RACP Foundation Research Awards

FINAL REPORT

Project / Program Title	The impact of racial and ethnic differences between Asians and Caucasians on the pathogenesis and clinical manifestations of obstructive sleep apnoea
Name	Dr Khin Hnin
Award Received	2016 RACP ResMed Foundation/Sleep Health Foundation Research Entry Scholarship
Report Date	30 March 2017
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Administering Institution	Flinders University
Funding Period	Start Date:	1 February 2016
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PROJECT SUMMARY

My PhD projects involve multiple sub-studies of the Sleep Apnoea Cardiovascular Endpoints (SAVE) study, which is an international multi-centred study, and the study has completed recruitment in 2013. The chapters are outlined:

1. A Cross sectional analysis of the factors influencing the severity of obstructive sleep apnoea based on the data from the Sleep Apnoea CardioVascular Endpoints (SAVE) Trial.
2. Direct comparison of anthropometric measurements between Chinese and Caucasians with Obstructive sleep apnoea (OSA) in order to investigate the possible underlying mechanism of the increased severity of OSA seen in Chinese subjects
3. To compare the required CPAP therapeutic pressure for OSA in Chinese and Caucasian subjects with OSA
4. To compare the differences in quality of life between Chinese and Caucasian subjects with OSA and to investigate the determinants of quality of life scores in Chinese and Caucasian OSA patients

PROJECT AIMS / OBJECTIVES

Project 1

Obstructive sleep apnea (OSA) is characterised by repeated upper airway obstruction during sleep and is associated with an increased risk of hypertension, motor vehicle accidents and neurocognitive impairment. Male gender, increasing age, obesity, craniofacial and upper airway

abnormalities, daytime somnolence measured by Epworth Sleepiness scale (ESS), snoring, breathing pauses, smoking and alcohol use have been associated with increased OSA severity. Recent studies have shown that OSA severity varies between ethnic groups and compared with Caucasians, those of Chinese ethnicity have more severe OSA after adjusting for obesity. OSA is more prevalent in subjects with CVD compared to the general public and with increasing prevalence rates of obesity globally, which could thereby lead to adverse long-term consequences of obesity, including OSA and cardio-metabolic diseases. It is largely unknown whether the same predictors of OSA severity in the general population will be applicable to subjects with CVD and with increasing OSA prevalence observed in recent years, a robust predictive model for OSA severity in subjects with CVD is necessary.

Aim: To determine the factors influencing the severity of obstructive sleep apnoea in patients with pre-existing CVD based on the data from the Sleep Apnoea CardioVascular Endpoints (SAVE) Trial

Project 2

Compared with Caucasians, Chinese OSA subjects have more severe OSA after adjusting for obesity. Although craniofacial characteristics have been shown to be partly responsible for differences in OSA severity between two ethnic groups, the previous studies involved small numbers. Previous studies lacked systematic examination of clinically available measurements of body habitus, which in tum can be responsible for OSA severity.

Aim: To compare anthropometric measurements between Chinese and Caucasians with Obstructive sleep apnoea (OSA) in order to investigate the possible underlying mechanism of the increased severity of OSA seen in Chinese.

Project 3

If increased OSA severity is due to craniofacial bony restriction seen in Chinese OSA subjects, Chinese OSA subjects will require higher CPAP pressure than Caucasian OSA subjects who have similar OSA severity to overcome the bony obstruction.

Aim: To compare the required CPAP therapeutic pressure for OSA in Asians and Caucasians.

Project 4

Some of objective measures of quality of life (i.e. vitality, physical functioning, social functioning, general health and mental health) were associated with severe OSA. All the studies were conducted on non-Asian populations however, it is now accepted that OSA affects Asians including Chinese equally or more severely. I intend to report quality of life measures of both Chinese and Caucasians with OSA and to investigate the factors, which determine the quality of life in both Chinese and Caucasian patients.

Aim: To compare the differences in quality of life between Chinese and Caucasian subjects with obstructive sleep apnoea and determinants of quality of life scores in Chinese and Caucasians

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SIGNIFICANCE AND OUTCOMES

Project 1

Significance: The predictors of OSA severity in patients with CVD has not previously been investigated and this paper will address the clinical factors, which can predict OSA severity in patients with pre-existing CVD.

Outcomes: The subject characteristics that were predictive of increased OSA severity in the SAVE cohort were Chinese ethnicity, indices of overweight and obesity, higher ESS and lower anxiety score. OSA screening tools based on clinical suspicion and obesity alone may underestimate the prevalence and severity of OSA in a multiethnic CVD population.

Proposed future research: Further research is needed to improve and evaluate pathophysiological mechanisms responsible for OSA development and severity in subjects with CVD from different ethnic backgrounds ultimately improve detection and planning of health care delivery of ethically diverse communities.

Project 2

Significance: This study will be the first paper to systematically investigate the clinically available measurements of body habitus, which in turn can be responsible for OSA severity in two ethnic groups (Chinese and Caucasians) matched for age, gender, height and weight.

Project 3

Significance: This study investigates whether the pathogenesis of OSA severity in Chinese is mainly via bony restriction by directly comparing therapeutic CPAP pressure between Caucasian and Chinese OSA patients with similar OSA severity.

Project 4

Significance: This study will be the first to report the quality of life measures affected by OSA in Chinese patients with OSA. In addition, I intend to report quality of life measures of both Chinese and Caucasians with OSA and determinants of qualify of life in patients with OSA.

PUBLICATIONS / PRESENTATIONS

Published abstracts

Hnin K, Nicholas AA, Craig A, Emma H, Zhong NS, Ferran B, et al. Predictors of Obstructive Sleep Apnoea Severity in Patients Enrolled in the Sleep Apnoea Cardiovascular Endpoint "SAVE" Trial. 860 New Insights in pathophysiology, epidemiology, and detection of sleep disordered breathing. American Thoracic Society International Conference Abstracts: American Thoracic Society; 2015. p. A3552-A.

Hnin K, Nicholas AA, Craig A, Emma H, Zhong NS, Ferran B, et.al. Do anthropometric differences explain the increased severity of obstructive sleep apnoea seen in Chinese compared with Caucasians?. Journal of Sleep Research; 2016. Volume 25, Issue Supplement S2. P1-98

Hnin K, Nicholas AA, Craig A, Emma H, Zhong NS, Ferran 8, et al. Predictors of Obstructive Sleep Apnoea Severity in Patients Enrolled in the Sleep Apnoea Cardiovascular Endpoint "SAVE" Trial. Sleep & Biological Rhythms. 12 :47-48, Oct 2014