ORIGINAL ARTICLE

Knowledge of antithrombotic prophylaxis among patients with atrial fibrillation

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Abstract

Background: *Effective and safe anticoagulative therapy needs close co-operation between doctor and patient, the latter being well-informed. The aim of the study was to assess knowledge of oral anticoagulation in a group of patients with atrial fibrillation (AF) treated with acenocoumarol and to determine the relationship between knowledge and INR value.*

Method: *The study group consisted of patients with AF who were continuously using anticoagulative therapy and who were admitted to hospital (for different reasons). The questionnaire comprised questions about their knowledge of various aspects of the treatment used. In the assessment of knowledge a numerical scale was introduced (0–9 points) and the patients were given one point for each correct answer.*

Results: *The study group consisted of 61 patients aged 46–91 (mean 70.18). The level of knowledge of oral anticoagulation among the group of patients examined was low (the mean number of points achieved was 4.19 in the 9-point scale). Sex, education and the reason for admission had no relationship with the level of knowledge. Younger patients (4.85 ± 1.94 vs. 3.56 ± 1.86, p = 0.01) and those who had INR within the therapeutic limits at the moment of admission to the hospital (5.50 ± 1.79 vs. 3.56 ± 1.79 points, p = 0.0003) had a higher level of knowledge of the antithrombotic treatment.*

Conclusions: *Knowledge of treatment with acenocoumarol among the patients with atrial fibrillation using oral anticoagulation is low and inversely correlated with age. The greater the knowledge, the better is the value of INR controlled.* (Cardiol J 2007; 14: 44–49)

Key words: atrial fibrillation, acenocoumarol, patients' knowledge

Introduction

Antithrombotic prophylaxis is absolutely essential for a modern and rational therapy for patients with atrial fibrillation at particular risk of cerebral stroke. The introduction and proper monitoring of prolonged anticoagulation is probably more important for patients than taking a decision about the conversion of atrial fibrillation to a normal sinus rhythm [1]. Prolonged oral anticoagulation with proper control of the INR decreases the risk of a cerebral stroke by 2/3 times [2], which means a longer life and the prevention of permanent disability among patients with atrial fibrillation.

Despite the very encouraging results of clinical studies and their transposition to the official guidelines of cardiological societies [3–5], the frequency with which anticoagulative drugs are administered to those patients with atrial fibrillation with

additional risk factors of cerebral stroke is still alarmingly low [6, 7]. The essential factors responsible for this are physicians' fears of the complications associated with oral anticoagulation and the restrictive nature of the treatment, which is tiring for the patient. In addition, it appears that even among patients using antimetabolites of vitamin K on medical advice the number of checks on the INR value within the therapeutic limits varies by about 40% [8].

The specificity of prolonged oral antithrombotic prophylaxis requires continual co-operation between the doctor and a well-informed patient. It would appear that knowledge and a good understanding of oral anticoagulation by the patient is essential for the increased effectiveness and safety of the anticoagulative procedure. Explaining the aims of the therapy to the patient is a condition of their proper motivation towards their treatment; the effectiveness of the treatment requires knowledge of its rules and its safety depends on the patient's awareness of possible side effects and of their symptoms. In spite of this many studies indicate that there are serious gaps in the education of patients with atrial fibrillation taking oral anticoagulants [9–14].

The aim of the study was to assess the level of knowledge of oral anticoagulation and the correlation between this and INR in a group of patients with atrial fibrillation being treated with acenocoumarol.

Methods

The prospective study group consisted of 61 patients with a history of AF (paroxysmal, persistent or permanent) on prolonged oral antithrombotic prophylaxis who were admitted to hospital from the emergency department in 2005.

All the patients were asked to give their basic demographic data. Using anamnesis and medical history if available the character of the AF in the past was determined (paroxysmal, persistent or permanent) as well as concomitant illnesses which could influence the use of oral anticoagulation and the limits of therapeutic INR.

