Reviewer's report

Title: Weak grip strength unveils vitamin D deficiency A cross-sectional study of pregnant and newly pregnant women in Sweden

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Reviewer: Carol C.L. Wagner

Reviewer's report:

This report is an important first step in deciphering the effects of vitamin D deficiency on daily living tasks that involve muscular strength. The authors' inclusion of pregnant women adds to the mounting evidence that vitamin D deficiency has adverse effects on the health outcomes of both the mother and her developing fetus. The inclusion of two groups of women at latitude 60 degrees with such dichotomy in vitamin D status improved the ability to detect differences between the two groups of women.

Given the need to control for season, the study design and sample size calculations appear appropriate for the scientific question posed--does 25(OH)D status influence muscle strength in two groups of women living at latitude 60o. The methodology for measuring grip strength and overall muscle strength seems appropriate. One issue is the higher rate of continued breastfeeding during pregnancy in the Somali women compared to the Swedish women. This potential confounded must be controlled for in a regression analysis because the changes that occur during lactation that seemingly follows a recent pregnancy could impact on muscle strength as the woman has a different hormonal profile and may have depleted certain other nutrients during her recent pregnancy, lactation and now new pregnancy. Likewise, because women were recruited at different gestational ages, gestational age at time of strength measurement should be included in the model.

Other comments:

(1) the following sentences needs to be rewritten for clarity: "Thus, anything preventing UV light from reaching the skin will reduce the production of vitamin D3 exemplified by long transportation in air of sun rays, dark skin pigmentation or veiling clothes [11]." The phrase "long transportation in air of sun rays" is not easily understandable in its present form.

(2) Page 4, sentence "From other countries it is reported that dark-pigmented women tend to have adverse fetus growth and delivery outcome [19, 23, 24]", please elaborate more on these aspects--what are the specific growth and delivery outcomes. There are two additional studies to include by Hollis and Wagner (2012) and Wagner et al (2013) on the adverse outcomes of pregnancy associated with vitamin D deficiency that will strengthen your position.

(3) It is not clear when the strength tests were performed and how the blood samples were obtained if ..."A list was provided by the antenatal clinic containing
the names of 118 Somali women (21 months backwards) and 309 Swedish women (9 months backwards)." Please rewrite this section as later it is stated the women had their strength testing performed within two weeks of their 25(OH)D measurements.

(4) the statistical analysis section needs to be expanded to include how potential confounded such as breastfeeding, gestational age at time of evaluation, and parity were controlled. Specifically, it is not sufficient to state "Multiple linear regression models with stepwise exclusion in main effect models were used to examine the effect of 25-OH D on physical grip strength." What was included in these models needs to be specified.

(5) another potential confounded is whether or not the woman was postpartum and had recently undergone a cesarean section--this could significantly affect strength results, particularly if the woman had undergone cesarean section, had significant blood loss, and was on narcotics. These factors need to be addressed.

(6) on page 8, "The Somali women with low categories of 25-OH D had particularly high PTH levels indicating long-standing skeletal depletion." please provide references for this statement and expand--how long does it take for the PTH to rise during pregnancy? What effect does concurrent lactation or recent delivery have on PTH, if any?

(6) Page 10, paragraph 2: please expand on what sociocultural factors might have accounted for the difference.

(7) in the Discussion, this section needs to be rewritten or omitted because it seems subjective: "Another consequence of low 25-OH D in plasma might be poor intrauterine contractions [18, 20]. Overall, the Somali women in our county more often had an emergency section compared to the Swedish women, but this was because their fetus was small for gestational age (personal information). Here, two of the 23 Somali women had had, or later had, emergency sections." SGA does not automatically necessitate an emergent C/S.

(8) Discussion, page 11, next to last paragraph, "This paper adds information that vitamin D deficiency is a frequent and a long-standing condition with metabolic and target organ consequences in this high-risk population." We really do not know how long-standing the deficiency was because the women were not followed over time. You can infer that the condition existed for a certain period in those with elevated PTH but the duration is truly unknown.

(9) the following needs to be modified in the last part of the Discussion: "...winter and a wash-out effect of inter-individual variations of exposure to UV light by also including dark-pigmented study persons wearing veiled clothing." It is unclear what is meant by a "wash-out effect of individual variations..."

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published
Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests.