

Polycystic Ovary Syndrome and Associated Metabolic Features in Indigenous Women in the Northern Territory

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Submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

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April, 2010

Originality Statement

I hereby declare that this submission is my own work and to the best of my knowledge it contains no materials previously published or written by another person, or substantial proportions of material which have been accepted for the award of any other degree or diploma at the University of Adelaide or any other educational institution, except where due acknowledgement is made in the thesis. Any contribution made to the research by others, with whom I have worked at the University of Adelaide or elsewhere, is explicitly acknowledged in the thesis. I also declare that the intellectual content of this thesis is the product of my own work, except to the extent that assistance from others in the project's design and conception or in style, presentation and linguistic expression is acknowledged.

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Jacqueline Boyle

April 2010

Abstract

Polycystic Ovary Syndrome (PCOS), the most common endocrinological problem in reproductive aged women, has been found in population based studies to be present in 4–8% of women from Caucasian, African American and Sri Lankan backgrounds (Asunción et al. 2000, Diamanti-Kandarakis et al. 1999, Knochenhauer et al. 1998, Kumarapeli et al. 2008). Australian Indigenous women would be anticipated to be more at risk of PCOS due to rising obesity, diabetes and associated components of metabolic syndrome. A small study of Australian Indigenous women in Victoria and Western Australia appears to support this hypothesis reporting a prevalence of PCOS of 18% (Davis et al. 2002).

This study aimed, therefore, to assess the reproductive characteristics, the prevalence of PCOS and the associated burden of diabetes, obesity, dyslipidaemia and hypertension in a group of urban Indigenous women living in Darwin, Northern Territory (NT).

A number of issues in this study warrant further attention: a high proportion of early teenage pregnancy, significant infertility, high testosterone measures and a high proportion with PCOS. Of the 424 women screened, 248 met the study inclusion criteria and of these, 38 (15.3%) had PCOS. The frequency of PCOS increased in those women who were overweight or obese by BMI; in women with a BMI $\geq 30\text{kg/m}^2$ the prevalence was 29.9%. The frequency of PCOS did not change with central obesity probably because it was the typical pattern of fat distribution in this group.

This research highlights the importance of awareness of PCOS in Indigenous women among health providers and policy makers. Whilst the majority of women with metabolic or glucose abnormalities were overweight or obese and ≥ 35 years, a significant minority were younger with normal BMI. Screening therefore should be considered for all women with PCOS for dyslipidaemia and IGT/diabetes.

Potential future research includes exploration of knowledge and attitudes to family planning and reproductive health; optimum ways to provide education and health services to Indigenous women; the identification of young women at risk of future metabolic complications and their prevention, and a comparison of androgens in Indigenous and non-Indigenous women.

Acknowledgements

The study project involved in this thesis required the collaboration of many colleagues and I wish to thank everyone involved in both the DRUID project.

Firstly I would like to thank Professor Kerin O'Dea, Professor Rob Norman, Menzies School of Health Research and the University of Adelaide for providing me with the opportunity and resources to undertake this PhD. I would also like to thank Kerin for her ongoing enthusiasm and encouragement over the course of this project.

Of the many people who assisted with this work, I would like to thank Professor Joan Cunningham and the DRUID team: Jane Lloyd, Cherie Whitbread, Karin Dunne, Kalinda Griffiths, the Chief Investigators and particularly, the DRUID study participants, study staff, members of the Indigenous Steering Group, and partner organisations.

In Adelaide I would like to thank Dr. Alan Gilmore, Ms. Michele Kolo, Mr. Brenton Bennett and Mr. Fred Amato who performed the androgen assays and measurements. I would like to thank Mr. Harmen Alberda for the androgen measurements in the non-Indigenous group of women without PCOS used for comparison with the Indigenous group.

There were many colleagues at Menzies who helped with aspects along the way; Louise Maple-Brown, Sue Sayers, Joseph MacDonnell with statistical analysis, Robyn Liddle with data management and Alice Rumbold with everything.

Thank you to Geraldine Corridon who helped me fix my document when, at the very end, it seemed to develop a mind of its own and dropped all formatting.

I gratefully acknowledge funding sources. Thank you to the following for scholarship support: Royal Australian and New Zealand College of Obstetricians and Gynaecologists Fotheringham Research Grant, 2002, National Health and Medical Research Council (NHMRC) Training Scholarship for Indigenous Australian Health Research, 2005–2009, Australian Academy of Science Douglas and Lola Douglas Scholarship, 2005–2009, and Eli Lilly. The DRUID study was funded by NHMRC Grant #236207, with additional support from the Australian Government Department of Employment and Workplace

Relations, the Clive and Vera Ramaciotti Foundation, the Vincent Fairfax Family Foundation, the Australia@Risk Partnership in Type 2 Diabetes, and Bayer HealthCare.

On a personal note I would like to thank my children Louis, Miles and Charlie. During the course of this PhD their father and I separated and he moved interstate. Such an event on its own turns a child's world upside down and my children had to cope with that and sharing their mother's time and energy with a thesis. They have been incredibly understanding and taken on sharing responsibilities at home which has enabled me to finish. I think they are more excited than I am to be submitting! This thesis would not have happened without my parents. On a number of occasions over the last few years they came up from Melbourne for significant periods of time to support me and my children practically and emotionally. I will never be able to thank them enough.

