PREDICTORS OF RECURRENCE OF ATRIAL FIBRILLATION AFTER ELECTRICAL CARDIOVERSION

Thesis

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BY

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List of Abbreviation

Abbrev	*Meaning*
2D	Two dimension
ACC	American College of cardiology
ACEIS	Angiotensin-converting enzyme inhibitors
ACS	Acute coronary syndrome
ACTIVEW	Atrial fibrillation Clopidogrel Trial with Irbesartan for prevention of Vascular Events– Warfarin arm trial
AF	Atrial fibrillation
AFFIRM	Atrial Fibrillation Follow-up Investigation of Rhythm Management
AHA	American Heart Association
AFASAK	Copenhagen Atrial Fibrillation Aspirin Anticoagulation
ARB	Angiotensin Receptor Blocker
ATRIA	Anticoagulation and Risk Factors In Atrial Fibrillation
AV	Atrioventricular
AVN	Atrioventricular Node
AVRO	Active-controlled, multi-center, superiority study of Vernakalant injection versus amiodarone in subjects with Recent Onset atrial fibrillation
BAFTA	The Birmingham Atrial Fibrillation Treatment of the Aged study
BMI	Body mass index
CAD	Coronary artery disease
CCB	Calcium channel blocker

CHF	Congestive heart failure
CI	Confident interval
COPD	Chronic obstructive pulmonary disease
CPR	Cardiopulmonary resuscitation
CT	Computered tomography
CVS	Cerebrovascular stroke
DCC	Direct current cardioversion
DM	Diabetes mellitus
EAFT	European Atrial Fibrillation Trial
EAPCI	European Association of Percutaneous Cardiovascular Interventions
ECG	Electrocardiogram
ED	Emergency department
ESC	European Society of Cardiology
ESPS	European stroke prevention study
FRACTAL	Fibrillation Registry Assessing Costs, Therapies, Adverse events, and Lifestyle
GRACE	Global Registry of Acute Coronary Events
HAS-BLED	Hypertension, Abnormal renal/liver function, Stroke, Bleeding history or predisposition, Labile INR, Elderly, Drugs/alcohol concomitantly
HOT CAFE´	HOw to Treat Chronic Atrial Fibrillation
HTN	Hypertension
IHD	Ischemic heart disease
INR	Optimal international normalized ratio
IV	Intravenous

J-RHYTHM	Japanese Rhythm Management Trial for Atrial Fibrillation
LA	Left Atrium
LAA	Left Atrial Appendage
LASAF	Low Dose Aspirin Stroke Atrial Fibrillation
LMWH	Low molecular weight heparin
LVEDP	Left ventricular end-diastolic pressure
LVEF	Left ventricular ejection fraction
MHZ	Mega hertz
MRI	Magnetic resonance imaging
NSTEMI	Non ST segment elevation myocardial infarction
NYHA	New York Heart Association
OAC	Oral anticoagulant therapy
PAC	Premature atrial complex
PAD	Peripheral arterial disease
PATAF	Prevention of arterial thromboembolism in atrial fibrillation
PCI	Percutaneous coronary intervention
PIAF	Pharmacological Intervention in Atrial Fibrillation
PPIS	Proton pump inhibitors
PUFAS	Polyunsaturated fatty acids
PVS	Pulmonary veins
RACE	RAte Control versus Electrical cardioversion for persistent atrial fibrillation
RBB	Right bundle branch

RE-LY	Randomized Evaluation of Long-term anticoagulant therapY
RF	Radiofrequency
RR	Relative Risk
SPAF	Stroke prevention in atrial fibrillation
SPINAF	Stroke prevention in Nonrheumatic atrial fibrillation
STAF	Strategies of Treatment of AF
SVT	Supraventricular tachycardia
TE	Thromboembolism
TIA	Transient ischemic attack
TIMI	Thrombolysis in myocardial infarction
TOE	Transesophageal echo
UH	Unfractionated heparin
UFH	Unfractionated heparin
UK	United kingdom
UK-TIA	United Kingdom-Transient Ischemic Attack Aspirin Trial
US	United States
VKA	Vitamin K antagonists
VT	Ventricular Tachycardia
WASPO	Warfarin versus Aspirin for Stroke Prevention in Octogenarians with AF trial
WPW	Wolff-Parkinson-White Syndrome