To evaluate their knowledge of antithrombotic prophylaxis all the patients examined were asked questions by a doctor and had a questionnaire to complete. The questions dealt with awareness of the antithrombotic therapy, knowledge of the name of the drug used and the aim of the treatment, knowledge of the influence of alcohol, diet and other drugs on the efficiency and safety of the therapy used and knowledge of the side effects of treatment

with acenocoumarol and the symptoms of these. To assess the level of knowledge a point-scale was used, one point being given for each correct answer. In addition, one question was included which required subjective evaluation of the degree of weariness experienced with the treatment used.

To assess the propriety of the control of the antithrombotic prophylaxis all the patients had their INR checked on admission. Values between 2.0 and 3.0 [3–5] were taken as the proper ones, apart from those of patients with an artificial valve, for whom the optimum limits depended on the recommendations for the particular valve [15].

The data received was statistically analysed by the use of the STATISTICA program. The continuous variables were given as the mean ± standard deviation. The significance of the differences observed between the results obtained was described by the use of Student's t-test and the χ^2 test of independence. Models of multifactorial regression analysis were also used. $P < 0.05$ was taken as the significance level.

Results

The study group consisted of 61 patients, 32 women and 29 men, aged 46–91 (mean age 70.2 ± ± 10.5), of whom 18 (30%) had a therapeutic value of INR on admission, 19 (31%) had a value which was too low and 24 (39%) a value which was too high. The characteristics of the group divided into two subgroups for those with and those without an INR therapeutic value, are shown in Table 1.

Of the group studied 57 people (93%) realised that they were being treated with a drug which reduced the ability of blood to coagulate ("blood thinning"). However, only 42 of them (69%) could give (more or less precisely) the name of a drug with such characteristics (Acenocumarol®, Sintrom®, Syncumar®).

The questions answered by the patients were of the multiple-choice type. In the question about the aim of the antithrombotic therapy, 19 answers (30%) were accepted as correct and 16 people gave the correct answer "cerebral stroke prophylaxis". Two of them associated antithrombotic prophylaxis with former implantation of an artificial valve and one associated treatment with acenocoumarol with emboli in the arteries of the lower extremities. A total of 18 patients thought that the aim of acenocoumarol was the prevention of a repeat of paroxysms of AF, 14 of them stated that the main aim of treatment was prevention of myocardial infarction and 24 members of the group could not provide any answer.

Table 1. Characteristics of group studied with division into therapeutic and non-therapeutic INR.

	Generally	Therapeutic INR	Non-therapeutic INR	p
N	61	18	43	
Male	29	9 (50%)	20 (46.5%)	NS
Mean age ± SD	70.2	68.11	71.05	NS
Patients with secondary or higher education	31	12 (66.7%)	19 (44.2%)	NS
Patients with permanent atrial fibrillation	51	14 (77.8%)	37 (86.1%)	NS
Patients after stroke	17	7 (38.9%)	10 (23.3%)	NS
Patients with heart failure	24	10 (55.6%)	14 (32.6%)	NS
Patients with pneumonia	12	3 (16.7%)	9 (20.9%)	NS
Patients with haemorrhagic complication	9	1 (5.6%)	8 (18.6%)	NS
Mean score	4.19	5.50	3.56	0.0003

The great majority, 51 patients (84%), were aware that the consumption of alcohol was not indicated during treatment with oral anticoagulants. When asked about drugs which increased the power of acenocoumarol 19 patients (31%) named acetylsalicylic acid (Aspirin®). Only a small number, 4 patients (7%), were aware of the influence on treatment of the consumption of a large amount of green vegetables. Only 8 patients (13%) knew that they would need to avoid, if possible, intra-muscular injections.

