**Is the timing of the first antenatal visit associated with adverse birth outcomes? Analysis from a population-based birth cohort**

Dr Nisreen A Alwan, PhD1

Professor Paul J Roderick, PhD1

Professor Nick S Macklon, MD2

1Academic Unit of Primary Care and Population Sciences, Faculty of Medicine, University of Southampton, Southampton, UK

2Academic Unit of Human Development and Health, Faculty of Medicine, University of Southampton, Southampton, UK

Corresponding author: Dr Nisreen A Alwan

Room AC23, Public Health Sciences and Medical Statistics

South Academic Block, Level C, Mailpoint 805

Southampton General Hospital

Tremona Road, Southampton, UK

SO16 6YD

Tel: +44 (0) 2381 204776

E-mail: n.a.alwan@soton.ac.uk

Source of funding:

None

Competing interests:

None

Author contributions:

NAA – idea conception, data analysis and interpretation, writing of the abstract’s first draft

NSM and PJR – study design, data interpretation and abstract writing

All authors have reviewed and approved the final draft of the abstract.

The authors are not early career researchers.

**Background**

Adequate antenatal care can improve maternal and child health outcomes. The UK National Institute for Health and Care Excellence (NICE) recommends the first antenatal visit with a healthcare professional to occur by 10 weeks gestation. The WHO Focused Antenatal Care Protocol recommends it to occur no later than 16 weeks gestation. We aimed to examine the associations between timing of the first antenatal ‘booking’ visit and adverse birth outcomes including low birthweight, preterm birth and stillbirth.

**Methods**

Antenatal and delivery records from a population-based cohort comprising of all women receiving maternity care at University Hospital Southampton, UK during 2000-2013 were analysed (n=74,449 pregnancies of which 64,739 had delivery data). We conducted multiple logistic modelling to assess the associations of interest. All models computed a cluster-robust standard error of the difference to account for clustering in women with more than one pregnancy included.

**Findings**

The number of pregnancies with booking timing information was 74,220. Mean gestational age at booking was 12.6 weeks (sd=5.3), with 21,482 (29%) of pregnancies having their booking visit by 10 weeks, 45,015 (61%) by 12 weeks, 59,986 (81%) by 14 weeks and 65,755 (89%) by 16 weeks. Of the 64,246 live births, 4,009 (6.2%) were low birthweights (<2500g) and 4,253 (6.6%) were preterm births (<37 weeks). There were 302 (0.5%) stillbirths.

Pregnancies with booking visit after 16 weeks gestation were more likely to lead to low birthweight (OR=1.2, 95% 1.04-1.4, P=0.01, adjusted for maternal age, body mass index, blood pressure, parity, ethnicity, employment status, educational attainment, alcohol consumption, smoking, infertility treatment, baby’s sex and gestational age). Booking after 14 weeks was associated with preterm birth (OR=1.3, 95% CI=1.2-1.4, P<0.0001, adjusted for all the above except gestational age). Using the NICE cut-off of 10 weeks, there were no significant associations with low birthweight (adjusted OR =1.1, 95% CI 1.0, 1.2, P=0.1) or preterm birth (adjusted OR=1.0, 95% CI 0.9, 1.1, P=0.7). There was no association between booking timing and stillbirth (adjusted OR for the 10-week cut-off=1.1, 95% CI 0.8, 1.5, P=0.5).

**Interpretation**

Delayed first antenatal visit (1 in 10 women after 16 weeks and 1 in 5 women after 14 weeks gestation) was associated with adverse birth outcomes. However, this relationship could represent residual confounding. A Cochrane review found no effect of reduced versus standard number of antenatal visits on preterm birth and low birthweight1, however all included trials recruited women after booking. Emphasis on early booking in primary care is recommended.

Reference:

1. Dowswell, T., G. Carroli, L. Duley, S. Gates and A. Gülmezoglu (2015). "Khan-N eelofur D, Piaggio G. Alternative versus standard packages of antenatal care for low-risk pregnancy." Cochrane Database of Systematic Reviews(7).