Exploration and confirmation of factors associated with uncomplicated pregnancy in nulliparous women: prospective cohort study

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STUDY QUESTION Which variables at 15 and 20 weeks' gestation, particularly those amenable to modification before pregnancy, are associated with a subsequent uncomplicated pregnancy?

SUMMARY ANSWER Normalising body mass index, increasing fruit intake before pregnancy, reducing blood pressure, stopping misuse of drugs, and being in paid employment are all associated with subsequent uncomplicated pregnancy outcomes.

PARTICIPANTS AND SETTING

5628 nulliparous women with singleton pregnancies recruited to the Screening for Pregnancy Endpoints (SCOPE) study in Auckland, New Zealand; Adelaide, Australia (exploration (n=2129) and local replication (n=1063) datasets); London, Manchester, and Leeds, United Kingdom; and Cork, Republic of Ireland (external confirmation dataset (n=2432)).

DESIGN, SIZE, AND DURATION

Prospective observational multicentre cohort study, between November 2004 and August 2008. Of the 5628 women, 3452 (61.3%) had an uncomplicated pregnancy.

Unadjusted risk ratios for variables associated with subsequent uncomplicated pregnancy remaining significant in log probability regression model for external confirmation dataset (n=2432)	
Variables	**Risk ratio (95% CI)**
Decreased risk of uncomplicated pregnancy/detrimental	
Body mass index at 15 weeks' gestation:	
≥30 (*v* <25)	0.74 (0.65 to 0.84)
25–29.9 (*v* <25)	0.87 (0.80 to 0.94)
Mean blood pressure (per 5 mm Hg increase) at 15 weeks' gestation:	
Diastolic	0.92 (0.91 to 0.94)
Systolic	0.95 (0.94 to 0.96)
Misuse of drugs in first trimester*	0.90 (0.84 to 0.97)
Increased risk of uncomplicated pregnancy/beneficial	
Prepregnancy fruit intake at least 3 times/day	1.09 (1.01 to 1.18)
Hours worked in paid employment (per 8 hours increase) at 15 weeks' gestation	1.02 (1.01 to 1.04)

*Use of marijuana, cocaine/crack, amphetamines, 3,4 methylenedioxymethamphetamine, opiates, hallucinogens, and binge alcohol >6 units/session.

MAIN RESULTS AND THE ROLE OF CHANCE

Unadjusted risk ratios for potentially improvable variables associated with subsequent uncomplicated pregnancy remained significant in log probability regression models in the external confirmation dataset. Detrimental factors not amenable to alteration were a history of hypertension while using oral contraception, socioeconomic index, family history of any hypertensive complications in pregnancy, vaginal bleeding during pregnancy, and increasing uterine artery resistance index. Smoking was noted to be a detrimental factor in the initial two datasets but did not remain in the final model.

BIAS, CONFOUNDING, AND OTHER REASONS FOR CAUTION

We attempted to reduce confounding by inclusion of terms for all major explanatory variables. Exploration of variables in the development dataset was followed by replication and confirmation in two other datasets, one local and one external, increasing the robustness of the associations. The variables in the final model are consistent with biological plausibility, but the predictive nature of these variables requires validation in different cohorts.

GENERALISABILITY TO OTHER POPULATIONS

The study invited nulliparous women with no major medical conditions to participate, to assist in identification of risk factors without the additional complexities of preexisting medical conditions. This enables the findings to be generalised to other similar populations of healthy pregnant women, but not automatically to other groups (nulliparous women with medical disorders or multiparous women).

Lucy C Chappell,[1] Paul T Seed,[1] Jenny Myers,[2] Rennae S Taylor,[3] Louise C Kenny,[4] Gustaaf A Dekker,[5] James J Walker,[6] Lesley M E McCowan,[3] Robyn A North,[1] Lucilla Poston[1]

[1]Division of Women's Health, Women's Health Academic Centre, King's College London and King's Health Partners, UK
[2]Maternal and Fetal Health Research Centre, Manchester Academic Health Science Centre, University of Manchester and Central Manchester Foundation Trust, UK
[3]Department of Obstetrics and Gynaecology, Faculty of Medical and Health Sciences, University of Auckland, New Zealand
[4]The Irish Centre for Fetal and Neonatal Translational Research (INFANT), Department of Obstetrics and Gynaecology, University College Cork, Republic of Ireland
[5]Department of Obstetrics and Gynaecology, Lyell McEwin Hospital, University of Adelaide, Australia
[6]Reproduction and Perinatal Health Research Group, University of Leeds, St James University Hospital, Leeds, UK

Correspondence to: L C Chappell; lucy.chappell@kcl.ac.uk

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