practice guidelines recommend treatment with warfarin. The adjusted odds of receiving warfarin decreased as the number of risk factors for bleeding increased, although this difference was not statistically significant for patients with one bleeding risk factor compared with patients with none. Conversely, the adjusted odds of receiving warfarin increased with increasing number of stroke risk factors present, although this did not reach statistical significance.

QUALITY OF MONITORING OF INR

Of the 180 patients who received warfarin therapy, 6 (3%) had no INR data available for assessment. For the remaining 174, the interval between INR determinations was no longer than 7 days for 45% of INRs, 8 to 30 days for 45% of INRs, and longer than 30 days for 5% of INRs. On average, in these 174 patients, the therapeutic range of INR was maintained 51% of the time, was below the therapeutic range 36% of the time, and was above the therapeutic range 13% of the time (Figure 2).

Comment

We found that AF was quite common in the long-term care setting, being present in approximately one sixth of all residents. Despite the presence of additional risk factors for stroke in most AF patients, warfarin was prescribed to only 42%. Among AF patients aged 65 years and older with no contraindications to warfarin therapy (ideal candidates), and for whom authoritative, widely disseminated practice guidelines recommend treatment with warfarin (or potentially aspirin for those aged 65-75 years), less than half were prescribed this medication. More than half of these patients who did not receive warfarin also did not receive aspirin, despite its proven effectiveness in stroke prevention.

The prevalence of AF in the sample of patients we studied was considerably higher than in previous studies of AF in the long-term care setting. Lackner and Battis found an AF (rheumatic and nonrheumatic) prevalence of 9.4% among residents of 5 long-term care facilities in Minnesota, whereas Gurwitz and colleagues found that 7.6% of residents of 30 long-term care facilities in New England and Canada had AF. The reasons for these differences are not clear, but may be related to more stringent requirements for AF documentation in the 2 previous studies. In the present study, residents were considered to have AF if it was indicated by an ECG, or included in written documentation by the treating physician; each of the other cited studies required an ECG showing AF in the medical record indicating that AF was present. Because many residents with AF may not have an ECG in their long-term care facility medical record, to include only those patients with ECG-documented AF may significantly underestimate the prevalence of AF. Although we cannot confirm that patients in our study without an ECG have AF, physician documentation of AF in the absence of an ECG in the ambulatory medical record has been shown to be a sensitive indicator of AF. In addition, our finding that physicians prescribed warfarin to patients with AF and without ECG showing AF in the medical chart suggests that both groups were likely to have AF and that physicians did not prescribe warfarin only in cases of ECG-documented AF. Furthermore, although there was a modest difference in receipt of warfarin between these groups, we suspect that this difference is the result of increased physician surveillance with ECG among AF patients receiving warfarin than among those not receiving warfarin. If our results were generalized to the entire US long-term care population, a conservative estimate of the number of AF patients residing in long-term care facilities would exceed 250,000.

Two previous studies of warfarin use for AF in the long-term care setting conducted with a small number of patients in 1993 and 1994 indicated that warfarin was prescribed for only 17% (12/69) and 25% (17/67), respectively, of all patients with AF. In these studies, warfarin was prescribed only in cases of ECG-documented AF. In a larger study conducted from 1993 to 1995 that included patients from...
30 nursing homes in different geographic areas, only one third of all AF patients were prescribed warfarin. Our data (from 1997 and 1998) indicating that 42% of AF patients (53% of ideal candidates) were receiving warfarin suggest that this therapy continues to be used at low levels for stroke prevention in the long-term care setting, long after publication of the randomized controlled trials demonstrating the effectiveness of warfarin for stroke prevention in AF.

It is difficult to quantify accurately the levels of potential underuse of warfarin in the long-term care setting for residents with AF. In some cases, information relevant to the decision to prescribe warfarin might not be documented in the medical record, such as resident preference regarding this therapy. Second, each of the 6 randomized controlled trials of warfarin had stringent inclusion criteria for study subjects, and thus, final study cohorts consisted of highly selected patients. To the extent that the sociodemographic and clinical characteristics of AF patients in long-term care facilities differ from those of patients enrolled in clinical trials, applying the results of such trials to the care of individual elderly patients can be challenging. Nonetheless, elderly patients are at considerably increased risk for stroke and would therefore potentially benefit the most from warfarin therapy.

