J R Coll Physicians Edinb 2017; 47: 331–5 | doi: 10.4997/JRCPE.2017.405 PAPER

The increasing burden of atrial fibrillation in acute medical admissions, an opportunity to optimise stroke prevention

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Abstract

Background Atrial fibrillation is a major risk factor for ischaemic stroke. We investigated whether active screening for atrial fibrillation in secondary care, followed by careful evaluation of risk factors and communication to general practitioners from stroke specialists, could increase appropriate anticoagulation prescription.

Methods Between 1/9/14 and 28/2/15 all acute medical admissions were screened for atrial fibrillation at Cambridge University Hospital. Individualised letters were sent to the general practitioners of patients who it was felt would benefit from anticoagulation.

Results In total, 847 patients with atrial fibrillation (15% prevalence, 52% female, median age 81.9 years, median CHA_2DS_2–VASc 4.4) were identified; 671 (79.2%) had known atrial fibrillation, and 176 (20.8%) were diagnosed on admission. After screening and identifying 'at risk' patients, 112 individualised letters were sent to GPs. A 91% response rate was achieved, resulting in an additional 43 individuals being appropriately anticoagulated.

Conclusions Atrial fibrillation prevalence is significantly increasing among acute hospital admissions; these patients have high risk of cardioembolic stroke. Careful screening and identification in secondary care can lead to improved rates of anticoagulation.

Keywords: anticoagulation, atrial fibrillation, screening, stroke, stroke prevention

Declaration of interests: II is supported by a British Heart Foundation Cambridge Centre of Research Excellence Clinical Research Training Fellowship. KK has received speaker honoraria from Boehringer Ingelheim and travel grants from Boehringer Ingelheim, Bayer and Pfizer.

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Introduction

Atrial fibrillation (AF) is the most common and clinically relevant cardiac arrhythmia, particularly in the elderly. It is estimated that 33.5 million people worldwide[1] and 1.36 million in the UK[2] have AF; however, this is certainly an under-estimation due to the absence of routine screening services to enable accurate detection and quantification. Cardioembolic stroke constitutes a large financial burden on health services, conferring a 2-fold increase in median total healthcare costs compared to other stroke types[3] due to its severity, as well as increased morbidity and mortality. Therefore, because of the ageing population, AF will remain a growing cause of substantial healthcare expenditure in the future unless efforts are made to optimise stroke prevention at both primary and secondary care level.

The risk of AF-associated stroke can be substantially reduced by using oral anticoagulation (OAC);[4] appropriate treatment could prevent 4,500 strokes and 3,000 deaths each year in the UK.[5] Existing scoring systems such as the CHA_2DS_2-VASc (which assigns 1 point where there is a history of congestive cardiac failure (C), hypertension (H), diabetes mellitus (D), vascular disease (V), age ≥ 65 years (A) and female sex (Sc), and 2 points if age ≥75 years (A2) or there is a history of prior stroke/transient ischaemic attack (S2)) identify those that are at high risk of cardioembolic stroke and can guide clinicians in starting OAC.[6] Despite this, 40–60% of those eligible are not receiving OAC, usually due to patient and physician concerns about the perceived bleeding risk, leading to poor rates of prescription and compliance.[7–9]

