Reviewer’s report

Title: Comparative study of sickle cell anemia and hemoglobin SC disease: clinical characterization, laboratory biomarkers and genetic profiles

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Reviewer: Sergei Nekhai

Reviewer's report:

In this study, Marilda de Souza Gonçalves and colleagues analyzed haplotypes and clinical parameters SCD patients from Bahia geographic are in Brazil. The authors identified hemoglobin, haplotypes and the presence of thalassemia. The study shows that SCD patients with Benin (BEN) haplotype and those lacking Central African Republic (CAR) haplotype exhibited higher levels of HbF. Overall, this is an interesting cross sectional analysis which shows milder forms of sickle cell anemia in patients with HbSC hemoglobin and thalassemia. Also HbSC patients showed higher levels of retinopathy. I found may misspells which I tried to correct (see below). I would like the authors to clarify few major points: what is the medical care for this patients beyond the use of antibiotics and folic acid? Also is it know whether SCD patients are predisposed to cardiovascular disease as stated? I also suggest to add some experimental data to freshen up the presentation.

Major comments/suggestions:

- Please describe whether SCD patients are treated with blood transfusion or hydroxyurea.

- page 12, lane 284: Low cholesterol levels in SCA and HbSC are likely to decreased a risk of cardiovascular disease, and not to increase it as stated. The Greg Kato's study (ref [39]) is about platelet activation, so this is may be a different mechanism, not foamy cell formation. I suggest to clarify this point.

- I suggest to add information on the primers that were used to detect different haplotypes. I also would like to see examples of the gels on which the restriction reactions were resolved for BEN, CAR and atypical haplotype. The original reference (1989) is a bit too old, so an update would be welcome.
Misspells/ minor corrections:

Page 2, lane 35: "SC disease (HbSC) contributing to characterize the sickle cell disease…” - this phrase is unclear. Please modify.

lane 41: "associated to endothelial" change to "associated with".

Page 3, lane 55:" the βS allele, is characterized", remove comma ( "the βS allele is characterized")

lane 57: "chain, consists” change to "chain and consists"

lane 58: "health, and both" change to "health, as both"

lane 67: "deletion of α-thalassemia" change to "deletion of α-globin chain in α-thalassemia"

lane 69: "lowers polymerization" change to "lowers hemoglobin polymerization"

lane 71: "in hematological and biochemical [5,6,7]." Of what? Is this "in hematological and biochemical parameters of SCA [5,6,7]."?

Page 4, lane 78: " some laboratory biomarkers are important", unclear. Is this "development of novel laboratory biomarkers are important"?

Lane 89: "of the different" change to "of different"

Page 7, lane 155 "31.5% (63/200) had a brother with the disease, " only male relatives were reported? If not, probably better "31.5% (63/200) had a sibling with the disease,"

Lane 159: "In the south coast” change to "On the south coast"

Page 8. Lane 183: "We observed in the biomarkers of hemolysis the red blood cell " probably better" Among the biomarkers of hemolysis, the red blood cell " 
Page 9, lane 223: "In the geographic region of our study, we found high occurrence of SCD at patients of the south coast of Bahia." This sentence needs to be changed, something like that: 
Analysis of the geographic distribution of SCD conducted in our study showed high occurrence of SCD patients on the south coast of Bahia."

Page 10, Lane 225: "Specialized care located in the city of Itabuna facilitates patient access to health care and support." I suggest to change, something like that:" Specialized care facility located in the city of Itabuna facilitates patients access to health care and provides support."

Lane 227: The beginning of the peopled of Itabuna started firstly with the cowboys from Sergipe, in 1867, when they also immigrated to Vitória da Conquista [25]." Best to change, something like that: "Itabuna was initially settled in 1867 by cowboys from Sergipe, when they started to immigrate to Vitória da Conquista [25]."

Lane 231: "In 1730 and 1790, pioneers braved the wilderness and natives" does not sound correct. Probably better "Between 1730 to 1790, pioneers began to settle in the wilderness and among the natives".

Lane 234: "As a result, Ilhéus and Itabuna had a significant influence of many Brazilian natives" better "As a result, Ilhéus and Itabuna population had a significant influence from Brazilian native people".

Lane 234: "In addition, people from different tribes and African regions came from South Africa and landed in the port of Ilhéus during the slave trade." Probably better "In addition, slaves originated from from different African tribes and African regions were brought from South Africa to the port of Ilhéus during the slave trade period."

Lane 241: "the Congo and Angola: change to "Congo and Angola".

Page 12, lane 295: "As demonstrated in our results,..." please rephrase, either "As demonstrated in our study" or "...by our results."

Page 19, figure legend: "The SCD patients followed by the Reference Center in South Coast, Extreme South, Southwest Bahia." Probably better as "Distribution of SCD patients on South Coast, Extreme South and Southwest of Bahia."

Table 1, change "brothers" to 'siblings" if I am correct.
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

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I am able to assess the statistics

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