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**To cite this article:** Kari Eskola, Pirjo Aittoniemi, Harri Kurunmaki, Anneli Latva-Nevala, Matti Paloneva, Anne-May Wallid, Mirjami Viitaniemi, Irma Virjo, Suvi Ylinen, Seppo Ohman & Mauri Isokoski (1996) Anticoagulant treatment in primary health care in Finland, *Scandinavian Journal of Primary Health Care*, 14:3, 165-170, DOI: [10.3109/02813439609024172](https://doi.org/10.3109/02813439609024172)

**To link to this article:** <https://doi.org/10.3109/02813439609024172>



Published online: 12 Jul 2009.



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# Anticoagulant treatment in primary health care in Finland

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**Eskola K, Aittoniemi P, Kurunmäki H, Latva-Nevala A, Paloneva M, Wallin A-M, Viitaniemi M, Virjo I, Ylinen S, Öhman S, Isokoski M. Anticoagulant treatment in primary health care in Finland. Scand J Prim Health Care 1996;14:165–70.**

**Objective** – To establish the prevalence of anticoagulant (AC) treatment, the indications, and the quality of care in primary health care.

**Design** – A cross-sectional study, in which patients on AC treatment were identified from laboratory records. The main and second indications for AC treatment and the last value of the AC-test were taken from medical records.

**Setting** – Eight Finnish health centres with a total population of 182 091 inhabitants.

**Results** – A total of 1255 patients on AC treatment were identified, 48% of them men. The mean age was 68.9 years. The age-adjusted prevalence of AC treatment was 0.65%. The commonest main indication was atrial fibrillation (38%). It was the main or second indication in 591 patients (age-adjusted prevalence 0.30%). The next commonest main indication was deep vein thrombosis (15%), followed by pulmonary embolism (8%). A total of 274 (22%) patients were anticoagulated for cerebral circulatory disturbances. 86% of the latest prothrombin time values fell within recommended ranges.

**Conclusion** – The prevalence of AC treatment in Finland seems to be high. The proportion of patients with atrial fibrillation is high, differing from the results in other countries. The monitoring of AC-treatment as the general practitioner's responsibility functions well. The quality of care is good, even in older age groups.

**Key words:** anticoagulant treatment, atrial fibrillation, Finland, prevalence, warfarin, primary health care, quality assurance.

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Anticoagulant (AC) treatment has an established value in the prevention of thromboembolic complications (1-3). In a Danish study (1) 2.0% of atrial fibrillation patients on warfarin therapy and 5.5% of those on aspirin or placebo had thromboembolic complications per year. On the other hand, bleeding complications are inherent risks of AC treatment. They are likely even on sub-thera-

peutic ranges (4,5). The annual risk of haemorrhagic complications, including fatal cases, is 2-3%. Hypertension and advancing age increase the risk (1,2).

New trials on the effectiveness of AC treatment have brought calls for increased use of anticoagulants, particularly in patients with atrial fibrillation (6-8). On the other hand, it has been

suggested that the results of these trials with highly selected patients and very keen follow-up may lack generalizability (6-8).

Studies on the prevalence of AC treatment are rare. In the study by Fogelholm et al. (4) the prevalence of AC treatment in Finland was 1.6 % in people aged 40 or over. In two Swedish studies (5,9) the prevalence in the whole population was 0.36%.

The commonest indication for AC treatment in Sweden was stroke. In a Scottish study (10) half of the AC patients had valvular disease or prosthetic valve; atrial fibrillation was the main indication of 12% of the patients.

Pell and Alcock (11) have shown that AC control may be managed better by general practitioners (GPs) than by hospital AC clinics. Sixty-five percent of Scottish GPs preferred hospital review in problematic cases only (11).

In their review article Sweeney et al. (8) recommend that the decision to initiate warfarin therapy should be the result of true collaboration between the patient, the GP, and the specialist. In Finland patients with serious and acute diseases needing AC treatment are treated in hospitals, and the decision to start that treatment is made there. Some AC treatment (for instance for chronic atrial fibrillation of elderly patients) is started in health centres. The monitoring of treatment is carried out in health centres by GPs, and the usual interval between laboratory appointments is from three to six weeks, very seldom more than eight weeks.

The aim of this study was to establish the prevalence of AC treatment and the indications and the quality of care in primary health care.

## Patients and methods

The University of Tampere announced a research course for GPs by sending an invitation letter to the chief doctors of all the 31 health centres in Vaasa province. The participants came from eight very typical Finnish health centres. The study was carried out in these eight health centres, which served populations of 7500 to 54 000 inhabitants, to a total of 182 091. All the patients who visited laboratories for the prothrombin time value from 1 September to 1 December 1992 were identified from laboratory records.

