Reviewer's report

Title: Birth weight by gestational age and congenital malformations in Northern Ethiopia

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Reviewer: Monica Rittler

Reviewer's report:

The authors describe and correlate birth weight, gestational age at birth and the presence of congenital anomalies (CA) in infants born in two hospitals during a 6-months period.

1. On the one hand, one of the hospitals is a teaching or reference hospital, probably with a high coverage of pregnancies at risk. On the other, the results were obtained from less than 1% of the population (page 4, last paragraph). Therefore, validity of the comparisons of results with other populations is questionable.

2. The proportion of deliveries for each hospital should be given, as well as the available facilities for prenatal diagnosis (ultrasound etc.). For the 32 cases with CA it should be established if, or at least the possibility mentioned that referral occurred because of a prenatally detected malformation. The types and proportions of observed CA suggest referral. The authors should take all this into account as a limitation or adjust their results.

3. The results in text and figures are hard to interpret. For instance, (page 9, last paragraph) "... prevalence of severely underweight .... (60%)..."

The origin of this value is unclear to me.

4. The numbers shown in tables and figures should add up to the totals.

5. Page 6, line 5: the statement "There were no SGA infant was born to mothers with <= 2 previous offspring" seems wrong to me. The phrase "born at 40 weeks" should be added, as shown in Fig. 1.

6. Replace table 1 with a general table, with the overall information, number of mothers and infants for each group of each variable etc.

7. For small samples, proportions in the text should not be expressed as percentages, but rather as x/total.

8. Clarify how circles and squares represent absolute values, for instance in Fig. 1.

9. Fig 2: Panel A with the largest column belonging to infants with birth weights <= 1000 g seems wrong to me. How were the percentages (26% and 56%)
obtained?
Indicate in Fig. 2 that panel C refers to males and D to females.

10. Table 3: Number (N), not Frequency.

11. The results regarding sex ratio are interesting, but perhaps would require a larger sample to establish consistency.

12. Page 6, last sentence of next to last paragraph: "This remarkable difference in survival .... was responsible for the higher prevalence of females...." on the one hand, makes no sense. On the other, and in this context, different male/female survival as responsible for the higher female prevalence has not been demonstrated.

13. A sex ratio decline at higher parities has been discussed in the literature (Ruder, 1985), while thereafter, other authors have shown that such a decline was due to advanced maternal (Juntunen et al., 1997) and even paternal (Jacobsen et al., 1999) ages. The authors should discuss this point further and relate it to their results in Table 2.

14. Abstract: The authors should explain why the excess of CNS anomalies underscores the conclusion that the poor neonatal outcomes reflect the harsh local conditions.
See also page 3, last paragraph: ".... and especially the type ...."

15. In summary, by increasing the sample size and adjusting for referral, results useful for the overall population, regarding the correlation among birth weight, gestational age, and parity may be obtained.

16. In this context, however, the role of congenital anomalies is less clear. To conclude on a possible relationship with environmental factors, the incidence and its eventual excess should be more precisely established for each CA, as well as comments on specific CA/environmental factor relationships may improve the discussion.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests