The **A**trial **F**ibrillation **A**nd **S**troke **T**hromboprophylaxis in h**E**art failu**R**e

(AFASTER) Study.

Patient-centered approaches to thromboprophylaxis in heart failure with atrial fibrillation.

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CERTIFICATE OF ORIGINAL AUTHORSHIP

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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LIST OF ACRONYMS AND ABBREVIATIONS USED IN THIS THESIS

ACC: American College of Cardiology

ACNC: Australian Cardiovascular Nursing College

AF: Atrial Fibrillation

AFASTER: The Atrial Fibrillation And Stroke Thromboprophylaxis in hEart failure Study

AFFIRM: Atrial Fibrillation Follow-up Investigation of Rhythm Management trial

AHA: American Heart Association

ANZ: Australia and New Zealand

ARITOTLE: Apixaban for Reduction in Stroke and Other Thromboembolic Events in Atrial Fibrillation trial

ATRIA: The AnTicoagulation and Risk Factors in Atrial Fibrillation Study

AVERROES: Apixaban versus Acetylsalicylic Acid to Prevent Strokes in Atrial Fibrillation Patients Who Have Failed or Are Unsuitable for Vitamin K Antagonist Treatment trial.

BAFTA: The Birmingham Atrial Fibrillation Treatment of the Aged Trial

CCI: Charlson Comorbidity Index

CCU: Coronary Care Unit

CHA_2DS_2VASc: (Congestive heart failure, Hypertension, Age ≥ 75 years, Diabetes mellitus, Prior Stroke or TIA or Thromboembolism)

$CHADS_2$: (Congestive heart failure or left ventricular systolic dysfunction, Hypertension, Age ≥ 75 years, Diabetes mellitus, Prior Stroke or TIA or Thromboembolism, Vascular disease, Age 65-74, Sex category i.e. female sex)

CHARM: Candesartan in Heart Failure-Assessment of Reduction in Mortality and Morbidity Study

CHF STAT: The Congestive Heart Failure-Survival Trial of Antiarrhythmic Therapy trial

CHF: Chronic Heart Failure

CIBIS II: The Cardiac Insufficiency Bisoprolol Study II

CINAHL: Cumulative Index to Nursing and Allied Health Literature

COMET: Carvidilol Or Metoprolol European Trial

CONSENSUS: The Cooperative North Scandinavia Enalapril Survival Study

CPG: Clinical Practice Guideline

CrCl: Creatinine Clearance

CSANZ: Cardiac Society of Australia and New Zealand

DBP: Diastolic Blood Pressure

DCE: Discrete Choice Experiment

DIAMOND CHF: Danish Investigations of Arrhythmia and Mortality ON Dofetilide Study

DIG: The Digitalis Investigation Group Trial

ECG: Electro Cardio Graph

eGFR: Estimated Glomerular Filtration Rate

EHFScBS: European Heart Failure Self-care Behaviour Scale

ENGAGE: Effective Anticoagulation with Factor Xa Next Generation in Atrial Fibrillation – Thrombolysis in Myocardial Infarction 48 trial

GESICA: Grupo de Estudio de la Sobrevida en la Insuficien Cardiaca en Argentina Study

GP: General Practitioner/ Primary care physician

HAS-BLED: (Hypertension, Abnormal renal/ liver function, Stroke, Bleeding history or predisposition, Labile INR, Elderly, Drug/ alcohol concomitantly).

HEMMORR$_2$HAGES: (Hepatic or renal disease, ethanol abuse, malignancy, older age, reduced platelet count, re-bleeding risk, anemia, genetic factors, excessive falls risk, stroke)

HF: Heart Failure

HRS: Heart Rhythm Society

INR: International Normalized Ratio

LAA: Left Atrial Appendage

LVEF: Left Ventricular Ejection Fraction

MERIT HF: Metoprolol CR/XL Randomized Intervention Trial in-Congestive Heart Failure

MMSE: Mini Mental State Examination

MOCA: Montreal Cognitive Assessment

MORISKY: 4 item medication adherence self-report questionnaire

NOAC: Novel Oral Anticoagulant

NSW: New South Wales

NT-Pro-BNP: N-terminal prohormone of brain natriuretic peptide

NYHA: New York Heart Association Classification

OPTIMAAL: Optimal Trial in Myocardial Infarction with the Angiotensin II Antagonist Losartan trial

OPTIME CHF: Outcomes of a Prospective Trial of Intravenous Milrinone for Exacerbations of Chronic Heart Failure Study.

