RACP
Specialists. Together
EDUCATE ADVOCATE INNOVATE

RACP Foundation Research Awards

FINAL REPORT

Project / Program Title		Investigating a novel, multidisciplinary exercise and rehabilitation program for patients with pulmonary arterial hypertension (PAH)
Name		Dr Karen Chia
Award Received		2016 RACP AFRM Research Development Scholarship
Report Date		1 July 2017
Chief Investigator / Supervisor		Associate Professors Eugene Kotlyar and Steven Faux; and Dr Karen Chia
Administering Institution		St Vincent's Hospital Sydney
Funding Period	Start Date:	1 January 2016
	Finish Date:	31 December 2016

PROJECT SUMMARY

Pulmonary Arterial Hypertension (PAH) is a serious cause of breathlessness due to abnormal changes in the pulmonary circulation. This disease is severe and disabling, causing limitations in physical activity, quality of life, right heart failure and ultimately death in many people. Despite recent advances in drug treatment, treatment options are limited and the prognosis of PAH remains poor. Few studies have looked at the effect of exercise on quality of life and endurance for patients suffering from PAH. Exercise is an attractive treatment modality because it is relatively cost effective, able to be done by most people and has few negative side effects. However, it is currently not known what intensity, duration and frequency of exercise would be required to manage and treat PAH.

This study is investigating a novel, multidisciplinary exercise and rehabilitation program for community-dwelling PAH patients. It is exploring the feasibility of this new program, and examining the effect it has on patient endurance and quality of life. Unlike other exercise studies, it is utilising emerging technology (cardiac magnetic resonance imaging) and gold-standard diagnostic indicators from right heart catheterisation to explore how an outpatient exercise program can affect heart function.

Thanks to the AFRM Research Development Fund, this study is now underway. The results of this study will have important implications for the outpatient treatment of PAH.

PROJECT AIMS / OBJECTIVES

This study will assess whether the proposed intervention has any effect on:

1. cardiac function (Right Ventricular ejection fraction and volume as assessed by cardiac MRI)

2. haemodynamics, measured by right heart catheterisation (RHC), the gold standard for assessing PAH
3. dominant hand grip strength and exercise capacity
4. functional capacity and quality-of-life (measured by questionnaires: the Cambridge Pulmonary Hypertension Outcome Review (CAMPHOR); Depression Anxiety Stress Scale (DASS21), and Lawton's instrumental Activities of Daily Living
5. Serum biomarkers of cardiac function and inflammation (NT-proBNP, IL-6)
6. lung function (vital capacity)

This project has so enrolled six participants. Data analysis will occur once the study is complete.

SIGNIFICANCE AND OUTCOMES

i. Developing a world class, holistic care service for patients with PAH:

Centred around the provision of high-quality, evidence-based and holistic care for our patients, this project will serve to provide a much needed service for PAH patients. It represents a unique and innovative approach to PAH management, utilising a multidisciplinary framework to address the needs of patients across numerous physical and psychosocial domains, acknowledging the effects of severe chronic illness on the whole individual.

ii. Using innovation to uncover new insight:

To our knowledge, the proposed study will be the first research to formally evaluate a PAH exercise program in the out-patient setting in Australasia. This would represent a practical, convenient, sustainable and economically viable alternative to programs that require a protracted inpatient admission. This study will also be the first exercise trial to combine functional outcome measures with specific diagnostic tests of haemodynamics and cardiac function, via right heart catheterisation and the emerging modality of cardiac MRI. In this way, it promises to reveal not only what improvements may be induced by exercise, but importantly how and why these improvements are brought about. A uniquely rich and comprehensive dataset is being collected for this study, incorporating direct measures of cardiac function, lung function, serum markers, physical strength, endurance and quality of life. This wealth of information will contribute to a much greater understanding of the pathophysiology of PAH, the patient experience of having PAH, and the potential use of exercise as a treatment modality. This will assist clinicians with their ongoing efforts to advance PAH treatment, and ideally enable more targeted and tailored exercise prescriptions to be given to patients with different PAH subtypes and severities.

iii. Harnessing the strength of multi-disciplinary collaboration:

This study is truly multidisciplinary, utilising expertise from multiple disciplines in order to better address an identified area of need. The proposed intervention brings together experts in cardiology, rehabilitation medicine, nursing, physiotherapy, exercise physiology, psychology and clinical research - all with unique skillsets to offer to the PAH population.

Furthermore, this study formalises a unique and powerful collaboration between the fields of cardiology and rehabilitation medicine. This has implications not only for PAH, but provides the foundation for extensive future collaboration in the management of numerous other conditions requiring cardiopulmonary rehabilitation.

iv. Building capacity:

This project will facilitate significant capacity building, providing less experienced clinicians with the opportunity to learn from their experienced colleagues and develop specialised skills and knowledge regarding PAH management. It will also provide staff with opportunities for mentorship

and for developing valuable clinical research skills. Together, this will contribute to higher quality clinical care and ultimately, to better management and outcomes for our PAH patients.

PUBLICATIONS / PRESENTATIONS

Chia KS, Faux SG, Wong PK, Holloway C, Assareh H, McLachlan CS, Kotlyar E.

Randomised controlled trial examining the effect of an outpatient exercise training programme on haemodynamics and cardiac MR parameters of right ventricular function in patients with pulmonary arterial hypertension: the ExPAH study protocol. BMJ Open. 2017 Feb 6;7(2):e014037. doi: 10.1136/bmjopen-2016-014037.

Chia KS, Wong PK, Faux S, McLachlan CS, Kotlyar E. The Benefit of Exercise Training in Pulmonary Hypertension: a Clinical Review. Intern Med J. 2016 Jun 24. doi: 10.1111/imj.13159. [Epub ahead of print]