

Prevention of stroke in chronic and recurrent atrial fibrillation: role of the emergency department in identification of “at-risk” patients

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Abstract

The objective was to determine the proportion of patients presenting to the Emergency Department (ED) in atrial fibrillation (AF) who are at high risk of thromboembolic stroke as defined by the American Heart Association and who might benefit from anticoagulation therapy.

We enrolled all patients identified as having AF between 28th June 1999 and 26th March 2000. Data collected included demographic information, presenting complaint, discharge diagnosis, risk factors for thromboembolic stroke, contraindications to anticoagulation (as defined by the Stroke Prevention in AF Investigators), admission and discharge medications, and cardiac rhythm on presentation and at discharge.

193 patients were identified within the study period. Two patient histories were not available for review. 121 patients had a prior history of AF. Of these, 65 patients were at high risk for thromboembolic stroke and had no contraindication to anticoagulation therapy. 43 (66%) were on Warfarin at presentation but 14 (22%) were on Aspirin and 8 (12%) were on neither.

34% of patients with chronic atrial fibrillation presenting to the ED, at high risk of thromboembolic stroke and without contra-indication to anticoagulation, were not anticoagulated on presentation. ED attendance provides an opportunity for intervention for the prevention of stroke in this group.

Introduction

It has been clearly shown that the use of warfarin reduces the incidence of thromboembolic stroke in patients in atrial fibrillation (AF) with high risk variables by as much as 68% (from 12% per year to 4% per year) (Ezekowitz & Levine 1999). However, a number of studies in both community and hospital settings have reported that anticoagulation is under-utilized in this “at-risk” group (Adhiyaman et al, 2000; Albers et al, 1996; Ang et al, 1998; Antani et al, 1996; Bhattacharyya et al, 1999; Brass et al, 1997; Hendrey et al, 1994; Lackner & Battis, 1995).

Due to the volume and demographic characteristics of patients treated, the emergency department (ED) provides an opportunity for the identification of patients with atrial fibrillation who might benefit from warfarin therapy. The aim of this study was to determine the proportion of patients presenting to the ED in

AF who are at high risk of thromboembolic stroke as defined by the American Heart Association (Prystowsky et al, 1996) and who might benefit from anticoagulation therapy.

Methods

Our observational study took place in the Department of Emergency Medicine, Western Hospital from 28th June 1999 to 26th March 2000. This is an adult ED with an annual census of 36,000 patients.

The charts of all patients identified by the ED computerised database or by staff as having AF at the time of presentation to the ED, either as a primary or secondary diagnosis, were subjected to structured chart review by a trained research officer. Information extracted from the medical history included patient demographics, reason for attendance, past medical history, prescribed medications at the time of ED presentation, duration of AF (chronic, acute, paroxysmal), disposition from the ED, presence of high risk variables for stroke, contra-indications for anticoagulation, discharge medications and follow-up.

The high-risk variables for ischaemic stroke in patients with AF used in this study were as recommended by the American Heart Association (Prystowsky et al, 1996). They include a history of hypertension, prior stroke or transient ischaemic attack, diabetes, recent congestive heart failure, and age greater than 65 years.

Contra-indications to anticoagulation, based on the NHMRC (NHMRC, 1996) and Stroke Prevention in Atrial Fibrillation Investigators criteria (The Stroke Prevention in Atrial Fibrillation Investigators, 1992) were an inability to monitor the patient, a history of gastrointestinal or other significant bleeding while on anticoagulation therapy, a history of falls or unstable gait, alcohol abuse or other significant liver/renal disease, poor control of INR, uncontrolled hypertension, previous cerebral haemorrhage and/or other bleeding problems, the daily use of NSAIDs (with the exception of low dose aspirin) and dementia.

Charts of patients identified as being at high risk for stroke, with no contra-indication for anticoagulation were also reviewed by a senior ED registrar to ensure accuracy of data extraction.

According to local practice, formal review by the Clinical Research and Ethics Committee was not required, as this was an observational study without intervention or patient identification.

Results

A total of 193 patients were identified in AF within the study period. Of these, 2 medical histories were unavailable for review. There were a total of 65 patients with chronic or recurrent AF, at least one high-risk variable for stroke and without any contraindications to anticoagulation. This formed the study sample (see Figure 1).

