Differences in attitude, education, and knowledge about oral anticoagulation therapy among patients with atrial fibrillation in Europe: result of a self-assessment patient survey conducted by the European Heart Rhythm Association

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The purpose of this patient survey was to analyse the knowledge about blood thinning medications relative to gender, age, education, and region of residence in patients with atrial fibrillation (AF). A total of 1147 patients with AF [mean age 66 ± 13 years, 529 (45%) women] from eight European countries responded to this survey. Most patients understood that the indication for anticoagulation therapy was to ‘thin the blood’, but 8.1% responded that the purpose of the medication was to treat the arrhythmia. Patients with college or university grades reported less frequent deviations from their target INR range compared with those without schooling (2.8% vs. 5.1%, P < 0.05). The awareness of anticoagulation-related risk of bleedings was lowest in patients without schooling (38.5%) and highest in those with college and university education (57.0%), P < 0.05. The same pattern was also observed regarding patient’s awareness of non-vitamin K antagonist oral anticoagulants (NOACs): 56.5% of the patients with university education and only 20.5% of those without schooling (P < 0.05) knew about NOACs, indicating that information about new anticoagulation therapies remains well below the target. Bleeding events were statistically less frequent in patients on NOACs compared with vitamin K antagonists. The education level and patients’ knowledge have a direct influence on the global management of the anticoagulation.

Keywords

Atrial fibrillation • Stroke • Anticoagulation • Vitamin K antagonists • Non-vitamin K oral anticoagulants • Patient awareness • EHRA survey

Introduction

Oral anticoagulation (OAC) is the most effective therapy for the prevention of ischaemic stroke or systemic embolism related to atrial fibrillation (AF).1,2 The greatest clinical benefit of OAC is achieved with active close collaboration between physicians and AF patients at risk of stroke.1,2 Shared decision making regarding the initiation of OAC, as well as long-term adherence to OAC therapy are facilitated by informed patient participation in the process of treatment.

Medical management of patients with AF is continuously improving due to the adoption to guidelines with better risk stratification, and perhaps better adherence to therapy, including non-vitamin K oral anticoagulants (NOACs). The way of transmitting the
knowledge may have important implications for the adherence to
guidelines and treatment outcomes. There may be regional differ-
ences regarding OAC use, although less is known about the patient’s
education and knowledge in different countries.

The purpose of this European Heart Rhythm Association (EHRA)
survey was to analyse the knowledge and attitude towards throm-
bo prophylactic medications in relation to gender, age, education,
and region of residence among AF patients.

Methods

The survey was designed and approved by the members of the EHRA
Scientific Initiatives Committee in collaboration with the French National
College of Cardiologists (CNCH), as previously described.3 The un-
derstanding and ease of use of the survey questionnaire was tested in
advance in clinical practice to obviate misinterpretations by participating
patients. The questionnaire, consisting of 40 questions in patients’ native
language, was created on an online electronic platform, and the link was
sent to the EHRA Electrophysiology (EP) Research Network centres.
The countries invited to participate were France, Denmark, Sweden,
Spain, Norway, Germany, Italy, and the UK, all of which had country co-
ordinators in the Scientific Initiatives Committee. The EP Research Net-
work centres were instructed to approach hospitals, outpatient clinics,
and specific patient associations or organizations. In-hospital and outpa-
tients diagnosed with AF and taking OAC were eligible. Each patient was
asked to enter their individual data without any interference from med-
icial staff. All data were collected anonymously, and the study was con-
ducted during a 3-month period.

Statistical analysis

Values are expressed as mean ± standard deviation for continuous data
and as numbers or percentages for categorical data. Distributions of cat-
egorical data were examined by the χ² test or Fisher’s exact test, as ap-
propriate. Continuous data were compared using Student’s t-test or the
Mann–Whitney U test, as appropriate. The normal distribution of data
was tested using the Kolmogorov–Smirnov and Shapiro–Wilk tests.
The analyses were performed using SPSS software for windows, version
19.0 (IBM Corporation, Armonk, NY, USA).

Results

Patient population

Of 1147 patients participating in the survey, 529 (46.1%) were wo-
men; mean age was 66 ± 13 years. The patients were from France
(386 patients, 33.6%), Denmark, (305, 26.6%), Sweden, (240,
20.9%), Spain (88, 7.7%), Norway, (51, 4.5%), Germany (43, 3.7%),
UK, (25, 2.2%), and Italy (9 patients, 0.8%).

