

Atrial fibrillation: estimated increased rate of stroke due to lacking adherence to guidelines

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Summary

Questions under study: Many patients with atrial fibrillation (AF), risk factors for stroke and no obvious contraindications do not receive oral anticoagulation. Estimations of the increased rate of stroke due to neglected anticoagulation, particularly in an elderly, non-selected population, are unknown.

Methods: Consecutive patients with paroxysmal or permanent atrial fibrillation admitted to the medical or surgical department of our hospital for any reason were studied. Risk factors for stroke and contraindications for anticoagulation were recorded. Estimations of the increased rate of cerebrovascular events due to neglected anticoagulation were based on data of a large meta-analysis. Patients were further stratified into different age and risk groups.

Results: 484 patients with a mean age of 75 (12) years were studied, 45% were female. 237 patients

had no oral anticoagulation at hospital discharge, despite guideline recommendations. Contraindications for anticoagulation were found in 85 (36%) of these patients, resulting in 152 patients with neglected anticoagulation (31% of all patients with AF). We estimated that, if all those patients would have been treated according to guidelines, 7.4 strokes per year could be prevented in the study population. The estimated rate of preventable events was 4.9%/year (7.4/152).

Conclusions: With better adherence to guidelines for oral anticoagulation in patients with atrial fibrillation and risk factors for stroke, a significant number of strokes could be prevented.

Key words: atrial fibrillation; stroke; oral anticoagulation; increased rate; risk factors; guidelines

Introduction

Atrial fibrillation (AF) is the most common cardiac arrhythmia. In a non-selected population, the prevalence of AF is approximately 0.7% and it increases to 9% in patients over the age of 80 [1–3]. There is a marked gender difference [4] with men more often affected than women (1.1–2.2% and 0.7–1.7%, respectively).

AF is an independent major risk factor for thromboembolic events, mainly stroke and transient ischaemic attacks [5]. Patients in AF have a five-fold increased stroke risk compared to patients in sinus rhythm [6]. Stroke patients who are in AF are characterised by a higher mortality, a prolonged hospitalisation time and a worse functional outcome [7, 8].

A meta-analysis of five large randomised trials has shown that the annual stroke risk can be lowered to 1.4% with oral anticoagulation compared

to 4.5% in control patients without therapy [9]. The annual risk of major bleeding in these patients was low (1.3% and 1.0%, respectively) and thus does not offset the benefit of oral anticoagulation.

In spite of all data favouring anticoagulation and clear-cut guidelines [10], many patients with AF and no obvious contraindications do not receive anticoagulation. Estimations of the increased rate of stroke due to neglected anticoagulation, especially in an elderly non-selected population are missing. The two aims of the present study were, 1) to determine the adherence to anticoagulation guidelines in a large teaching hospital at the time of discharge, reflecting the quality of care of our physicians, and 2) to estimate the increased rate of stroke as a consequence of neglected anticoagulation in a non-selected population admitted to a hospital for any reason.

¹ Equal contribution.

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Methods

During a nine-month-period (January to September 2000) all patients admitted to the surgical and medical wards of the University Hospital of Basel with a diagnosis of paroxysmal or permanent AF were selected based on the corresponding ICD-10 codes in the hospital discharge letter and/or the ECG documentation. Presence or absence of oral anticoagulation at discharge was assessed. Risk factors for thromboembolic events and contraindications for oral anticoagulation were analysed based on a thorough review of medical charts. Risk factors, defined according to the CHADS-score [11], were: 1) age over 75 years, 2) hypertension, 3) documented structural heart disease, 4) diabetes and 5) a history of thromboembolic events. For the present study a history of gastrointestinal or intracranial bleeding, recurrent syncope or falls, presumed mal-compliance (drug non-compliance, alcohol abuse, dementia) and poorly controlled blood pressure (>220/110 mm Hg) were considered as relevant contraindications. Patients with significant valvular heart disease or artificial heart valves were excluded. We defined three age groups of a) under 65 years, b) 65 to 75 years and c) over 75 years

and divided these groups in subgroups with or without additional risk factors. As guidelines [10] do not differentiate between paroxysmal and permanent AF regarding the indication to anticoagulate a patient and since their risk rates are similar [12], this additional stratification was not made.