The average age of the group was 74 years (median 74 years). Seventy-five percent of patients were aged 70 years and above. There was little gender disparity with 33 men and 31 women. Discharge diagnoses included unstable angina (17), cerebro-vascular accident (CVA) (6), chest pain (6), acute pulmonary oedema (4), cardiac failure (4), airways disease (3), rapid AF (3) and chest infection (3). The distribution of high-risk variables is shown in Table 1.

Table 1: Incidence of high risk variables

High Risk Variables	Total number of patients (%)	
Age greater than 65 years	55	(85)
Hypertension	41	(63)
Congestive Cardiac Failure	25	(39)
Diabetes	14	(22)
Cerebro-vascular Accident	10	(17)
Transient Ischaemic Attack	1	(2)

On presentation to the ED, 43 patients were already taking warfarin, 14 were on aspirin and 8 were on neither. Therefore, 22 patients (34%) of the study group of 65 patients were not anticoagulated with warfarin at the time of ED presentation. At the time of hospital / ED discharge, 10 of these patients (46%) had been commenced on warfarin, 11 (50%) on aspirin and 1 (4%) on neither.

Of the 30 patients diagnosed with AF for the first time at this ED presentation and who remained in AF at discharge, 16 had high risk variables and no contra-indications to anticoagulation. Fifteen (94%) of these were discharged on warfarin.

Discussion

Thromboembolic stroke is a common complication of chronic or recurrent atrial fibrillation in patients with the high risk variables of hypertension, diabetes, cardiac failure, DVT or pulmonary embolism, previous stroke or transient ischaemic attack or advanced age. The reported incidence in patients not prescribed prophylactic therapy is in the order of 12% per year (Ezekowitz & Levine, 1999). Anticoagulation with warfarin has been shown to significantly reduce this risk (Ezekowitz & Levine, 1999) but previous studies in community and hospital settings suggest that it is under-utilized in this at-risk group (Adhiyaman et al, 2000; Albers et al, 1996; Ang et al, 1998; Antani et al, 1996; Bhattacharyya et al, 1999; Brass et al, 1997; Hendrey et al, 1994; Lackner & Battis, 1995).

Most patients with AF who are at risk of thrombo-embolic stroke are managed very well by their local doctor or specialist. In this study 66% of suitable "at-risk" patients were already on warfarin. Attendance at the emergency department however, provides an additional opportunity for the identification of "at-risk" patients who have slipped through this net.

Emergency departments already have a significant track record in health promotion, injury prevention and intervention for a variety of diseases and injuries. These include interventions for cigarette and alcohol abuse (Williams et al, 2000; Monti et al, 1999; Wright et al, 1998) injury (Kelly, 1994; Close et al, 1999), domestic violence (Fanslow et al 1998) and vaccination (Kapur & Tenebein, 2000; Stack et al 1999).

Different types of intervention could be implemented in the ED. It would be possible to assess patients in the ED for suitability for warfarin therapy and to institute this if indicated. However, full details of past history and social circumstances are often not available at the time of ED attendance. The patient's general practitioner (GP) may well be in a better position to fully to assess these details. Therefore written or verbal notification of patients' GPs, including a list of the high risk variables, contraindications to and rationale for warfarin therapy might be safer and more effective.

Implementation of initiatives such as this in ED is not easy. The workload is high and staff are busy. Health promotion activities could easily be overlooked unless there are systems of reminders (such as computer-based alerts) and quick and easy methods for the intervention (such as pre-printed letters).

There are limitations that should be considered when interpreting the results of this study. The study sample was drawn from a computer database and staff identification. This may not have identified all patients, due to computer coding variation and staff compliance. However, there is unlikely to have been any systematic bias. The data collection for risk factors and contraindications was drawn from the medical record and is therefore reliant on accurate documentation. In addition, the sample was drawn from a single ED and it may be difficult to generalise the results to another setting. However, the results would appear to be consistent with previous studies in this area.

Conclusion

Thirty-four percent of patients with chronic AF presenting to the ED, at high risk of thromboembolic stroke and without contra-indication to anticoagulation were not anticoagulated at the time of presentation. ED attendance provides an opportunity for intervention for the prevention of stroke in this group.