Although only 16 patients (26%) indicated haemorrhaging from the gastrointestinal system as a possible complication of the treatment used, 36 of them (59%) knew that the appearance of black faeces was a warning symptom requiring immediate contact with a doctor. The percentage of correct answers to questions dealing with different aspects of antithrombotic prophylaxis is shown in Figure 1.
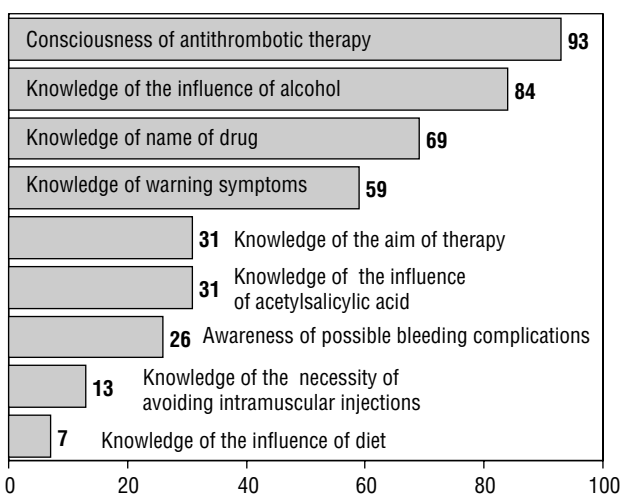

Figure 1. Knowledge of the particular aspects of antithrombotic treatment in the group studied. Figures indicate the percentage of correct answers.

The subjects examined were awarded scores between 0 and 8 points (mean 4.19) on a 9-point scale. The number of points achieved was dependent on neither sex nor education but on the age of those examined (mean age: 70 years, younger *vs.* older: 4.85 *vs.* 3.56 points, p = 0.01). With respect to knowledge among patients with permanent and paroxysmal/persistent AF, there was no demonstrable difference. The fact of cerebral stroke in their medical history did not change the level of knowledge. Similarly, there was no statistically important difference between patients when grouped according to the cause of admission (heart failure, pneumonia or haemorrhagic complication). There was a statistically significant difference between the number of points achieved by patients with a therapeutic INR and those with INR outside that value. The patients with an INR within the advisory limits were awarded 5.5 points on average, while those with an INR lower or higher than the therapeutic limits were awarded 3.56 points (p = 0.0003, Table 2). The above results were confirmed in a multifactorial analysis of regression, which showed a significant correlation between age and the therapeutic value of INR and the number of points achieved in the test (Table 3).

One question concerned the inconvenience asspciated with chronic anticoagulation. In response to this 21 subjects pointed out the necessity of systematic blood checks as the main problem, 9 the fear of complications caused by the treatment, 4 the cost of the medication and 1 the necessity of taking the medicine every day. At the same time 32 patients (52%) saw no inconvenience connected with the treatment administered.

Discussion

To sum up, we observed that among patients with AF who used chronic antithrombotic prophylaxis

Table 2. The score obtained in the test.

Male vs. female	4.07 ± 1.94 vs. 4.19 ± 2.05	NS
Age: ≤ 70 years vs. > 70 years	4.85 ± 1.94 vs. 3.56 ± 1.86	0.01
Education: primary and technical vs. secondary and higher	3.87 ± 1.93 vs. 4.39 ± 2.04	NS
Atrial fibrillation: permanent vs. paroxysmal/persistent	4.06 ± 1.91 vs. 4.50 ± 2.42	NS
After stroke vs. without stroke	4.59 ± 1.94 vs. 3.95 ± 2.00	NS
Heart failure vs. without heart failure	4.00 ± 1.68 vs. 4.22 ± 2.19	NS
Pneumonia vs. without pneumonia	4.08 ± 1.98 vs. 4.14 ± 2.01	NS
Haemorrhagic complication vs. without haemorrhagic complication	3.44 ± 2.36 vs. 4.25 ± 1.92	NS
INR therapeutic vs. INR non-therapeutic	5.50 ± 1.79 vs. 3.56 ± 1.79	0.0003

Table 3. Multifactorial analysis of regression — influence on the score obtained.

