

Project Details	
Project Code	MRCPHS25Ex Murray
Title	Using big data to explore how hot flushes and poor sleep contribute to women's health after menopause
Research Theme	Population Health Sciences
Summary	Vasomotor symptoms (hot flushes and night sweats) and sleep problems are commonly reported by women going through the menopause. Their relationship is unclear but both are linked to adverse health outcomes like depression, cognitive decline and cardiovascular disease. This project aims to understand their relationship and whether they contribute independently to post-menopausal disease, and to explore treatments for vasomotor symptoms and sleep problems, which may in turn improve mental and physical health among women going through the menopause.
Description	<p>Background</p> <p>Menopausal symptoms are common and often debilitating. Seventy to eighty percent of women going through the menopause transition experience adverse symptoms (1). Such symptoms include hot flushes, night sweats, disturbed sleep and mood changes. They can last many years, affecting women's quality of life and ability to work, and have been linked with mental and physical ill-health. Menopausal symptoms are often interrelated, for example with women often reporting hot flushes and night sweats (vasomotor symptoms (VMS)) and sleep problems (2). However, the relationships between symptoms are unclear, e.g. whether VMS cause sleep problems, sleep problems causes VMS, or whether they are associated due to common aetiological risk factors. Further, menopausal symptoms have been identified as risk factors for adverse postmenopausal health, e.g. depression, cognitive decline and cardiovascular disease (3). Again, the causal role and interrelationships between menopausal symptoms in relation to subsequent ill health requires further investigation. It is also important to investigate underlying biological pathways that can be targeted (e.g. with new therapeutics) to relieve symptoms and in turn reduce risk of postmenopausal disease, and to consider risks and benefits of prolonged hormone replacement therapy vs. novel treatments for improving insomnia and vasomotor symptoms. These insights will benefit population health by providing a robust evidence base to advise women, health professionals, the academic community and the public.</p> <p>Aims</p> <p>The overarching aim of this project is to use epidemiological and genetic approaches (e.g. longitudinal analysis, genome wide association studies, genetic correlation analysis, Mendelian randomization, genetic colocalization) to provide robust aetiological insights into the relationship between menopausal symptoms, in particular sleep problems and VMS, and to evaluate their causal role for postmenopausal disease.</p> <p>Objectives</p> <p>The specific objectives of the project are to understand:</p> <ol style="list-style-type: none"> 1. Do different menopausal symptoms have the same underlying cause and can they cause each other e.g. do VMS cause sleep problems?

	<p>2. Do VMS and sleep problems experienced during the menopause cause post-menopausal health conditions e.g. depression, cognitive decline, cardiovascular disease, type 2 diabetes, cancer?</p> <p>3. Are the effects of VMS on ill-health independent of sleep problems? Or do sleep problems mediate or confound the relationship?</p> <p>4. What are the underlying biological mechanisms linking VMS with sleep problems, and what do these tell us about which new and existing therapies (e.g. hormone replacement therapy, neurokinin 3 receptor antagonists) might be most appropriate?</p> <p>Ownership The student will steer the project to focus in particular on certain postmenopausal health conditions of particular interest to them (e.g. depression, cognitive decline, cardiovascular disease, type 2 diabetes, cancer). They will also have the scope to analyse new and varied datasets for deriving information on VMS and sleep complaints, e.g. from electronic health records, sleep questionnaires, actigraphy assessments. While several objectives have been already defined, the student will prioritise particular research questions based on the findings of the previous objectives.</p> <p>References</p> <p>1. Woods NF, Mitchell ES. Symptoms during the perimenopause: prevalence, severity, trajectory, and significance in women's lives. <i>Am J Med.</i> 2005;118 Suppl 12B:14-24.</p> <p>2. Baker FC, de Zambotti M, Colrain IM, Bei B. Sleep problems during the menopausal transition: prevalence, impact, and management challenges. <i>Nat Sci Sleep.</i> 2018;10:73-95.</p> <p>3. Monteleone P, Mascagni G, Giannini A, Genazzani AR, Simoncini T. Symptoms of menopause - global prevalence, physiology and implications. <i>Nat Rev Endocrinol.</i> 2018;14(4):199-215.</p>
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