Calculations of the increased rate of cerebrovascular events due to neglected anticoagulation were based on data of the above-cited meta-analysis [9]. In this analysis, the absolute risk reductions between patients with or without oral anticoagulation were 0%, 3.2% and 1.8% in the three age groups without additional risk factors and 2.8%, 4.0% and 6.9% in those with additional risk factors per year, respectively.

Statistics

Continuous data are expressed as mean values (standard deviation). Analyses were done using StatView software package version 5.0 (SAS Institute Inc., Cary, NC/USA) and Microsoft Excel.

Results

484 patients were included, mean age was 75 (12) years. 45% were female. Risk factors for stroke were hypertension in 60%, structural heart disease in 35%, diabetes in 28% and a history of any thromboembolic event in 16% of patients. 17% of patients were younger than 65 years, 31% were between 65 and 75 years of age and 52% were older than 75 years. Antiarrhythmic drug therapy consisted of beta-blockers in 21%, amiodarone

in 9% and other antiarrhythmic drugs (verapamil, digoxin ...) in 30%. AF was permanent in 58% of patients and paroxysmal in the remainder. 43% of patients were admitted for cardiac causes.

Overall 237 patients (49%) did not receive oral anticoagulation, despite guideline recommendations. The percentages of patients who were not treated according to guidelines, stratified by age and the presence of additional risk factors, are

Table 1
Percentage of patients without anticoagulation, stratified to age and additional risk factors.

age	without additional risk factors apart from age	with additional risk factors apart from age
below 65 years	76% (26/34 patients)	42% (20/48 patients)
65 to 75 years	48% (13/27 patients)	57% (69/122 patients)
above 75 years	72% (34/47 patients)	55% 114/206 patients)

Grey shaded oblongs signify that anticoagulation is recommended according to [11].

Table 2
Estimated increased rate of stroke due to neglected anticoagulation in patients without contraindication

age	without additional risk factors apart from age	with additional risk factors apart from age
below 65 years	RR: 0%	RR: 2.8%
	n: 24	n: 16
	ES: 0	ES: 0.5
65 to 75 years	RR: 3.2%	RR: 4.0%
	n: 9	n: 46
	ES: 0.3	ES: 1.8
above 75 years	RR: 1.8%	RR: 6.9%
	n: 22	n: 68
	ES: 0.4	ES: 4.7

RR = Reduction of annual risk of stroke (per 100 patients treated) with the risk for intracranial bleeding already subtracted (9)

n = Number of patients in each age and risk group

ES = Estimated number of excess strokes per year in each age and risk group

Table 3

Contraindication to anticoagulation in 85 patients.

History of repeated falls	37 (44%)
Presumed malcompliance	29 (34%)
History of gastrointestinal bleeding	11 (13%)
Uncontrolled hypertension	5 (6%)
History of intracranial bleeding	3 (3%)

shown in detail in table 1. The percentage of unvalued therapy in the different groups was between 42% and 72%. In those 22 patients who were on anticoagulation, although guidelines do not recommend it, other medical conditions (eg a history of pulmonary embolism) were the reason for anticoagulation.

Discussion

In this large cohort of almost 500 non-selected patients with a history of paroxysmal or permanent atrial fibrillation, 49% were not treated with oral anticoagulation, despite current guideline recommendations [10]. Only approximately one third of them had relative or absolute contraindications for anticoagulation. The other 31% of patients were not correctly treated. This resulted in an estimated increased rate of stroke of almost 5% per year in this subgroup of patients, the potential adverse effect of life-threatening bleeding already subtracted.

Several epidemiological studies have been published on the percentage of patients with AF who are actually treated with oral anticoagulation (summarised in [13]), the overall rate being less than 30%. This contrasts with the higher rate of patients treated correctly in our cohort, but might in part be explained by the fact that most of these studies were performed in the mid-nineties, when convincing data regarding the usefulness of oral anticoagulation were not yet published.

The risk of cardioembolic stroke in the presence of atrial fibrillation is markedly influenced by risk factors such as increasing age, hypertension, structural heart disease, diabetes and a history of cerebrovascular events. Without oral anticoagulation, the annual risk of cardioembolic stroke in a patient older than 65 years without structural heart disease, is 2%. Hypertension, diabetes and a history of stroke increase the risk to 7%, 8% and 15% respectively [14]. Due to the relatively small sample size in the subgroups, we were not able to perform these calculations in our cohort.

77% of our patients had at least one additional risk factor such as arterial hypertension. Overall, the incidence of the different risk factors was much higher than in the meta-analysis [9] taken as the basis for our calculation (eg 60% of our patients had an arterial hypertension compared to 46% of the meta-analysis patients and 18% had a history of stroke compared to only 6%, respectively).

The highest rate of neglected anticoagulant

Contraindications to anticoagulation were determined in 85 of the 237 patients (36%). The corresponding numbers are given in table 2. Anticoagulation was neglected in 152 patients (31%), who should have been treated and had no obvious contraindication.

The theoretical risk of stroke in our population of 152 patients with neglected oral anticoagulation was 7.4 or 4.9% (table 3). The highest impact to this number came from the subgroup of 68 patients aged 75 years or older with additional risk factors for stroke. This patient group accounted for 45% of all patients with neglected anticoagulation and had by far the highest statistical risk of stroke (6.9% per year).

treatment despite clear indication was found in patients over the age of 75, which also resulted in the highest estimated increased rate of cerebrovascular events. A common argument to withhold oral anticoagulation in these elderly patients is the fear of major, in particular intracranial bleeding. In our retrospective study this issue could not be addressed. However, several recent studies reported a very low incidence of intracranial bleeding with rates in the range of 0.2% after 90 days of treatment [15], 1% after one year [16] and 5% after five years [17], respectively. A majority of these events occurred during the first three months of therapy [16]. In three randomised trials, higher age was not an independent predictor for haemorrhage [15, 16, 18]. In one study, the relative risk was marginally (1.03%) elevated [16].

Another often-quoted argument is non-compliance [19] of elderly patients, but data supporting this issue are missing. In contrast, there is strong evidence that rather doctors than patients underestimate the risk of stroke in their patients and overestimate the risk of severe bleeding [20, 21].

Limitations

There are several limitations regarding the study. First, our analysis is based on stroke rates of a meta-analysis of a population with a different amount of risk factors. Second, the results primarily reflect the poor quality of adherence to guidelines in our hospital. However, we assume that this quality might be similar in other teaching hospitals. Third, potential contraindications were identified according to patient records and not by directly asking the treating physicians. This might have adversely influenced our estimation of its number. Finally, data were assessed in 2000, but as guidelines did not undergo major revision since then, our conclusions are still relevant in 2006.

Clinical implications

The theoretical risk of stroke in the study population of patients with neglected oral anticoagula-

tion is 4.9%/year, which could be prevented if doctors would follow guidelines more precisely. This is particularly important in older patients, who are at highest risk for stroke and who would benefit most from oral anticoagulation. In this group of patients anticoagulation is often withheld for fear of intracranial bleeding, an adverse event ten times less frequent than stroke.

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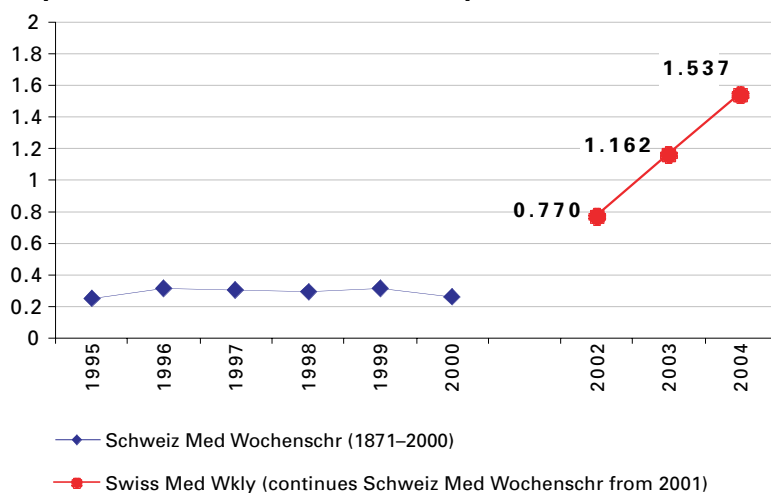
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