	Beta	p
Age	–0.407594	0.001111
Sex	–0.074903	NS
Type of atrial fibrillation	0.006347	NS
Stroke in anamnesis	0.066706	NS
Education	0.072489	NS
Therapeutic INR	0.0372786	0.001887
Heart failure	–0.114550	NS
Haemorrhagic complication	–0.058706	NS
Pneumonia	0.068917	NS

and were admitted to hospital the level of knowledge about their therapy was low (4.19 points on the 9-point scale) and inversely correlated with age. Patients with an INR value on admission within the therapeutic limits had a higher score in our questionnaire.

Guidelines currently being published for the management of patients with AF underline the role of the education of the patient in the treatment of chronic diseases of the circulatory system [16–18]. Simultaneously, there are reports which emphasise the level of knowledge of the individuals treated, which remains low [19, 20]. Prolonged oral antithrombotic prophylaxis can serve as a model of medical management which needs the conscious co-operation of the patient when taking decisions about the beginning of therapy, its prolongation, its control and also the prevention and early discovery of side effects. This necessary co-operation is possible only in the case of patients who have some awareness of the aims, rules, advantages and dangers of the treatment being used.

Bearing this in mind, many authors in different countries have studied the level of education among patients using antimetabolites of vitamin K [9–14]. Although these researchers have constructed their questionnaires in different ways, most have included questions dealing with the patient's understanding of the aim of the therapy, its possible side effects and interactions with other drugs. The general conclusion of all these studies has been that the level of knowledge of those questioned is alarmingly low. Some authors have attempted a quantitative evaluation of the mean level of education of the individuals examined [11, 12, 14]. Although different questionnaires and different ways of evaluating the results have been used, their results were very similar to those presented in this study (0.48 of the 1.00 possible in the study of Tang et al. [11], 7.14 on a 15-point scale in de Felipe Medina's study [12] and 6.63 out of 12 possible points in Salgari's et al. study [14]).

It is generally considered that introducing antithrombotic therapy among older people is especially difficult, not only in view of the increased risk of bleeding but also of the more problematic co-operation both in the treatment and in its monitoring [21]. Tang et al. [11] underline in their study that the level of knowledge about oral anticoagulation among older people is lower. Similarly, we have demonstrated in our study a statistically significant difference in the level of knowledge between younger and older people. We did not, however, demonstrate a correlation between age *per se* and a proper control of INR.

There is one especially interesting question: to what extent is the knowledge of those treated correlated with proper control of INR and with the effectiveness and safety of the therapy that this implies? In de Felipe Medina's study [12], which was specifically designed to answer this question, no significant correlation was demonstrated between the level of knowledge of people filling in the questionnaire and the number of checks of INR within the therapeutic limits. On the other hand,

in the study by Tang et al. [11] study a positive correlation was indeed shown between level of knowledge and the correctness of control of INR during visits before the study. The most interesting results are those of Saligari et al. [14]. These demonstrated that the greater the knowledge of patients (associated with the introduction of an educational programme), the more the INR checks fell within the therapeutic limits. All the above studies were based on the populations of antithrombotic clinics and medical documents, including a series of INR results, could be checked. In our study of necessity we based our research on a single check on the day of admission to hospital. Although we showed a correlation between the level of knowledge and the INR value, we were conscious that the value of a single check is obviously very limited as far as an evaluation of the quality of control of anticoagulation goes. On the other hand, it is worth observing that even episodic INR beyond the therapeutic value can be a reason for the ineffectiveness of treatment, its complications or the necessity for hospitalisation.

The problem of correlation between level of knowledge and quality of control of oral anticoagulation was studied by Arnsten et al. [22] in a slightly different way. They compared a group of patients being monitored in a health centre supervising anticoagulative therapy and a group of patients who had unilaterally stopped taking the medicine or had been excluded from the centre because of lack of co-operation. The researchers showed that patients who broke the contact with the centre were younger, had less understanding of the aims of the therapy and complained about worse contact with their doctor. The last finding provides us with a chance to discover why there is such a low level of knowledge in patients and to have the opportunity to improve it.

The education of a patient using oral anticoagulants is difficult and time-consuming. It should begin from the very moment the decision is taken together by the doctor and patient to introduce the drug and should continue throughout the whole period of treatment. The conscious and active participation of the patient in the process of treatment needs information from the doctor about their subjective role plus explanations of the aim of the therapy used, its expected benefits and possible disadvantages. Alternative methods should also be presented and, finally, the doctor must record that a patient has understood all the above information. Braddock et al. [23] analysed over 1000 records of visits with regard to the components in the relationship between doctor and patient. In the case of a decision being taken to introduce a new drug, none of the dialogues contained all the components stated. The advantages of educational programmes were presented in a study already cited by Saligari et al. [14]. Considering the time constraints between doctor and patient, as well as the complexity of antithrombotic therapy in patient education, the use of special instructional materials is advised [24].

It is thought that well-educated patients are characterised by their greater acceptance of antithrombotic therapy [24, 25]. Paradoxically, in our study, despite their poor level of knowledge, more than half of those questioned did not inform the researchers of any problems with their treatment. What is significant is that only nine people verbalised a fear of possible complications of the therapy.

The limitation of the study was the fact that it was based on patients admitted to hospital and not patients at an antithrombotic clinic. Taking into consideration that some of them were admitted to hospital because of incorrect control of anticoagulation, one may predict that the knowledge in the group studied was inferior to that among people treated in this way when taken as a whole. Nevertheless, it is the over-represented group in our study which needs special care and education. The group studied was relatively small, which constitutes the other limitation, but this is mainly a result of the continuing low frequency of administration of anticoagulative drugs in the group of patients with AF. Nevertheless, considering the importance of the matter and, as we saw it, the interest of our findings, we decided to terminate the study after one year and to present the results.

Conclusions

1. The level of knowledge about treatment with acenocoumarol among patients with atrial fibrillation who are admitted to hospital and are using oral anticoagulative therapy is low. Patients over 70 years of age have a lower level of knowledge than younger ones.
2. The low level of knowledge about oral anticoagulation is a risk factor in the improper control of the INR value.

References

1. The AFFIRM Investigators: A comparison of rate control and rhythm control in patients with atrial fibrillation. N Engl J Med, 2002; 347: 1825–1833.
2. Hart RG, Benavente O, McBride R, Pearce LA. Antithrombotic therapy to prevent stroke in patients with

atrial fibrillation: a meta-analysis. Ann Intern Med, 1999; 131: 492–501.

3. ACC/AHA/ESC guidelines for the management of patients with atrial fibrillation. Eur Heart J, 2001; 22: 1852–1923.

4. Albers GW, Dalen JE, Laupacis A, Manning WJ, Petersen P, Singer DE. Antithrombotic therapy in atrial fibrillation (Sixth ACCP consensus conference on antithrombotic therapy). Chest, 2001; 119: 194S––206S.

5. Trusz-Gluza M, Dąbrowski A, Kornacewicz-Jach Z et al. Nadkomorowe zaburzenia rytmu serca. Polskie Towarzystwo Kardiologiczne Standardy postępowania w chorobach układu krążenia. Kardiol Pol, 1997; 66 (suppl I): 51–63.

6. Bungard TJ, Ghali WA, Teo KK, McAlister FA, Tsuyuki RT. Why do patients with atrial fibrillation not receive warfarin? Arch Intern Med, 2000; 160: 41–45.

7. Rewiuk K, Bednarz S, Faryan P, Kąkol J, Grodzicki T. Rozpowszechnienie i jakość profilaktyki przeciwzakrzepowej u chorych z migotaniem przedsionków. Folia Cardiol, 2003; 10: 633–640.