References

- Adhiyaman V, Kamalakannan D, Shah IU & White AD 2000, Underutilization of antithrombotic therapy in atrial fibrillation, *Journal of the Royal Society of Medicine* 93, pp138-140.
- Albers GW, Yim JM, Belew KM, Bittar N, Hattemer CR, Phillips BG et al. 1996, Status of antithrombotic therapy for patients with atrial fibrillation in university hospitals, *Archives of Internal Medicine* 156, pp2311-2316.
- Ang SY, Peterson GM, Friesen WT & Vial JH 1998, Review of antithrombotic drug usage in atrial fibrillation, *Journal of Clinical Pharmacy and Therapeutics* 23, pp97-106.
- Antani MR, Beyth RJ, Covinsky KE, Anderson PA, Miller DG, Cebul RD et al. 1996, Failure to prescribe warfarin to patients with nonrheumatic atrial fibrillation, *Journal of General Internal Medicine* 11, pp713-720.
- Bhattacharyya A & Sharma SC 1999, Atrial fibrillation in a general hospital: how well are we doing? *International Journal of Clinical Practice* 53, pp273-276.
- Brass L, Krumholz H, Scinto J & Radford M 1997, Warfarin use among patients with atrial fibrillation, *Stroke* 28, pp2383-2389.
- Close J, Ellis M, Hooper R, Glucksman E, Jackson S & Swift C 1999, Prevention of falls in the elderly trial (PROFET): a randomized controlled trial, *Lancet* 353, pp93-7.
- Ezekowitz MD & Levine JA 1999, Preventing stroke in patients with atrial fibrillation, *JAMA* 281, pp1830-5.
- Fanslow JL, Norton RN, Robinson EM & Spinola CG 1998, Outcome evaluation of an emergency department protocol of care on partner abuse, *Australia and New Zealand Journal of Public Health* 22, pp598-603.
- Hendrey A, Campbell AM, Macdonald JB & Williams BO 1994, Antithrombotic therapy prescribed for patients with non-rheumatic atrial fibrillation, *Scottish Medical Journal* 39, pp110-111.
- Kapur AK & Tenebein M 2000, Vaccination of emergency department patients at high risk of influenza, *Academic Emergency Medicine* 7, pp354-8.
- Kelly AM, 1994 Go-Karts and an Emergency Department: a case report in injury prevention, *Emergency Medicine* 6, pp311-313.
- Lackner TE & Battis GN 1995, Use of warfarin for nonvalvular atrial fibrillation in nursing home patients, *Archives of Family Medicine* 4, pp1017-1026.
- Monti PM, Colby SM, Barnett NP, Spirito A, Rohsenow DJ, Myers M et al. 1999, Brief intervention for harm reduction with alcohol-positive older adolescents in a hospital, *Journal of Consulting and Clinical Psychology* 67, pp989-94.
- National Health and Medical Research Council (Australia) 1996, Prevention of Stroke: Clinical Practice Guidelines, The Council, Australia.
- Prystowsky EN, Woodrow-Benson D, Fuster V, Hart RG, Neal-Kay G, Myerburg RJ et al. 1996, Management of patients with atrial fibrillation - a statement of health-care professionals from the subcommittee on electrocardiography and electro-physiology, American Heart Association, *Circulation* 93, pp1262-1277.
- Stack SJ, Martin DR & Plouffe J 1999, An emergency department-based pneumococcal vaccination program could save money and lives, *Annals of Emergency Medicine* 33, pp299-303.
- The Stroke Prevention in Atrial Fibrillation Investigators 1992, Predictors of thromboembolism in atrial fibrillation, I: clinical features of patients at risk, *Annals of Internal Medicine* 116, pp 1-5.
- Williams JM, Chinnis AC & Gutman D 2000, Health promotion practices of emergency physicians, *American Journal of Emergency Medicine* 18, pp17-21.
- Wright S, Moran L, Meyrick M, O'Connor R & Touquet R 1998, Intervention by an alcohol health worker in an accident and emergency department, *Alcohol and Alcoholism* 33, pp651-6.