In the beginning of December 1992, study group members phoned to the hospitals and private institutions of the area to find out whether there were other patients on AC treatment.

The doctors in the study group examined the medical records of these patients on 1 December 1992 to make sure that they really were on AC treatment. The age, sex, and place of residence of the patients were recorded. The diagnosis (ICD-9, Finnish Edition) regarded by the doctor as the most important reason for treatment was entered as the main indication for AC treatment. If there were other reasons, the most important of them was registered as the second indication.

In order to monitor the effect of AC treatment, Simplastin-A® was used at seven health centres, and Thrombotest® at one. The last Simplastin-A® or Thrombotest® value prior to 1 December 1992 was recorded. Use of warfarin for more than or less than one month was also recorded. The dosage of AC is usually balanced within two to three weeks, and in the study of the quality of care, patients treated for less than one month were therefore excluded.

The recommended range of AC treatment was 10-25 % (international normalized ratio INR between 4.2 and 2) when monitoring AC treatment with Simplastin-A®, and 5-15% (INR between 4.5 and 2.1) when using the Thrombotest® method. In Finland there are no official recommendations for different intensities of anticoagulation for different indications. Therefore these values were used as recommended ranges of prothrombin times. The reporting of the prothrombin time is not yet standardized with the use of INR.

The health centres in the study were in the catchment area of three central and one district hospitals.

Frequencies and cross-tabulations were used in statistical analyses together with direct age adjustment, using the Finnish population at 1 January 1992.

## Results

### Prevalence

A total of 1255 patients on AC treatment were recorded (Table I). This was 0.69% of the population studied. The age-adjusted prevalence was

**Table I.** Number and mean age of anticoagulated patients, and the age-adjusted prevalence of anticoagulant treatment, by sex.

	Number of patients	Average age (years)	Age-adjusted prevalence
Male	602	66.2	0.64%
Female	653	71.4	0.66%
Total	1255	68.9	0.65%

0.65%, varying in the health centres from 0.54–0.80%, and in the catchment areas of the four hospitals from 0.57–0.80%. The youngest patient was 7 years old, the oldest 94.

The prevalence of AC treatment was low until 40 years of age, after which it started to rise. For the men it peaked at 4.38% in the 75–79 year-olds, for the women at 4.27% in the 80–84 year-olds (Fig. 1).

#### Indications

There were 95 different diagnoses as the main indication and 54 as the second indication for AC treatment. The commonest main indication was atrial fibrillation, followed by deep vein thrombosis (Table II).

A second indication was found for 330 (26%) patients, the commonest being atrial fibrillation (Table II). In all, 591 (47%) patients had atrial

fibrillation. Cerebral circulation disturbance was the main indication for 274 (22%) patients. The main indication for 25 patients (2.0%) was acute myocardial infarction (ICD-9 410), and for 26 patients (2.1%) some other ischaemic myocardial disease (ICD-9 411–414).

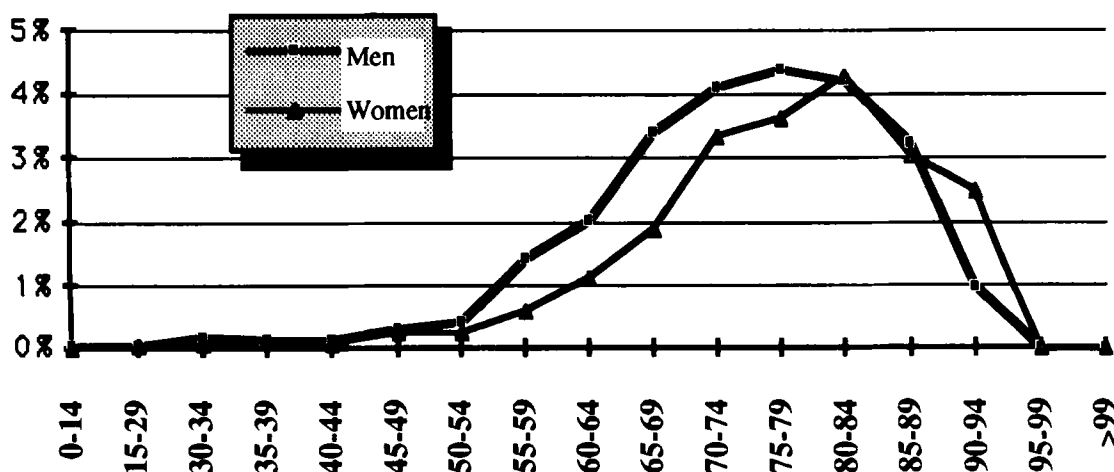
Patients with a prosthetic valve or valvotomy were included in two diagnosis groups “Sequelae morbi rheumatici cordis” (ICD-9 393 – 398) and “Morbi endocardii alii” (ICD-9 424) within the main indication group “other diseases” (23%). Of all the patients, 108 (8.4%) belonged to one of these two subgroups.