PBS: Pharmaceutical Benefits Scheme

PCC: Patient Centered Care

PRIME: The Prospective Epidemiological Study of Myocardial Infarction Study

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses

PSM: Patient Self-Monitoring/ Patient Self-Management

PST: Patient Self-Testing

RE-LY: The Randomized Evaluation of Long-Term Anticoagulation Therapy trial

ROCKET AF: Rivaroxaban Once Daily Oral Direct Factor Xa Inhibition Compared with Vitamin K Antagonism for Prevention of Stroke and Embolism Trial in Atrial Fibrillation trial.

SAFETY: Standard versus atrial fibrillation-specific management strategy to reduce recurrent admission and prolong survival: pragmatic, multicenter randomized controlled trial.

SBP: Systolic Blood Pressure

SDM: Shared Decision Making

SHARE-FI: Survey of Health, Ageing and Retirement in Europe Frailty Instrument

SOLVD: Studies of Left Ventricular Dysfunction Prevention Study

SPAF: Stroke Prevention in Atrial Fibrillation

SPORTIF: Stroke Prevention Using Oral Thrombin Inhibitor in Atrial Fibrillation Study

TGA: Therapeutic Goods Administration

TIA: Transient Ischaemic Attack

TTR: Time in Therapeutic Range

V-HeFT I and II: The Vasodilator Heart Failure Trial

VKA: Vitamin K Antagonist

WARCEF: The Warfarin and Aspirin in Patients with Heart Failure and Sinus Rhythm Study

WATCHMAN: A nickel-titanium umbrella implantable device

WHO: World Health Organisation

THESIS ABSTRACT

Background

Atrial fibrillation (AF) is a common arrhythmia in heart failure (HF) and presents a significant risk factor for thromboembolic stroke. Despite recommendations in best practice guidelines, implementation of risk stratification, therapeutic approaches for AF and thromboprophylaxis are not uniformly applied in practice.

Purpose

This study aims to identify both barriers and enablers to thromboprophylaxis in patients with HF and AF as a concomitant condition at the levels of the patient, provider and health system.

Methods

This was undertaken through a series of discrete studies, including: (1) a prospective cohort study of individuals with HF and AF at St Vincent's Hospital, Sydney; (2) bedside interviews with patients, and medical file note review; and (3) an electronic survey of cardiovascular nurses to explore their current knowledge and practice patterns.

Results

Patient level: Results of this research demonstrate that patient choice and preference were important factors in thromboprophylaxis decisions, including treatment burden, unfavorable or intolerable side effects and patient refusal. Facilitators to successful prescription and adherence were caregiver support, reminders and routine, self-testing and the use of technology. At a **health system level**, financial barriers included cost of travel; medication cost and reimbursement were important considerations.

Provider level: Survey findings revealed mixed levels of education on AF, stroke risk, anticoagulation and health behavior modification. The CHA_2DS_2VASc and HAS-BLED risk stratification tools were reported to be underused. Nurses reported key barriers to anticoagulation to include; fears of patients falling, fears of poor adherence to medication taking and routine monitoring. Additionally, patient self-monitoring and self-management were reported to be underutilized. Cardiovascular nurses reported their key role to be counselling and advising patients on therapy regimens. Anticoagulant-drug interaction knowledge was generally poor. From the medical file note review, clinician reticence included fear of falls, frailty, age, fear of bleeding and the challenges of multi-morbidity. Psychological factors included psychiatric illness, cognitive impairment and depression. Social barriers included homelessness and the absence of a caregiver or lack of caregiver assistance. The cohort study revealed that 66% of participants were prescribed an anticoagulant at discharge from hospital. Self-reported self-care behavior and 'not for CPR' were associated with not receiving anticoagulation at discharge. Whilst statistical significance was not achieved, those who were assessed as frail or having greater comorbidity, were less likely to receive anticoagulation at discharge from hospital.

Recommendations

1. Treatment decisions must be tailored to meet the needs of individuals, whilst balanced in the context of the best available evidence.

2. There is need to formalize the role of the caregiver in the management of AF and CHF.

3. Improved focus on AF within existing chronic care programs is warranted, given the aging population.

4. Developing quality patient education materials and self-management strategies are key priority areas for enhancing sustainable models of care.

5. There is scope for improvement in nurses' knowledge and practice in contemporary AF management.

6. Patient preference, choice and attributes must be considered when making complex thromboprophylaxis treatment decisions.

Conclusion

The findings of this thesis point to the need for patient-centered approaches to the management of AF in the setting of HF, as well as increased skills and competencies for nurses. This thesis demonstrates that although stroke and bleeding risk calculation are important there are other salient considerations in making clinical decisions for thromboprophylaxis including cognitive impairment, multimorbidity, self-care ability and frailty. These factors not only influence decision making on the part of provider and patient but also influence clinical outcomes. Shared decision making provides a framework for patients and providers to have quality communication, negotiate consensus and find agreements on treatment goals. These findings underscore the need for shared decision making when making complex treatment decisions around thromboprophylaxis.