Author's response to reviews

Title: Determinants of Academic Performance in Children with Sickle Cell Anaemia

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RESPONSE TO REFEREES’ COMMENTS

Referee 1

Minor Essential Revision

- 1. Sample determination:- prevalence of 50% in an infinite population cannot give a sample size of 86 - ?? Please review!

Response: Prevalence of 50% in an infinite population (>10,000) gives a sample size of 384. However, our study population is not infinite. So subjecting the above figure (384) to further calculation/equation [1] using our study population size gives minimum sample size of 86.

- 2. Consent and ethical approval:- was consent obtained from the parents/ caregivers of the control group? This is not stated.

Response: Yes, consent was obtained from the parents/caregivers of the control group. This has been stated in the manuscript.

- 3. The researchers did not clearly state what they consider to be poor academic performance; I suspect it is the low scorers. This should be clearly stated

Response: Low overall scorers were considered as having poor academic performance. This has been clearly stated in the manuscript.

- 4. In Tables 7 and 8 the authors appear to have lost focus, this study is on determinant of academic performance in children with SCA, not on determinant of academic performance and intelligence. Please the authors should relate academic performance with severity ie hospital admission(s) and blood transfusion(s)

Response: Done. Academic performance was related to measures of severity (blood transfusion, hospital admission and VOC) while the relationships of these severity measures with intelligence were removed.

Discretionary revision

- 1. Tables and figures are too many- tables 6, 7 and 8 can be collapsed with figures 2 and 4 to form one table.

Response: Table 6 and figures 2,3,4 were collapsed to form one table (table 6) while tables 7,8 and figure 5 formed a single table (table 7).

- 2. The discussion of the relation between IQ and severity of disease seems out of context

Response: The discussion of the relation between IQ and severity of disease has been changed to discussion between academic performance and severity of disease.

- 3. The background section is rather long! It can be edited and shortened to half its current size without loss in quality.

Response: The background section has been edited to a reduced size.

Reference

Referee 2

Major Compulsory Revisions

1. The supporting literature is not up-to-date. Many of the cited references are from the late 1980s and early 1990s, and one of the foundational references (Chordokoff and Whitten, 1963) has subsequently been challenged by multiple studies that have shown significant neurocognitive deficits in children who experience stroke, silent cerebral infarct, and even those with no neuroimaging abnormalities who demonstrate as much as a 1 SD decline in function over the school-age years of life (Wang et al, 2001). Recent papers have also reported decreased function in children with indeterminate Transcranial Doppler (TCD) flow rates (e.g, Boni et al), and a strong association between poor neurocognitive function and low hemoglobin in neurologically intact adults with SCA (Vichinsky et al, JAMA, 2010). The failure to address these more current reports detracts from the interpretation of the results of the study.

Response: All the cited references of 1980s and early 1990s, including Chodorkoff and Whitten 1963, have been removed except reference number 34 in the old manuscript (now reference number 32) because it is the reference of the validation and standardization of DAPT in our environment. Recent studies/reports that showed significant neurocognitive deficits in children with SCA and those that associated measures of severity with neurocognitive dysfunction have been duly included and reviewed in appropriate sections of the manuscript.

2. The use of the DAPT as the primary measure of intellectual function is a limitation, since this test does not assess verbal function and relies on functions that have been documented as being at risk in children with SCA (e.g., visual-motor coordination, processing speed). Because of this narrow focus, the DAPT may over or under-estimate cognitive function in individual children. This issue should be addressed by the authors.

Response: The Stanford-Binet test of intelligence is a standardized test of intelligence but its main drawback is that it relies heavily on verbal items [1]. Wechsler intelligence Scale for Children (WISC) overcame this drawback (having separate verbal and performance IQ tests) but it is advised that it should be adapted to the country’s population before being used [2]. Draw-A-Person Test (DAPT) is the IQ test that has been validated and standardized for use in our environment [3]. It has a strong correlation (0.62) with Stanford-Binet test and WISC [3]. It is a standard, objective and reliable scoring test of IQ which tests non verbal intelligence [4].

3. One of the major differences between this study and some of the published studies on academic achievement is that the published studies used a standardized measure of academic achievement while this study used averages of more subjective grades. These grades are dependent on the grading practices of the individual teachers, and cross-teacher reliability was not assessed. The authors should provide a rationale for this measurement strategy and provide some discussion of this limitation.

Response: This has been provided in the manuscript. There is no validated academic achievement measure in Nigeria, hence, this study employed the use of school examination report. This measure has been used previously for the assessment of academic performance of school children. However, varying standards between individual teachers may affect this measurement strategy. This, however, may be regarded as a limitation of this study.
Discretionary Revisions

- 4. One of the major differences in this cohort and the other published studies is the high rate of malaria, something that is rare to non-existent in the US, UK, or other countries. This could be a significant unique factor in school absenteeism and should be emphasized as a difference in the paper.

Response: The difference highlighted here has been emphasized in the manuscript.

- 5. Pain resulting in hospitalization is but one mechanism for school absenteeism. Eaton et al found that children who were not hospitalized for pain still experienced a significantly higher number of school absences than healthy controls. It would be helpful to know how much daily pain not requiring hospitalization was associated with absence.

Response: An explanation on this has been given in the manuscript.

- 6. The finding that academic scores declined between 6 to 9 years and flattened thereafter is consistent with the finding of Wang et al (J Pediatrics, 2001) of decline in intellectual function over time in children with no abnormal neuroimaging evidence.

Response: This has been reflected at the appropriate section of the discussion.

- 7. The section on use of blood transfusion is confounded, since the need for transfusion could affect absence, intellectual function, and achievement, but receiving chronic transfusion may improve function. Some additional attention to this relationship should be included in the paper.

Response: Additional attention on the relationship between blood transfusion and intellectual function, and achievement has been included in the manuscript.

N.B.- New inclusions/corrections in the manuscript has been highlighted in coloured text.

References


The advised formatting changes were made during the revision of the manuscript.

Thank you for your extensive review of our article.

We look forward to its acceptance for publication.

Yours Sincerely,

Dr Ezenwosu.