With respect to age and main indication, the patients who had transient ischaemic attack were the oldest (73.4 years), while the youngest had deep vein thrombosis (65.8 years) or pulmonary embolism (68.1 years).

#### The quality of care

At the seven health centres where AC treatment was monitored with Simplastin-A®, 83% of the latest prothrombin time values were within recommended ranges (Fig. 2). The variation between health centres was 82–88%. At the centre which used the Thrombotest®, 92% (127/138) patients were at the recommended level, while the others were above the recommended range. Only 1.4% of all patients treated for longer than one month were too strongly anticoagulated.

Values fell within the recommended range in



**Fig. 1.** The prevalence (%) of anticoagulant treatment by sex and age group.

Table II. The six commonest main and second indications for AC treatment.

	Main indication		Second indication	
	n	%	n	%
1. Atrial fibrillation	472	38	119	9
2. Deep vein thrombosis	192	15	20	2
3. Pulmonary embolism	102	8	16	1
4. Cerebral thrombosis	104	8	15	1
5. Cerebral embolism	52	4	16	1
6. Transient ischaemic attack	50	4	12	1
Other diseases	283	23	132	11
No second indication			925	74
All	1255	100	1255	100

the older age groups to the same extent as in the younger ones (Table III). The recommended values were most commonly exceeded in women under 40 years of age.

## Discussion

Enquiries at hospitals and private institutions confirmed the hypothesis that the monitoring of AC treatment very seldom takes place elsewhere than at health centres. Under the three-month follow-up scheme all patients had, or should have visited the health centre laboratory for an AC test. Gathering patients by this method eliminates

those who are in hospital for longer periods, and those who do not come for check-ups. The prevalences found are minimal, and the bias cannot be great.

Our study was broad enough to give a good idea of general practice in AC treatment in Finland. We have not found any material of this extent regarding the prevalence of AC treatment to be able to compare our results internationally. Within the Finnish system, where AC treatment is monitored at health centres, it may be easier to discover its prevalence than in countries where monitoring takes place partly at hospitals, partly in primary health care.

The prevalence of AC treatment found in our

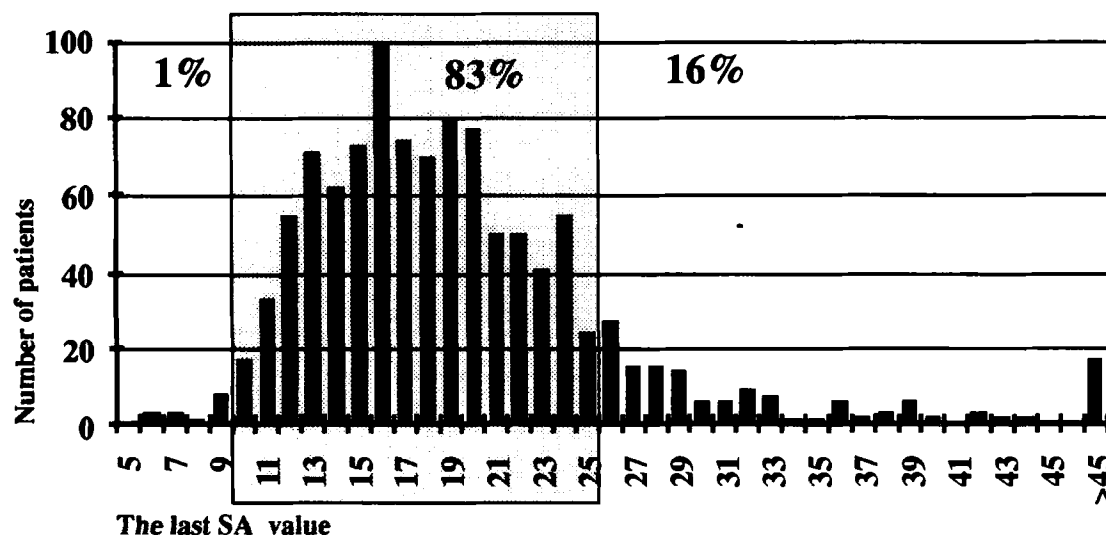


Fig. 2. Distribution of the last SA-values, patients treated for more than one month (n=1089). The recommended range shadowed.