The survey contained the question whether a patient had an on-
going ‘blood thinning’ medication or not, and which of the listed
‘blood thinning’ agents the patient was currently taking, including
country-specific trade names of anticoagulants and antiplatelet
agents. There were no differences in NOAC use with respect to
age or gender. A total of 160 men (25.8%) and 123 woman
(23.9%) were treated with NOAC (P = 0.42). The use of specific
anticoagulants differed across Europe. Among the vitamin K antago-
nists (VKA), warfarin was most frequently used in Denmark, Ger-
many, Norway, Sweden, and UK than in France or Spain (88% in
Norway vs. 4.7% in Spain), while acenocumarol was most frequently
used in Spain (91.2%); and fluindione in France (77.1%) (P < 0.05).

Aspirin as an antiplatelet agent was most commonly used in Norway
(22%) and lowest in France (7%) (Figure 1). The use of clopidogrel,
prasugrel, or ticagrelor was similar.

The use of VKAs, NOACs, and antiplatelet agents reported by pa-
tients differed across the countries. There were also regional differ-
ences regarding the preference of a certain NOAC or anticoagulant
as reported by patients participating in this survey. Dabigatran was
more frequently used in Denmark and Sweden, apixaban was more
frequently used in Germany, and rivaroxaban was preferred in
France, Spain, and Norway.

Knowledge of oral anticoagulation and the
need for monitoring

When patients were asked about the purpose of their anticoagula-
tion medication, the majority (91–94%) reported that the indication

![Figure 1](https://academic.oup.com/europace/article-abstract/18/3/463/2398866/464) Differences in anticoagulation and antiplatelet therapies by country. Data are shown in percentage.
for anticoagulation therapy was to ‘thin the blood’. However, a non-negligible proportion of patients (6–9%) replied that the treatment was to control the arrhythmia. Regarding adherence to therapy, 28.7% of men and 24.5% of women (P < 0.05) reported forgetting to take their medication occasionally; younger patients were more likely to forget their medication than patients over 65 years (31.3 vs. 24%, P < 0.05).

The frequency of blood tests for monitoring of OAC therapy did not differ across countries, and monthly testing was most common. When asked about their INR targets, 91% knew that the INR target level should be kept between 2 and 3, while 3% believed it should be < 2, and 6% believed that the target INR should be > 3.

Most of the patients state they can continue their normal daily life activities, such as travelling by plane, participating in sport, driving a car or having a job, being more frequently acknowledged by men than by women (P < 0.05).

Discontinuation of anticoagulation was reported by 14.5% of participants. The reason for the withdrawal of therapy was unknown in 25.8% of the younger patients and 21.1% of the older individuals (P < 0.05), while the second most common reason was discontinuation by their doctors (8.9% in younger and 11.8% in older patients, P < 0.05), and the third most common cause was that the patient did not want regular blood test.

Of the entire cohort, 40% of the patients were informed of the availability of NOACs. However, many patients were not aware of the fact that blood tests were not necessary for testing the efficacy of NOACs. (29.6% men and 32.7% women). A minority of the patients (25.8% of men and 28.4% of women) recognized that NOACs were at least as effective as warfarin (Table 1). The knowledge about the need for regular kidney function tests and to a certain extent liver function monitoring, and potentials interactions with other drugs, which should be avoided, generally was low, ranging between 15 and 38%, particularly in patients who were not on NOACs.

Role of education

The use of aspirin was reported by 10.1–20% of the patients, most frequently by those with some college credit and less commonly by patients with college or university education and patients with nursery school to 8th grade patients. The use of NOACs ranged from 29.5% in patients with some college credit to 17.9% in patients without schooling (P < 0.05).

The educational level did not differ between patients who were aware of the purpose of the OAC therapy ‘to thin the blood’ and those who believed that the drugs were used for the arrhythmia per se. Patients with a high educational level (college or university degree) more frequently managed their dosing themselves compared with other groups (21.9 vs. 12.9% in patients without schooling; P < 0.05). Patients have also been asked whether INR ever go higher than the upper limit of the target level. Patients without schooling were more likely to report that INR exceeded the upper limit several times a month (5.1 vs. 2.8% of college or university-educated patients, P < 0.05).

The majority (80.2%) of patients with university education knew that they could continue their normal daily activities such as travelling by plane, sports, driving a car, or having a job, compared with patients without schooling (51.8%, P < 0.05).