Several previous studies have examined barriers to appropriate warfarin use across different health care settings, particularly among elderly patients. By using physician surveys that included clinical vignettes, these studies have identified several reasons for physicians’ tendency to prescribe warfarin less often to older AF patients. These reasons include the perceived difficulty in monitoring anticoagulation therapy and the tendency for concern about the risk for bleeding complications of warfarin therapy to outweigh concern regarding the risk for stroke in untreated AF patients and knowledge deficits regarding risk factors for stroke and the effectiveness of warfarin therapy for stroke prevention in older patients with AF.

In the present study, we found a graded, inverse relationship between increasing number of bleeding risk factors and use of warfarin, and, although not statistically significant, a similar graded relationship between increasing stroke risk factors and increased use of warfarin. Similar relationships have been described in a large, recent cohort of community-dwelling AF patients. Although we did not directly interview physicians in this study, these data suggest that physicians in long-term care facilities may have systematically incorporated patient risk factors for bleeding and stroke into their decision-making process regarding warfarin use. Despite this, the low percentage of residents who received warfarin still suggests that physicians may weigh more heavily the risk for bleeding complications of warfarin therapy than the risk for stroke in patients with untreated AF. Alternatively, our findings may suggest that physicians do not have confidence regarding the benefits of warfarin for stroke prevention in long-term care residents with AF. A significant proportion of patients, however, rate occurrence of a major stroke as a health outcome “worse than death.”

The low proportion of time that the therapeutic range of INR was maintained in patients in our study (51%) was only slightly greater than that observed in 2 earlier studies of anticoagulation monitoring in the long-term care setting (45% and 37%). It is difficult to determine what percentage of the time the therapeutic range of INR could be maintained in AF patients in long-term care facilities under optimal conditions. When patients are cared for in the long-term care setting, problems with patient adherence to medications and INR monitoring are largely eliminated. Use of medications that may interact with warfarin to increase or lower the INR, and variations in diet, are potentially easier to control in the supervised setting of a long-term care facility. Given this, the quality of prescribing of warfarin and monitoring of the INR that we observed appears to be less than optimal. It is not clear whether the physicians treating the patients we studied were intentionally using a different (predominantly lower) target INR range than 2.0 to 3.0, which is suggested by the medical literature and the American College of Chest Physicians, or were not aware of this recommended target INR range.

Warfarin is highly effective in reducing the risk for stroke in patients with AF, particularly older patients. Few conclusions in clinical medicine are as well supported by the results of randomized controlled clinical trials. However, we have shown that 4 to 10 years after the publication of these randomized controlled trials, warfarin continues to be used at low rates among elderly AF patients who reside in long-term care facilities, even among ideal candidates for this therapy. Given the high prevalence of AF in this population, a large number of elderly residents of long-term care facilities appear to remain at greater risk for ischemic stroke than is necessary.

Our study suggests that substantial opportunities exist to improve provision of health care to these patients. The use of dedicated anticoagulation clinics may be an option to allow physicians to use and safely monitor warfarin therapy for elderly AF patients in the long-term care setting. In such clinics, anticoagulation therapy can be comprehensively managed through evaluation of patient-specific risks and benefits; through monitoring of INRs, diet, and concomitant drug therapy; and by making appropriate warfarin dosage adjustments. Several nonrandomized retrospective analyses have suggested that the use of an anticoagulation clinic in the outpatient setting reduces the number of thromboembolic and major bleeding complications for patients receiving warfarin. The use of such clinics may improve outcomes in the long-term care setting as well, which in turn might increase physicians’ comfort with prescribing warfarin for their eligible AF patients who currently do not receive any stroke-prevention therapy.

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