Reviewer's report

Title: Blood pressure in primary school children in Uganda: a cross-sectional survey

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Reviewer: Telmo Pereira

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Kidy and colleagues present an interesting and quite pertinent paper, addressing the prevalence and determinants of high blood pressure (HBP) in children and adolescents in Uganda. They report a prevalence of 17.1% at the initial evaluation, with age, female gender, body mass index (BMI) and soil-transmitted helminths as the main determinants for HBP. The prevalence of HBP was reduced to 3.8% when repeated measurements were considered for those with HBP at the first evaluation, a phenomenon already reported in previous papers, that stresses the need to perform several blood pressure measurements for an accurate definition of the BP profile at these ages. HBP at these young ages is clearly under-studied and poorly described, although there’s a consensual knowledge that it results from a complex and multi-componential physiopathological process, incorporating the interaction amongst genetical, environmental and behavioural factors. The interaction amongst these interplaying factors makes it extremely difficult to isolate single determinants, or to identify the individual weight for each isolated factor. Moreover, other aspects emerge as crucial towards a good characterization of BP at these early stages in life.

One Major aspect refers to the blood pressure methodology, not only in terms of overall procedure, but also regarding the devices used for measuring BP. On the other hand, the criteria for blood pressure classification are also crucial for identifying accurately HBP. So, notwithstanding the merits of this investigation by Kidy and colleagues, some major questions should be carefully addressed before publication should be considered.

1. The device used for BP measurement in this study (OMRON M6) is not yet been validated for the measurement of BP in children and adolescents. Although the device was validated for adults, its accuracy cannot be extrapolated for the paediatric populations, and therefore the internal validity of the study is seriously compromised. In a recent study, Flynn argues that “BP values obtained using oscillometric devices should not be used for the diagnosis of hypertension in children. (1) This has led the US and European guidelines to recommend that BP elevation in children should be confirmed by auscultation, preferably with a standard mercury sphygmograph. (2,3) There’s no evidence in the paper indicating that such recommendation was followed.

2. The classification of BP based on the US percentiles could not be appropriated for this population, as there are biological idiosyncrasies that could make such
extrapolation highly imprecise. This has for example motivated the publication of BP percentile tables in several European countries, not just for BP but also for height and BMI. Ideally, there should be an effort for creating specific tables for African paediatric populations, as the US tables could lead to under or overestimations of the real dimension of the problem.

3. Characterization tables with descriptive statistics must be provided for the all sample and for the subgroups considered in the analysis. The prevalence of overweight should also be provided, and the prevalence of HBP stratified according to the BMI classification. It must also be described the representativeness of each age stratum, overall and for gender, as we cannot appreciate whether the sample is well balanced across the all age range.

4. The authors provide data regarding the HBP condition, but not regarding the intermediate BP classification – pre-hypertension or high-normal BP classification (BP between 90 and 95 percentile), or the stages of HBP (stage 1 or stage 2). These data must be provided, and additional multivariable analysis performed.

5. It would have been interesting to check the BP change over time of the first visit prehypertensive children and adolescents, as some could progress to HBP classification.

6. Socioeconomic data would have added valuable information, as well as nutritional information, in terms of caloric intake, nutritional balance and importantly, salt ingestion. Also, physical activity data is an important absence in this study.

7. No reason for the higher prevalence of HBP in female is presented.

8. The Odds Ratios are sometimes different in the text comparing with table 1 (e.g. see the adjusted OR for age, in the abstract and table 1). A thorough revision of the results must be done. Also, in the abstract the BMI is not indicated as a major determinant of HBP, and it should be, considering that BMI has been identified as an independent determinant of HBP at these young ages in practically all related-research.

9. In table 2, the legend indicates b) as adjusted Odds Ratio, but the data presented are Mean and Adjusted Mean differences, indicating that a parametric hypothesis statistical test was applied, supposedly the Student t test or the One-way ANOVA. This table must be clarified.

10. Much of the identified arguments strongly limits the external validity of the research, notwithstanding its merits and indisputable scientific relevance.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

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.