A higher proportion (56.5%) of patients with university education have heard about NOACs as opposed to only 20.5% of patients without schooling (P < 0.05); thus, this awareness remains relatively low; 15.3% of the patients without schooling did not know that blood tests were not necessary for NOACs, in contrast to what was required for warfarin. The fact NOACs are at least as effective as warfarin was recognized by 2.5% of patients without schooling and 25% of patients with trade/technical education, and up to 42.4% of patients with university education (P < 0.05).

Patients without schooling reported the highest rate of bleeding on anticoagulant, and the highest rate of previous stroke (2.6% as compared with 0.7% in those with college and university education, P < 0.05) (Table 2). These patients also had the lowest use of VKAs or NOACs for prevention of stroke, even after correction for other possible factors that may influence appropriate OAC therapy. The use of NOACs was also less frequent, than the use of VKAs, ranging from 17.9% in patients without schooling to the 25.8% in patients with college or university education and 29.1% in patients with some college credit.

Bleeding events

History of bleeding was reported by 13% of patients. More than half the patients (54%) declared that anticoagulation was associated with increased risk of minor bleeding, while 26% believed that it increased risk of all bleedings (including major bleeding). The perception of low risk of anticoagulation, as well as the perception of no risk at all, was...
Despite the widespread guidelines on management of AF, knowledge, education, and compliance regarding OAC therapy. In our survey, there were no significant differences in the management of OAC treatment by gender, apart from the observation that men more frequently than women managed the dosing themselves.

Gender-related differences in the clinical presentation and outcome seem to relate to differences in platelet biology and coagulation reactions, resulting in different rates of thromboembolic and bleeding events, according to previous studies. However, the understanding and management of anticoagulation could also be important. Similar proportions of men and women discontinued anticoagulation therapy, which was most frequently related to the advice from their doctors. In our survey, there were no significant differences in the management of OAC treatment by gender, apart from the observation that men more frequently than women managed the dosing themselves.

This survey provides some insights into the current patient’s knowledge, education, and compliance regarding OAC therapy. Despite the widespread guidelines on management of AF, there are significant regional differences regarding age, gender, country, and educational level among AF patients across Europe. The EHRA Practical Guide for NOAC use recommends mandatory regular monitoring of renal function on a yearly basis in patients with normal or mild renal impairment and more frequently in patients with moderate renal impairment. Widespread education programmes on AF and anticoagulation are needed for physicians, as well as user friendly patient educational material to overcome regional differences in OAC therapy.

The prospective study by Poli et al. found no differences regarding the quality of anticoagulation or bleeding risk between the genders. The NOAC use ranged from 31.9% in Swedish patients to 8.2% in Norway in our survey. There were regional differences regarding the preference for certain anticoagulants. Dabigatran was more frequently used in Denmark and Sweden, apixaban in Germany, and rivaroxaban was more frequently used in France, Spain, and Norway. These differences may be difficult to interpret, but could at least in part be related to problems in introducing a new product into the market by each government and also due to differences in reimbursement among countries.

Temporary VKA discontinuation and bridging with other anticoagulants was frequent, and time in the therapeutic range defined as at least two of the last three available INR values between 2.0 and 3.0 prior to enrolment, ranged from 70.3% in Spain to 81.4% in Germany. The global quality of anticoagulation management was relatively homogenous across countries.

Educational differences

Patients with the highest educational level were more frequently treated with NOACs (29.5% in patients with some college credit to 17.9% in patients without schooling). The continuance of OAC therapy may be affected by diet modifications, other drugs, co-morbidities, compliance, and patient education. In our survey, there were important education-related differences regarding information given about anticoagulation, management, and permitted patient activities. Even among university-educated patients not all knew about NOACs. The perception of risk imposed by anticoagulants was also different.

The study on patient’s education with respect to OAC therapy showed that a greater emphasis should be given to educational courses for anticoagulated patients; administration of the questionnaire leads to a significant improvement in anticoagulation quality. Educational interventions significantly influence the patient’s knowledge and perception of AF. Other surveys emphasized the need for structured educational programs to improve the use of OAC. Recently, an EHRA consensus document emphasized the need for education of patients with AF.

Conclusion

The differences in the educational level may compromise the safety and efficacy of anticoagulants. The results of this survey show that there is still a place for improvement of education and compliance among patients on OAC. Education of AF patients should be
reinforced to improve anticoagulation in clinical practice. Of particular interest, there is a need of education for patients taking NOACs.

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References