Table III. Falling of the last prothrombin time (SA or TT) within the recommended range, all patients treated for more than one month, 95% confidence intervals in brackets.

Age (years)	Number of patients	<i>Men</i>		
		Below the range (%)	Within the range (%)	Above the range (%)
0-39	24	0 (0-14)	83 (63-95)	17 (5-37)
40-59	108	0 (0-3)	87 (81-93)	13 (7-19)
60-79	395	1 (0-2)	90 (87-93)	9 (7-13)
80-	62	0 (0-6)	89 (78-95)	11 (5-22)
All	589	1 (0-1)	89 (86-92)	10 (8-13)

Age (years)	Number of patients	<i>Women</i>		
		Below the range (%)	Within the range (%)	Above the range (%)
0-39	15	0 (0-22)	53 (27-79)	47 (21-73)
40-59	54	0 (0-7)	87 (75-95)	13 (5-25)
60-79	414	2 (1-3)	84 (81-88)	14 (11-17)
80-	156	3 (1-7)	84 (79-90)	13 (8-18)
All	639	2 (1-4)	84 (81-87)	14 (12-17)

study (0.65%) is almost double that in Sweden (5.9). In the Nordic countries the prevalences of AC treatment have been calculated on the basis of warfarin consumption (12). According to this not very reliable evaluation, the prevalences would be 0.20% in Denmark, 0.47% in Finland, 0.40% in Sweden, 0.50% in Iceland, and 0.47% in Norway. On the same basis, Jørgensen in Copenhagen (12) has calculated that 0.10% of the population in the UK, 0.18% in the USA, and 0.68% in The Netherlands are on AC treatment. These figures give an indication of varying practices in different countries.

Prevalences also varied in the eight health centres in the present study. It is known that there are differences in vascular morbidity in the eastern and western parts of Finland (13). In these health centres the population is, however, highly homogeneous, and the different figures are probably due to different local practices in AC treatment.

The authors sought the main and second indications from medical records. Many patients had a long history of various circulatory diseases, e.g. atrial fibrillation followed by stroke, or myocardial ischaemia followed by heart operation. It was not easy to find the most important diagnosis indicating AC treatment. However, two diagnoses rather than one give more real reasons for treat-

ments. We believe that indications determined by doctors rather than by other personnel are more reliable.

Our finding that the commonest main indication for AC treatment was atrial fibrillation (38% of patients), and that overall 47% of the patients had atrial fibrillation as a main or second indication, compared with Wändell's study (9), in which atrial fibrillation was given as the indication for treatment in 20% of patients, stroke in 29%, deep vein thrombosis in 15%, and pulmonary embolism in 12%. Of Cervin and Billström's patients (5), one third were anticoagulated for venous thromboembolism, one third for cardiac diseases, and one third for cerebrovascular disturbances. In the study by Pell et al. (10) concerning anticoagulant control in UK, the commonest indication for AC treatment was prosthetic valve (27%), followed by mitral valve disease or valvotomy (23%), and atrial fibrillation (12%) was in third place.

The distribution of indications for AC treatment seems therefore to vary. The proportion of atrial fibrillation patients among Finnish patients on AC treatment seems to be high. Conversely, the proportion of patients with prosthetic valve or valvotomy is lower in Finland than in several other countries.

In Finnish health centres in 1987, 67% of all

prothrombin time values and 54% of two consecutive values were within the recommended range (14). In the study by Pell et al. (10), 52% of patients treated by GPs and 45% treated by a hospital anticoagulant clinic were within the recommended range. Among our patients 86% of values were within the recommended range; only 1.4% fell below it. An exception was in the younger women's group (0-39 years) (Table III). It is possible that the AC treatment makes younger women's menstrual bleeding so uncomfortable that they are not willing to take strong anticoagulation. In therapy it might be wise to set different target values for this group of AC patients.

AC treatment can prevent serious illness and even death. However, treatment is not without risk and therapeutic ranges are narrow. Patients are elderly and suffer from many diseases, and the monitoring of care and adjustment of dosage generates a considerable workload in health care. In Finland there seems to be a very high prevalence of AC treatment. The quality of care in the hands of GPs is good, even in the older age groups.

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Received October 1995

Accepted January 1996