So many friends have helped in ways they aren't even aware of along the way. I would like to especially thank Nic Boyd and Doug Hardcastle and their children for many dinners, champagne and conversations on their balcony with me, the kids and the dog. They have helped sustain and nourish the whole family with fun, child minding and friendship. Kirstin Fausett has been an amazing support always and helped keep me sane through many a trying time. Even though so far away, my dearest friends Jo Settgast, Meredith Day and Simone Luscombe have always been there at the end of the phone whenever and whatever the time of day I needed to talk.

To John Condon and Joan Cunningham who provided me with support at a pivotal moment in this process. John encouraged me to believe I could do this when I thought my world had ended and my brain had gone with it. Joan Cunningham helped me get the study going, gave me a crash course in basic stata and helped me to put one foot in front of another to follow through on the belief that I could write a PhD.

Finally, Gerard, my ex-husband. We moved to Darwin together and that opened doors to a new world, including this PhD. Even though we weren't able to continue our journey together, your ongoing support enabled me to finish something we started together.

Presentations arising from this PhD

RANZCOG ASM, Perth 2006: “Reproductive health characteristics of Indigenous women in Darwin”.

Invited presentations arising from this PhD

- Fertility Society, Hobart 2007: “Fertility in Indigenous Women”
- RANZCOG ASM, Gold Coast 2007: The Dame Ella Macknight Lecture.

“Polycystic ovary syndrome and associated metabolic complications in urban Indigenous women in Darwin.”

List of Abbreviations

Abbreviation	Definition
AES	Androgen excess society
ACTH	adrenocorticotrophic hormone
ACR	albumin creatinine ratio
AIHW	Australian Institute of Health and Welfare
AMH	anti-mullerian hormone
ART	Assisted reproductive technology
ASRM	American Society of Reproductive Medicine
ATSI	Aboriginal and Torres Strait Islander
BMI	body mass index
BP	blood pressure
CAD	coronary artery disease
CHD	coronary heart disease
CI	confidence interval
CIMT	carotid intima-media thickness
COPD	chronic obstructive pulmonary disease
CRP	C-reactive protein
CVD	cardiovascular disease
DALY	disability adjusted life years
DBP	diastolic blood pressure
DEXA	dual energy x-ray absorptiometry
DHEA	dehydroepiandrosterone
DHEAS	dehydroepiandrosterone sulphate
DHT	dihydrotestosterone
DM	diabetes mellitus
DRUID	Diabetes and related disorders in urban Indigenous people in Darwin
ESHRE	European Society of Human Reproduction and Embryology
FT	free testosterone
FAI	free androgen index
FFA	free fatty acid
FSH	follicle stimulating hormone

GDM	gestational diabetes mellitus
GnRH	gonadotrophin releasing hormone
HDL-C	high density lipoprotein cholesterol
HOMA-IR	homeostasis model assessment of insulin resistance
HRT	hormone replacement therapy
hsCRP	highly sensitive C-reactive protein
IFG	impaired fasting glucose
IGF	insulin like growth factor
IGM	impaired glucose metabolism
IGT	impaired glucose tolerance
IHD	ischaemic heart disease
IL-6	interleukin 6
IMT	intima media thickness
IR	insulin resistance
IUGR	intra-uterine growth restriction
LBW	low birth weight
LDL-C	low density lipoprotein cholesterol
LH	luteinising hormone
LVH	left ventricular hypertrophy
MSHR	Menzies School of Health Research
NATSIHS	National Aboriginal and Torres Strait Islander Health Survey
NCAH	non-classic adrenal hyperplasia
NCEP	National Cholesterol Education Panel
NHF	National Heart Foundation
NIH	National Institute of Health
NICHD	National Institutes of Child Health and Development
NHMRC	National Health and Medical Research Council
NT	Northern Territory
OCP	oral contraceptive pill
OGTT	oral glucose tolerance test
PAI-1	plasminogen activator inhibitor-1
PCOS	Polycystic Ovary Syndrome
PCOS-NIH	Polycystic ovary syndrome as defined by the NIH criteria

PCOS-R	Polycystic ovary syndrome as defined by the ESHRE/ASRM Rotterdam consensus
PCO	polycystic ovaries
PID	pelvic inflammatory disease
SES	socioeconomic status
SBP	systolic blood pressure
SHBG	sex hormone binding globulin
STI	sexually transmitted infection
TFR	total fertility rate
TG	triglycerides
TNF α	tumour necrosis factor α
TSH	thyroid stimulating hormone
TVS	transvaginal scan
UKPDS	United Kingdom Prospective Diabetes Study
VAT	visceral adipose tissue
VEGF	vascular endothelial growth factor
WC	waist circumference
WHO	World Health Organisation
WHR	waist–hip ratio
WHtR	waist–height ratio
YLD	years lived with disability
YLL	years of life lost

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