

Centre for Research Excellence in the origins, outcomes and optimal management of Polycystic Ovary Syndrome (PCOS): Project support grant application

Applicant's Name: Dr Melissa Whitrow

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Research questions:

- 1) Are women with PCOS at greater risk of postnatal depression (PND); and
- 2) To what extent is PND mediated by pregnancy complications?

Alignment with the CRE New Knowledge Program research activities:

This work aligns with several areas of the CRE New Knowledge Program. It primarily relates to the topic area 'Emotional wellbeing in women with PCOS', but also has relevance to the areas "Defining the natural history of PCOS" and 'Improving fertility treatments'.

Background

Depression in the postpartum period (PND) is a debilitating condition that affects up to 16.0% of mothers in Australia (PMHC 2008). Women with PCOS may be at increased risk of PND, for a range of reasons (explored below), however, there has been scant investigation of the experiences of PND in this particular group.

A systematic review conducted as part of the Perinatal Mental Health National Action Plan (PMHC 2008) summarised the main psychosocial risk factors for perinatal depression. One of the most common predictors was a psychiatric history. By implication, women with PCOS may be more susceptible to PND due to a higher prevalence of depression and anxiety, resulting from the stress they face coping with symptoms such as menstrual irregularity, obesity and hirsutism (Barry et al. 2011, Deeks et al. 2012). However, an independent metabolic pathway has also been suggested, as relationships have been found between hormonal and metabolic profiles and psychological symptoms (Conway et al. 2014).

There are also other risk factors associated with PCOS that may compound the risk of PND. Recent stressful life events were identified as a risk factor for PND in the PMHC Action Plan (2008), and women with PCOS often face a stressful struggle with infertility prior to pregnancy (Joham et al. 2014). Indeed, infertility has been shown to increase symptoms of anxiety and depression among women (Deeks et al. 2010, Herbert et al. 2010). In addition, these infertility issues often lead to women with PCOS being more likely to seek fertility treatment (Joham et al. 2014), and these procedures are known to cause a great deal of stress to women and families (Kee et al. 2000).

A woman with PCOS also has a greater risk of pregnancy complications, which may be an additional source of stress during the perinatal period. These include pregnancy-induced hypertension and pre-eclampsia, gestational diabetes and preterm birth (Palomba et al. 2015). If the woman undergoes fertility treatments this can increase the risk of poor perinatal outcomes, or present additional complications such as miscarriage and ovarian hyperstimulation syndrome (OHSS) (Tandulwadkar et al. 2014). As dissatisfaction with the experience of pregnancy was identified as a risk factor for antenatal depression (PMHC 2008), these issues further contribute to the risk of PND for women with PCOS.

Consequently women with PCOS present with multiple risk factors for PND, as they are more likely to have had the following experiences: 1) a history of depression prior to the pregnancy; 2) a stressful time trying to fall pregnant (including the need for infertility treatments); and 3) may be at higher risk of serious perinatal complications than women without PCOS.

There is scant evidence examining the risk of PND among women with PCOS, despite this condition affecting up to 20% of the female population (March et al. 2010; Conway et al. 2014). A literature search in MEDLINE using the terms PCOS and PND (with associated terminology) retrieved 25 articles. None of these articles examined PND in women with PCOS or included this topic in any part of a study.

The aims of this study are to:

- 1) Compare the frequency of PND between women with and without PCOS, to determine if women with PCOS should be targeted for psychological support in the postnatal period.
- 2) To explore the extent to which the following factors contribute to PND (if at all) among women with PCOS: 1) maternal history of depression 2) difficulties becoming pregnant (e.g. history of infertility) 3) use of infertility treatment 4) a history of pregnancy complications.
- 3) To use this information to improve awareness of the emotional difficulties women with PCOS may face when seeking to become pregnant.

Methods

STUDY DESIGN: Cross-sectional study of 416 women who had a live birth, derived from a cohort established retrospectively at around age 30, in Adelaide, South Australia.

PARTICIPANTS/MATERIALS, SETTING, METHODS: Data will be derived from a questionnaire in which women reported PCOS and pregnancy details. A comparison of the frequency of PND will be made between 47 women with PCOS, diagnosed using the Rotterdam criteria, and 369 women without this diagnosis. Potential mediating factors will be considered, including, a prior depression diagnosis, difficulties becoming pregnant (e.g. prior miscarriages, ectopic pregnancies), seeking assistance to becoming pregnant (e.g. IVF), and complications during pregnancy (e.g. high blood pressure, pre-eclampsia).

ANALYSIS: A description of the PCOS and non-PCOS population will be made, and compared using parametric or non-parametric tests, as appropriate. Logistic regression will be used to assess the association (if any) between PCOS (exposure variable) and PND (dependent variable). Mediating variables will be added to the models to determine the extent to which this affects any association between PCOS and PND. The following confounding variables will be considered in the models: obesity, age and life stressors/social support (an index of socio-economic status will be used as a proxy).

Significance

If left untreated PND has a significant impact on the health and welling of the woman and her family (PMHC 2008). It can affect her ability to function at work and home, and particularly care for her child, impacting the child's health and development. Furthermore, a psychiatric illness in the perinatal period has been identified as the leading cause of maternal suicide (PMHC 2008). A woman with PND is also at greater risk of substantial weight retention after birth (Herring et al. 2012), which may exacerbate the risk that PCOS women have for obesity. Therefore, if women with PCOS are identified as having an increased risk of PND, they could be targeted for additional postnatal support, particularly following infertility treatment.

Expected outcomes

A peer reviewed manuscript describing the frequency of PND among women with PCOS, and an exploration of the factors that may exacerbate or mediate PND among this group.

Addressing the selection criteria

- 1) This project will identify and fill a knowledge gap concerning modifiable factors that may severely impact on the emotional wellbeing in women with PCOS. It will also have the potential to refine the treatment for PCOS by indicating specific groups of women with PCOS that may benefit from counselling and additional postnatal surveillance for mental health problems.
- 2) Feasibility – The data for the analysis and the staff to carry out the study are currently available. Dr Wendy March, an epidemiologist, has detailed knowledge of the dataset to be used in this analysis, and has performed a number of the previously published analyses of the Lucina cohort study. Chris Davies, biostatistician, is also familiar with the dataset and could undertake the high-level analysis (imputation etc.).
- 3) Research & translation plan – literature review, cleaning and selecting data from database, analysis of data, manuscript preparation, presentation of work at key conferences, preparation of a research brief to be disseminated to key stakeholder groups e.g. PCOS alliance, FSA, ESA.

Summary budget

Salary and increments as per University of Adelaide schedule as of Sept 2015

Biostatistician: HEO7, Step 5 \$ 87,880
 \$ 114,244 Total salary with on costs
 4 m at 0.4 FTE
 \$15,080 Proposed cost of analysis.

References

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