Introduction

AF is the most common arrhythmia requiring treatment. The overall prevalence in the general population is estimated to be 0.4 percent. This is likely an underestimate because many people with AF are asymptomatic. ***(Ostranderld JR, et al, 1965).***

The incidence and prevalence of AF steadily increase with age, such that this arrhythmia occurs in <0.5 percent of the population <50 years of age and increases to approximately 2 percent at ages 60 to 69 years, 4.6 percent for ages 70 to 79 years, and 8.8 percent for ages 80 to 89 years. The age-adjusted prevalence of AF is higher for men than women and higher for whites than blacks. ***(Wolf PA, et al, 1991).***

Most cases of AF occur in patients with evidence of structural heart disease, but there may be no evidence of concomitant disease in >50 percent of patients with paroxysmal AF. In contrast, >80 percent of patients with permanent AF have an identifiable underlying cause. (***Klein EA. 2000).***

Classification

AF traditionally has been described as either paroxysmal or chronic. However, the definition of *chronic* varies greatly in the literature, often suggesting permanent AF. The American Heart Association (AHA), American College of Cardiology (ACC), and the European Society of Cardiology(ESC) have proposed a standardized classification scheme to describe AF. (***Fuster V, et al, 2006***).

At the initial detection of AF, it may be difficult to be certain of the subsequent pattern of duration and frequency of recurrences. *First detected* episode of AF is made on the initial diagnosis.

When the patient has experienced two or more episodes, AF is classified as *recurrent.*

After the termination of an episode of AF, the rhythm can be classified as *paroxysmal* or *persistent.*

Paroxysmal AF is characterized by self-terminating episodes that generally last <7 days (most <24 hours).

Persistent AF generally lasts >7 days and often requires electrical or pharmacologic cardioversion.

AF is classified as *permanent* when it has failed cardioversion or when further attempts to terminate the arrhythmia are deemed futile.

It might be more appropriate to use the term *established* rather than permanent, because these patients can undergo successful ablation to restore and maintain sinus rhythm precluding the concept of *permanent.*

Although this classification scheme is generally useful, the pattern of AF may change in response to treatment. Thus, AF that has been persistent may become paroxysmal during pharmacologic therapy with antiarrhythmic medications.

Persistent atrial fibrillation (AF) may be terminated by transthoracic electrical cardioversion but recurrence of AF is common. Pharmacological therapy can reduce the risk of AF recurrence but carries a risk of adverse reactions and may not be tolerated.

Knowledge of factors that predict recurrence of AF after electrical cardioversion may allow tailoring of therapy for specific groups of AF patients.

More aggressive therapy may be appropriate for patients at a higher risk of AF recurrence.

Several factors have been identified that predict the risk of AF recurrence after electrical cardioversion including prolonged duration of AF, increased left atrial size, underlying heart disease, and increased heart rate variability. However, the predictive value of these risk factors is limited. ***(Brodsky MA, et al, 1989).***

Intermittent AF is precipitated by ectopic activation of the atria from the pulmonary veins in the majority of cases. However, the role of the pulmonary veins in persistent AF is less clear. Atrial tachycardia or focal ectopic beats initiate AF. Furthermore, focal atrial arrhythmias in the 2 min immediately following internal electrical cardioversion are common in persistent AF and have been shown to predict early AFrecurrence. ***(Haïssaguerre M, et al, 1998).***

Aim of the study

We hypothesized that patients with frequent premature atrial complexes (PACs) or atrial arrhythmia in the 24 h after external electrical cardioversion would be more likely to have recurrence of AF , so we aim to study the different clinical and ECG predictorsof recurrence of AF following electrical cardioversion.