

Epidemiological Structure, Socioeconomic Effects and Burden of Disease in Patients with Oral Anticoagulation and Atrial Fibrillation in Austria

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Objectives

Atrial fibrillation (AF) is the most common arrhythmia in clinical practice and associated with a high risk of stroke. In Austria, about 130,000 people are affected by AF. The aim of this analysis was to develop an Austrian patient flow and treatment path to close the research gap and estimate the total cost of illness (direct and indirect costs) of AF patients with recommended oral anticoagulation.

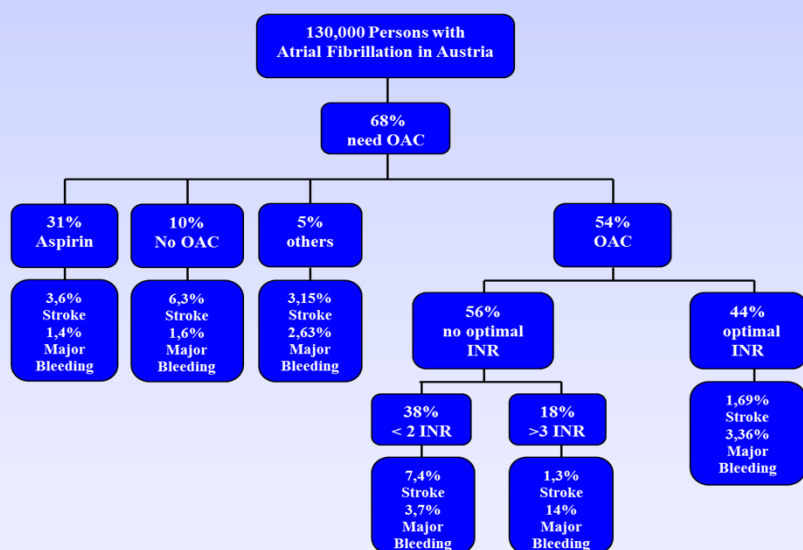
In patients with a CHADS2 score ≥ 2 , chronic oral anticoagulation (OAC) therapy with a Vitamin K-Antagonist is recommended in a dose-adjusted approach to achieve an optimal international normalized ratio (INR 2-3). In Austria oral anticoagulation therapy such as Phenprocoumon (e.g. Marcoumar®) and Acenocoumarol (Sintrom®) are recommended for patients with atrial fibrillation with a high risk of stroke in order to reduce risk of vascular events.

However, long-term monitoring is necessary and many patients can't achieve optimal anticoagulation. Anticoagulation is not without risk and therapeutic ranges are narrow. Underanticoagulation may result in thrombotic events and overanticoagulation carries an increased risk of haemorrhage.

Methods

To estimate the economic burden due to atrial fibrillation with a high risk of stroke a cost of illness study was conducted based on the patient flow. The model is based on these 130,000 detected AF patients. The approach used is prevalence-based, with a time horizon of one year. According to the published literature, for 68% (n=88,400) of these patients oral anticoagulation is recommended, but only 54% (n=47,736) of patients in the high-risk group received an OAC therapy. The remaining patients get Aspirin (31%), other medication (5%) or no therapy (10%). To calculate the total costs of patients with AF and follow up costs of elevated risk of stroke, direct and indirect costs were considered. Clinical-data and costs of adverse events like stroke and major bleeding as well as mortality rates were considered. The cost of illness study is conducted from a societal perspective.

Fig. 1: Epidemiological Model Design



Source: IPF own depiction

Resource Use and Cost

The total costs per patient are a function of both the quantity of given resource used and its unit cost. The resource use was determined by literature (e.g. disease specific guidelines) as well as by experts. Direct costs comprise all direct medical costs like consultation, lab test, inpatient costs, medication and treatment costs from catalogue and official price lists for the Austrian health insurances. The costs for the OAC monitoring are weighted per treatment setting. It is assumed that 20% of these patients are managed in the hospital outpatient department, 30% visit for the INR test an external lab and 50% are managed by general practitioners and all patients visit a specialist biyearly. Inpatient treatment costs are derived from the LKF (Austrian DRG). Indirect costs represent published data and comprise the cost of nursing homes for patients with stroke as well as allowance for nursing care.

Disability data from the Austrian Stroke Registry concerning patients with AF and stroke were included in the cost of illness study to calculate nursing care costs.

All costs represent data from 2011.

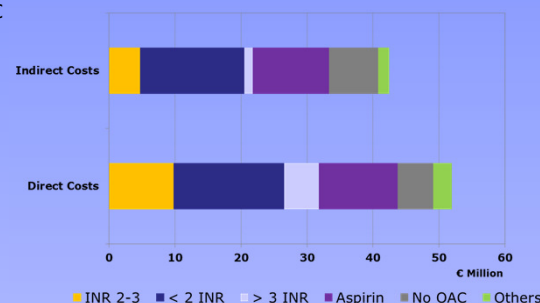
Results

The direct and indirect costs per patient group are illustrated in Figure 2. The total direct costs for all patients are €51,972,668 and the total costs including indirect amount to €93,915,300 within the time horizon of one year.

A patient in optimal INR causes the lowest cost with €679, the highest costs per patient are caused by patients < 2 INR (€1,867) followed by no OAC (€1,496), others (€1,058), Aspirin (€882) and > 3 INR (€800).

Fig.2: Total Costs per Patient and Patient Group in €

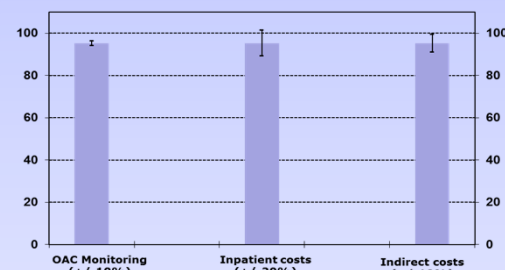
	Number of Patients	Direct costs/ Patient	Indirect costs/ Patient	Total costs/ Patient
INR 2-3	20,570	€ 476	€ 203	€ 679
< 2 INR	17,414	€ 961	€ 906	€ 1,867
> 3 INR	8,249	€ 641	€ 159	€ 800
Aspirin	26,678	€ 448	€ 434	€ 882
No OAC	8,553	€ 629	€ 867	€ 1,496
Others	4,279	€ 664	€ 394	€ 1,058
AF direct costs for all patients			€ 51,972,668	
AF indirect costs for all patients			€ 41,942,632	
AF total costs			€ 93,915,300	



Source: IPF own calculations

The results were tested using a deterministic sensitivity analysis. Variations of inpatient costs, indirect costs and costs of the oral anticoagulation monitoring have no influence on the results.

Fig. 3: Sensitivity Analysis



Source: IPF own calculations

Conclusion

Atrial Fibrillation is an important public health problem in European countries. AF is associated with increased morbidity and mortality. With rising life expectancy the number of patients with AF and the prevalence of strokes will increase. Therefore the time has come to give greater attention to the epidemiological and socioeconomic burden of AF.

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