8. Gurwitz JH, Monette J, Rochon PA, Eckler MA, Avorn J. Atrial fibrillation and stroke prevention with warfarin in the long-term care setting. Arch Intern Med, 1997; 157: 978–984.

9. Taylor FC, Ramsay ME, Tan G, Gabbay J, Cohen H. Evaluation of patients' knowledge about anticoagulant treatment. Qual Health Care, 1994; 3: 79–85.

10. Lip GYH, Kamath S, Jafri M, Mohammed A, Bareford D. Ethnic differences in patient perception of atrial fibrillation and anticoagulation therapy: the West Birmingham Atrial Fibrillation Project. Stroke, 2002; 33: 238–244.

11. Tang EO, Lai CS, Lee KK, Wong RS, Cheng G, Chan TY. Relationship between patients' warfarin knowledge and anticoagulation control. Ann Pharmacother, 2003; 37: 34–39.

12. de Felipe Medina R. Level of understanding of patients on anticoagulants at a health centre: relationship of this and monitoring of therapy. Aten Primaria, 2003; 32: 101–105.

13. Roche-Nagle G, Chambers F, Nanra J, Bouchier--Hayes D, Young S. Evaluation of patient knowledge regarding oral anticoagulants. Ir Med J, 2003; 96: 211–213.

14. Saligari E, Belle L, Berry C et al. Evaluation of an education program of patients undergoing anticoagulation treatment. Ann Cardiol Angeiol. 2003; 52: 297–301.

15. Goldsmith I, Turpie AGG, Lip GYH. ABC of antithrombotic therapy: Valvar heart disease and prosthetic heart valves. BMJ, 2002; 325: 1228–1231.

16. Task Force for the Diagnosis and Treatment of Chronic Heart Failure European Society of Cardiology: Zalecenia Europejskiego Towarzystwa Kardiologicznego. Rozpoznawanie i leczenie przewlekłej niewydolności serca. Folia Cardiol, 2002; 9 (suppl. A): A1–A72.

17. JNC VII Express — VII Report Joint National Committee w sprawie zapobiegania, wykrywania, oceny i leczenia nadciśnienia tętniczego. Folia Cardiol, 2003; 10 (suppl. A): A1–A20.

18. Fihn SD, Williams SV, Daley J, Gibbons RS. Guidelines for the management of patients with stable angina: treatment. Ann Inter Med, 2001; 135: 616–632.

19. Wizner B, Grodzicki T, Gryglewska B, Kocemba J. Wiedza o nadciśnieniu tętniczym i zachowania prozdrowotne mieszkańców Krakowa. Nadciśnienie Tętnicze 1998; 2: 199–206.

20. Ni H, Nauman D, Burgess D, Wise K, Crispell K, Hershberger RE. Factors influencing knowledge of and adherence to self-care among patients with heart failure. Arch Intern Med, 1999; 159: 1613–1619.

21. Fihn SD, Callahan CM, Martin DC, McDonell MB, Henikoff JG, White RH. The risk for and severity of bleeding complications in elderly patients treated with warfarin. Ann Intern Med, 1996; 124: 970–979.

22. Arnsten J, Gelfan JM, Singer DE. Determinants of compliance with anticoagulation: a case-control study. Am J Med, 1997; 103: 11–17.

23. Braddock CH, Edwards KA, Hasenberg NM, Laidley TL, Levinson W. Informed decision making in outpatient practise. Time to get back to basis. JAMA, 1999; 282: 2313–2320.

24. Man-Son-Hing M, Laupacis A, O'Connor AM et al. A patient decision aid regarding antithrombotic therapy for stroke prevention in atrial fibrillation. JAMA, 1999; 282: 737–743.

25. Man-Son-Hing M, Laupacis A, O'Connor A et al. Warfarin for atrial fibrillation: the patient's perspective. Arch Intern Med, 1996; 156: 1841–1848.