Reviewer's report

Title: Factors associated with ultrasound-aided detection of suboptimal fetal growth in a malaria-endemic area in Papua New Guinea

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Reviewer: Enrico Ferrazzi

Reviewer's report:

This manuscript provides an important insight in the interplay of poor socioeconomical conditions, parasitic infections and fetal growth.

This study could add a real genuine new information on the interplay of low socio economical environment, major proxy of maternal nutrition, parasitic infection and fetal growth

I hope that the authors who did an incredible enormous efforts for this study could accept the major work required by the revision that I am suggesting

MAJOR COMPULSORY REPORTS

ABSTRACT

Please state the aim of the study after the background

FGR and SGA are used as if interchangeable, please use FGR for low fetal weight gain and SGA for cross sectional data (estimated U/S weight vs newborn weight charts, or observed newborn weight vs newborn weight charts.)

This should be a special strength for the prospective work: longitudinal U/S measurements to identify low weight gain or progressive restriction of growth, instead of simple weight at birth,

INTRODUCTION

METHODS/RESULTS

Line 168 to 175

EFW/BW below the 10th centile does not allow to diagnose a FGR. The problem of reference chart is critical also for simple assessment of SGA: Hadlock could not be used I suppose in such a different macroethnicity. This is not a limitation this is a main problem for the interpretation of results.

The methods and the results as far as fetal weight, growth, newborn weight are quit confusing and biased by inappropriate reference charts.

If we look at U/S biometry we find very interesting data. The very interesting info is reported in TABLE 1 supplement. As expected, HC is not significantly different between SGA and AGA whereas AC is significantly lower.

This is of relevant significant to the interpretation of findings.
I would suggest that longitudinal findings used to diagnose fetal growth restriction should be based on Abdominal Circumference Zed score and NOT on estimated weight Zed score, that is less sensitive to growth faltering in utero.

If you introduce a different criteria in the method then you can keep the two assessment together (cross sectional and longitudinal)

This could be criteria n° 1: fetuses who underwent longitudinal interrogations were classified as low growth gain according to the AC zed score.

Criteria n° 2 for cross sectional assessments could be the AC as reported by the Intergrowth Study


Papageorghiou AT1, Ohuma EO2, Altman DG3, Todros T4, Cheikh Ismail L1, Lambert A1, Jaffer YA5, Bertino E4, Gravett MG6, Purwar M7, Noble JA8, Pang R9, Victora CG10, Barros FC11, Carvalho M12, Salomon LJ13, Bhutta ZA14, Kennedy SH1, Villar J15; International Fetal and Newborn Growth Consortium for the 21st Century (INTERGROWTH-21st).

Table 1 describes an interesting aspect of the association between parity, partner generating income (socioeconomic level of the family) and late fetal growth restriction

Table 1 supplement is interesting too as I said before it contains clues to the interpretation of fetal growth.

I suggest that it be included in the main manuscript, I would suggest that birth weight being a selecting criteria be moved in the indicator line and not among results, birth weight goes with gestational age and the two lines should be moved together up in the indicator line.

Assessment and clear classification of poor fetal growth (mixed longitudinal and cross sectional data) is the key issue of the genuine new results of this work.

I suggest that relationship with socio, biological variable should be reassessed after a more consistent classification of fetal growth.

MINOR ESSENTIAL REVISIONS

INTRODUCTION

This is a secondary analysis performed on a cohort of women recruited and randomized to an interesting two anti-malaria drug regimens.

Outcome are not based on un blinded data, and the two arms are presented as a single cohort

assuming that the two regimens do not influence the outcome or that the two
regimens together might represent the real life variability of different antimalaria regimens.

I suggest that this should be briefly presented in the Introduction and should be commented as a limitation of the study in the discussion. This is even more needed since the main paper is not yet available as a published contribute.

METHODS/RESULTS

Albendazole should presented as an antihelmintc drug, this is not immediately clear to those who do not work with tropical medicine

In conclusion:

1. The aim should be clearly stated also in the abstract
2. The Ultrasound data, criteria of classification, reference charts should be completely readdressed
3. socio biological data are unique, genuine and worth correlating with fetla growthin utero
4. The results and discussion should be rewritten after appropriate classification of fetal growth in utero

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I have no conflict of interest