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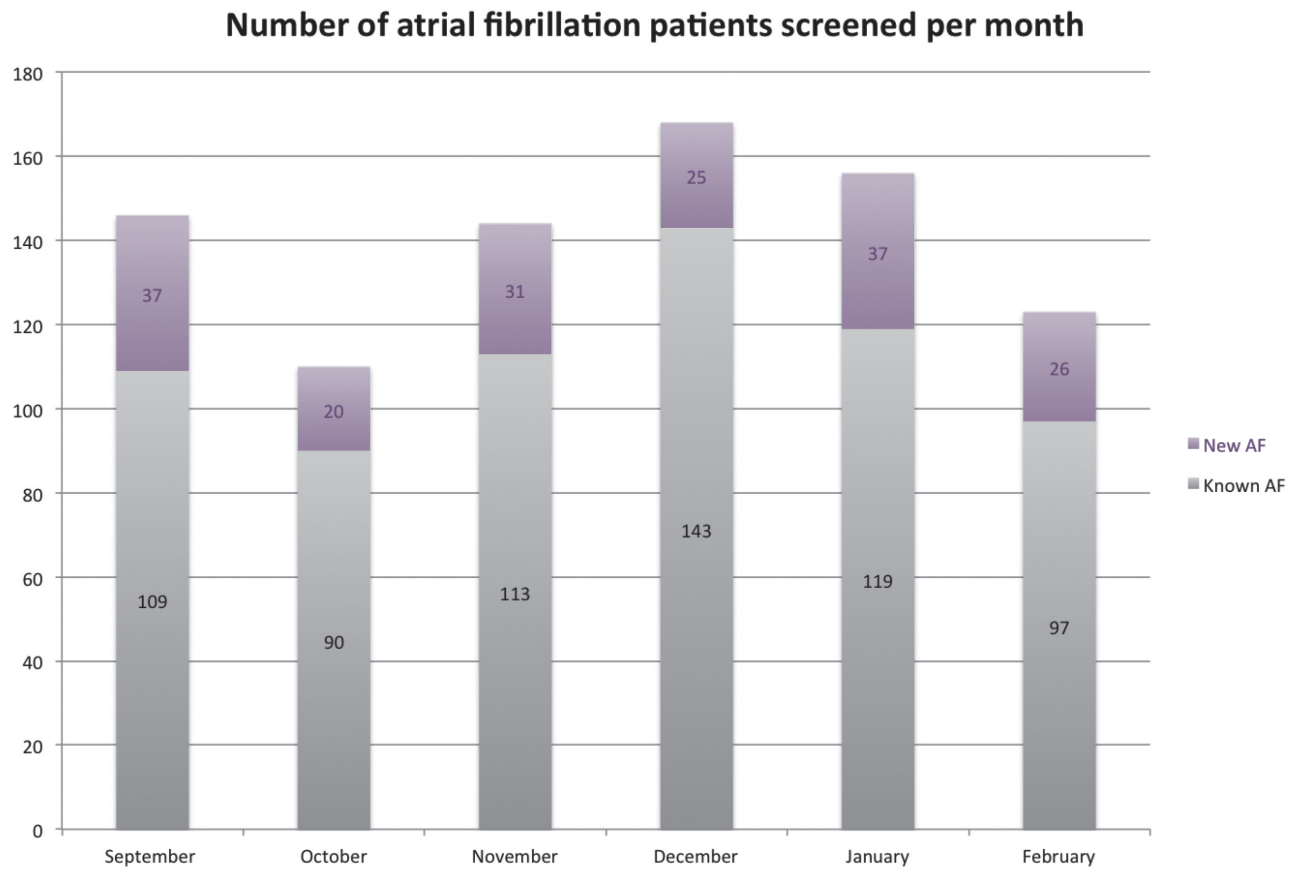
Figure 1 On average, one new case of atrial fibrillation (AF) was discovered through screening each month, highlighting the importance for active screening for atrial fibrillation in secondary care



Secondary care is often an underutilised resource for screening patients who have AF and remain at high risk of stroke. We designed a prospective screening study to look at the prevalence of AF in patients admitted acutely to hospital. In addition, we evaluated how primary care can be supported in managing patients at risk of cardioembolic stroke by providing specialist decision-making input regarding anticoagulation.

Materials and methods

Data collection

The study was carried out at Cambridge University Hospital, a large teaching hospital serving Cambridgeshire and surrounding counties. The hospital receives approximately 1,300 acute medical admissions per month. Study inclusion criteria were: i) acute (non-elective) admission under a general medical team between September 2014 and February 2015, and ii) history of permanent or paroxysmal AF, or a new diagnosis of AF.

Screening was performed by a trained stroke prevention nurse, supported by a consultant or specialist registrar in stroke medicine. All medical patients admitted on a weekday, a total of 5,700, were screened for AF using their admission 12-lead ECG and patient medical notes. Patient

Table 1 Demographics data. Basic demographics of the patients screened into the study

	n (%)
Total no. of patients	847
Median age	81.9
Female	443 (52.3)
Congestive cardiac failure	279 (32.9)
Hypertension	559 (66)
Diabetes mellitus	193 (22.8)
History of TIA/stroke	261 (30.8)
Vascular disease	302 (35.7)
Median CHA_2DS_2-VASc	4.4
Deaths as inpatient	126 (14.9)
Discharged for end of life care/died during data collection	35 (4.85)

TIA, transient ischaemic attack

Table 2 Breakdown of screened patients as well as atrial fibrillation (AF) encountered by month

	September	October	November	December	January	February	Total
Total no. AF patients	146	110	144	168	156	123	**847**
Known AF	109	90	113	143	119	97	**671**
Known AF: Died during admission	14	8	12	30	18	12	**94**
Known AF: On OAC on admission	68	53	57	74	69	53	**374**
Known AF: Not on OAC on admission	41	37	56	69	50	44	**297**
Known AF: Not on OAC and died as inpatient	6	4	7	17	12	4	**50**
Known AF: OAC newly started on discharge	6	8	9	14	8	9	**54**
Known AF: OAC stopped before discharge	2	9	9	11	5	5	**41**
Known AF: Not on OAC and discharged without OAC	29	25	40	38	30	31	**192**
New AF	37	20	31	25	37	26	**176**
New AF: Died during admission	4	1	10	4	9	4	**32**
New AF: On OAC on admission	0	1	1	1	1	0	**4***
New AF: OAC newly started on discharge	9	11	11	8	6	12	**57**
New AF: Not on OAC at discharge	24	8	10	12	21	10	**85**

*4 new AF patients were already on anticoagulation, 2: pulmonary embolism/chronic thromboembolic disease, 2: metallic mitral valve. OAC, anticoagulation.

demographic data, admission information, details of their OAC status, and eligibility for OAC were collected. CHA_2DS_2-VASc scores were calculated on all patients. An appointed administrator ensured rigorous data collection and facilitated communication with primary care.

Data analysis

Data were analysed by experienced stroke physicians. HAS-BLED[10] scores were not collected because variables shared with CHA_2DS_2-VASc (hypertension, history of stroke and age) meant certain cohorts of patients, especially the elderly, scored parallel in both scoring systems. Patients not on anticoagulation on admission and not discharged on anticoagulation were identified, as well as the anticoagulation status of newly diagnosed AF patients on discharge. Their medical notes, including previous inpatient and outpatient correspondence, were then carefully inspected for contraindications to OAC use, any previous history of OAC use or discussions about anticoagulation. For patients at high risk of stroke, with no obvious contraindications to OAC, individualised letters, based on the information in medical records, were sent to general practitioners (GPs) highlighting the patient's CHA_2DS_2-VASc score, annual stroke risk and the potential benefit from initiation of OAC. Responses from GPs were recorded, and for those who did not respond a follow up phone call was carried out 6–8 weeks later.

Table 3 Main reasons supplied from primary care for not starting OAC after recommendations from screening suggest that patient education, counselling and autonomy for informed decision making is of highest importance

Reason given	No. of responses
Patient declined anticoagulation	12
Bleeding risk	10
Falls	9
Primary care requested further clarification	6
Pending further investigation/ referrals (haematology, cardiology advice or gastrointestinal investigations)	5
Frailty	3
Life-limiting illness	3
Alcohol excess	2
Paroxysmal atrial fibrillation	2

Results

Between September 2014 and February 2015, a total of 847 patients were identified with AF on admission under the care of a medical team; 52.3% were female (443/847) and the median age was 81.9. Of these, 671 (79.2%) had an existing diagnosis of AF, and 176 (20.8%) had a new diagnosis of AF. The average CHA_2DS_2-VASc score was 4.4 with only 6 (0.7%) patients having a CHA_2DS_2-VASc score of 0 (Table 1). Figure 1 shows the number of AF patients screened per month.

Anticoagulation rates

Of patients with known AF, 56% (374/671) were on anticoagulation at the time of admission. Of the remaining 44% not on OAC at the time of admission and excluding those who died, 78% (192) were discharged from hospital without initiation of OAC. Only 42% (61) of newly diagnosed AF patients were started on OAC on discharge. Fifteen percent (126/847) died during their inpatient stay (Table 2).

Communication with primary care

A total of 301 patients were found not to be on anticoagulation over the 6-month period. After reviewing each patient's medical notes, we concluded that 189 (62.8%) of these patients were not suitable for OAC. The main reasons we encountered were i) a decision made not to anticoagulate by the admitting team after discussion with the patient and/or family, ii) a clear refusal by the patient with capacity documented in the notes, iii) life-limiting illnesses such as end-stage cancer or discharge for end-of-life care, iv) significant frailty, disability and dependence, or advanced dementia, v) obvious contraindications to anticoagulation such as previous major bleeding on OAC, history of spontaneous haemorrhagic stroke or a high bleeding risk due to comorbidities such as chronic liver disease, vi) substantial risk of multiple falls with head injury, e.g. in heavy alcohol abuse.

For the remaining 112 patients, we sent individualised letters to their GPs highlighting that anticoagulation should be considered, unless there was a reason that was not clear in the medical notes. The final decision to start start OAC or not and the choice of OAC was left to the GP after discussion with the patient. We received 102 responses (91%) from primary care, with an additional 43 patients (38.4%) being commenced on OAC (26 warfarin, 17 direct OAC). The most common reasons given for not starting the patient on anticoagulation from primary care were patients declining OAC (11.7%), perceived bleeding risk (9.8%) and falls (8.8% (Table 3). Reassuringly, paroxysmal AF (1.9%) was rarely quoted.

