Reviewer’s report

Title: Maternal Vitamin D Status, Gestational Diabetes and Infant Birth Size

Version: 0 Date: 06 Jul 2017

Reviewer: Kathryn Hart

Reviewer's report:

Abstract:

Could the rationale for the interest in birth weight be clarified (if word limit allows) as there is no background given as to why this was chosen as a secondary outcome.

The rationale for only studying those of normal weight is unclear (when you are interested in the relationship between Vitamin D and birth weight).

Could you state prevalence of Vitamin D deficiency/insufficiency in abstract too before you start looking at associations between GDM and Vit D?

You state that both >80 and >50 are optimal Vit D levels for pregnancy. Whilst this may be explained in the main paper I think it would be useful to make it clear (in the abstract too) where these two recommendations arise from/why they are different.

Line 155 'The diagnosis of GDM WAS based on a two-hour 75 g oral… (missing word)

Line 166 'The normality of the variables was visually inspected. Outliers (n = 18) of 25(OH)D concentrations were omitted’ - this does not sound very robust? How did you define your outliers? These should be defined statistically and the method for doing this clarified.

Line 177 repeated measures ANOVA (missing word)

Line 182 - prevalence of Vitamin D

Line 188 - 'with Bonferroni correction when applicable adjusted for maternal length' - what does 'length' mean? Do you mean weeks gestation or maternal height?

Line 191 - 'in the models presented a slight problem regarding multicollinearity' - can you be more specific rather than 'slight problem'? How was this managed once identified?

Table 1 - p values for GWG values are missing

Line 222 - needs rewriting 'Parallel in UCB, the adjusted analysis showed similar

223 25(OH)D concentrations in GDM and non-GDM mothers (79.1 ± 2.3 vs 80.1 ± 0.8 nmol/L, P = 224 0.69) (Fig. 1).’ - presume you mean similarly in UCB… and then I would state these are
the concentrations in the cord blood of infants born to women with/without GDM (rather than 'in' the women directly)

Line 249 'As compared to mothers with suboptimal pregnancy 25(OH)D, mothers with optimal pregnancy 25(OH)D had heavier newborns (P = 0.010), but this positive association was not verified in linear regression (B 0.00; 95% CI -0.00, 0.01; P= 0.16). Newborn head circumference was larger in those with suboptimal UBC 25(OH)D compared with mothers with optimal UCB 25(OH)D (P = 0.003).' - are you presenting comparison with one vit D measure (preg) and one outcome (weight) and another (UCB) for the next outcome (head) because these were the only significant associations (e.g. pregnancy vit D was not sig associated with head circumference and UBC vit D was not sig associated with birthweight) or were these associations decided a priori?

You are critical of the previous cross sectional studies yet the longitudinal nature of this study (two time points) is not exploited as there does not appear to be any analysis of change in Vit D status over time (and given the adequacy of Vit D levels in the sample this is unlikely to be informative) and all analysis is based on cross sectional associations. This is recognised in the discussion ('However, in a cross-sectional setting causal relationships cannot be determined.') so the criticism of cross sectional studies in the introduction is perhaps misplaced.

Line 318 - could you discuss the clinical significance of the reduced head circumferences seen, i.e. were the differences seen clinically relevant? This is touched on in the conclusion but some discussion of possible mechanisms and consequences would be beneficial.

Line 334 slight rephrasing 'A further limitation is that the OGTT was not performed on all mothers'

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
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Yes

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