PROJECT PROPOSAL

2025/6 Academic Entry Year – Cohort 4

Supervisory Team

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Project Details

Title: Improving our understanding of heart failure in women living in the UK

Summary: The gender health gap in the UK is the largest amongst the G20 countries and the 12th largest globally. Despite women constituting 51% of the population, the health and care system has been designed by men for men, with vast underrepresentation of females in research and clinical trials, education and training for healthcare professionals and in the design of healthcare policies and services. The gender bias in clinical trials has directly contributed to worse outcomes for women. Heart Failure with preserved ejection fraction (HFpEF) is a disease of multi-morbidity including both CV and non-CV comorbidities directly impacting quality of life and mortality. Non-surprisingly, women and non-white ethnicities are disproportionally affected and have poorer outcomes. We need to understand what the barriers to participating in research and health care are for females living with HF and better understand the pathophysiology of HF in women in the UK.

Leicestershire Healthcare Inequalities Improvement DTP

Aim: The aims of this project are *1)* to understand how to improve uptake of women with and at risk of Heart Failure (HF) into clinical trials *2)* to understand the female pathophysiology of HF

Background: The gender health gap in the UK is the largest amongst the G20 countries and the 12th globally.[1] In a bid to tackle this, in 2022, the government published its 10 year "*Women's health strategy for England*".[2] This included a specific call for increased participation of women in research into long term conditions. [2] The continued ethnic disparities in health and outcomes across the UK[3] further compounds this health gender gap. Again, clinical trials fail to include representative proportions of these groups, questioning once more the applicability of so called "evidence based clinical guidelines" for many under-served populations.[4]
Heart Failure with preserved ejection fraction (HFpEF) is a disease of multi-morbidity, including both CV and non-CV comorbidities, directly impacting quality of life and mortality.[5] Over 1 million people in the UK have HF[6] unsurprisingly, women and non-white ethnicities are disproportionally affected and have poorer outcomes.[7,8] There is growing evidence of underlying pathophysiological sex differences in HF which may partly explain this health disparity.[9,10] However, women experience delays in referral for and access to advanced HF therapies.[11,12] This PhD proposal aims to understand why women with HF are less likely to participate in clinical research and the barriers to accessing care. Further, to understand the pathophysiology of HF in women.

Research Plan:
Includes three independent but complimentary studies;

1. Year 1: A Systematic review to determine how evidenced based our heart failure clinical guidelines are for women.
2. Year 1: Qualitative study and PPI engagement: Undertake interviews with women with/at risk of HF to understand:
    1) the barriers and facilitators to participating in clinical research and accessing healthcare
    2) what health outcomes are important to them for improving daily living
    3) what they consider core and additional/optional investigations in a research study

    This will be supplemented with outreach work across our existing BRC PPI infrastructure to engage with women from low socioeconomic and ethnically diverse communities e.g., Braunstone dance group.
3. Year 2-3: Clinical cohort study: The information garnered from studies 1 and 2 will inform how to engage women with HF to enrol into an observational study that will improve our understanding of the pathophysiology of HF in women.

The DIAMOND-HFpEF study (NCT03050593) previously conducted by our group included 140 people with HFpEF that included 45 females and 26 matched female healthy controls. This cohort were older obese females who underwent deep phenotyping which included multi-modal imaging (MRI, echocardiography), functional capacity (6 minute walk test), medical history, fibroinflammatory plasma biomarker profiling, cardiac biomarkers, biochemistry, symptomology and anthropometrics.[13]

The student will expand this female cohort to include both younger and non-obese females by recruiting a further 45 women with HFpEF and 10 matched female controls. They will undergo the same investigations as above.

The student will undertake a comparison between the combined 90 cases of HFpEF and 36 controls to clarify the female HFpEF pathophysiology. They will explore what physiological features are associated with

1) key cardiovascular structural and functional features
2) symptomology e.g.; breathlessness

They will also utilise the UK HFpEF registry (McCann is a co-investigator (NCT05441839)). To date 591 participants have been enrolled of which 55% are females. Data collected include medical history, physical status, medication, biochemistry, echocardiography. The aim of this analysis will be to explore treatment and physical status differences between men and women with HFpEF.

Expected outcomes and impact: Student will have training in systematic reviews, design and conduct of mixed-methods research, statistical analysis and academic writing. This work will inform strategies for including women in HF-studies/trials and identify target outcomes for early interventions to improve their daily health to begin to create an evidence base

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