Discussion

The most striking finding from our study is the huge increase in the burden of AF among acute medical admissions. Based on the weekday screening programme in our project, the rate of AF identified in acute medical admissions was 15%, which is three times previous estimates[11,12] of 3–6%. In addition, the mean age of acute medical patients has risen from 74.4 to 81.9 years. Further highlighted is the increasingly frail and dependent population that are currently cared for in hospital; our AF cohort had an inpatient death rate of 15%, with a further 5% being discharged for end-of-life care or dying during data collection. This demographical shift to a frailer, more elderly population with higher rates of AF and other comorbidities makes OAC decisions even more challenging.

We believe that screening for AF and optimising stroke prevention in secondary care patients is an effective strategy. In our population only 0.7% of patients were truly low risk. The median CHA_2DS_2-VASc score was 4.4, emphasising that this population has multiple comorbidities and is at high risk of cardioembolic stroke. In addition, on average one new AF diagnosis was made per day, further highlighting the importance of screening in hospital. Our screening came at no extra cost in terms of investigations as all acute medical admissions have an ECG or cardiac monitoring, enabling good and reliable pickup rates of AF.

Our study highlights continued under-utilisation of OAC in high-risk AF patients in both primary and secondary care, echoing results of previous studies.[8,13,14] Our written communication to primary care led to 43 more patients over 6 months being commenced on anticoagulation, highlighting that primary care physicians do value the opinion of a specialist regarding difficult decisions. However, it is clear that a reluctance to start OAC remains. From the GP feedback we received, the three most common reasons for not starting OAC were patient choice, bleeding risk and falls. These factors can be addressed by education and increasing awareness on stroke risk for the physician and patient. It is important to emphasise that even in the older population, the net benefit of OAC in stroke prevention is maintained.[15] Despite results from large randomised trials such as BAFTA (Birmingham AF Trial in the Aged), which suggest no significant increase in haemorrhage rates using warfarin compared to aspirin,[16] evidence suggests that clinicians tend to over-estimate the risk of bleeding[9,17] especially from falls.[18] It is well known that a patient should have a substantial number of falls for the risk of traumatic intracranial bleed to outweigh the benefits of OAC.[17] Importantly, studies suggest that some patients are prepared to experience four major bleeds simply to prevent one stroke.[19] This heterogeneity in the patient population further highlights the need for an individualised decision making approach which must incorporate a balanced discussion of benefits and risks, with full involvement of patient and family.

There were some limitations to our study. Given that this was a prospective study only looking at acute medical admissions on weekdays, as well as the fact that we could not identify patients who developed AF during their inpatient stay, means that the true burden of AF in our population is underestimated. However, our results originate from a large teaching hospital serving a wide community and as such are likely to reflect the situation generally in the UK. Furthermore, the stroke prevention nurse dedicated 20 hours per week to screening of the patients, meaning all the new medical

admissions on a weekday were rigorously reviewed. The quality of medical notes and clinic letters were also good, which allowed us to make a reasonable judgement regarding the suitability of patients for OAC. However, we believe that if we have the opportunity to evaluate and consult patients ourselves, to provide clear and consistent advice, in close partnership with the admitting medical team, this could increase anticoagulation rates and compliance. This is the next step in our project.

Conclusions

AF is a 'hot topic' worldwide due to its increasing prevalence. It is both under-diagnosed and undertreated; therefore, multiple strategies to optimise stroke prevention are being investigated. Our work demonstrates that every opportunity should be used to screen for AF and implement appropriate stroke prevention measures as, without effective detection and prevention, many patients will only be identified after having had a cardioembolic stroke. Patient feedback from studies confirm that they want to actively acquire the knowledge that can be provided by stroke specialists in order to be involved in decision making.[20] Therefore, striving to improve patient knowledge and clarity about AF may alleviate some of the concerns faced when discussing OAC. With a large increase in the burden of AF in acute admissions, and an ageing population, we believe that secondary care can play a valuable role in optimising stroke prevention in AF patients. Secondary care screening for AF targets a high risk population, is accurate and cost-effective, and enables us to critically look at barriers to anticoagulation, as well as allowing a more efficient and collaborative approach to support primary care colleagues in reducing risk of cardioembolic strokes.

Funding

This work was supported by Boehringer Ingelheim who contributed to Cambridge University Hospitals stroke research fund to free up part of EA's time to concentrate on this project.

Ethical approval

This study was part of a Service Evaluation Audit registered with our center's Safety and Quality Support Department. Formal confirmation was received that approval from the ethics committee was not required.

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