Reviewer's report

Title: Diffusion Tensor Imaging in Neuropsychiatric Systemic Lupus Erythematosus

Version: 2 Date: 12 April 2010

Reviewer: Ping-Hong Yeh

Reviewer's report:

Re: Rex E Jung, Arvind Caprihan, Robert S Chavez, Ranee A Flores, Janeen Sharrar, Clifford R Qualls, Wilmer Sibbitt and Carlos A Roldan
Diffusion Tensor Imaging in Neuropsychiatric Systemic Lupus Erythematosus

Summary of the 2nd revision of manuscript:

The revised manuscript has addressed the major concerns and answered most of the major criticisms. In addition, the revised manuscript has included additional TBSS analyses in axial and radial diffusivities as suggested by one reviewer. However, there are still some aspects should be addressed and clarified before the manuscript can be recommended for publication.

1. The definitions and calculation of axial and radial diffusivities needed to be mentioned briefly.

2. The DTI data was acquired obliquely “along the anterior commissure/posterior commissure line”, but how the gradient vectors were corrected for image orientation is not clear, as stated by “This program also outputs the gradient direction tables after correction for image slice orientation”. The examples of color FA map should be provided for review purpose in order to prove the rightness of processing.

3. Since the two DTI sets were not averaged, but only concatenated, the statement of “The DTI experiment was repeated twice to increase signal-to-noise ratio” may not be justified.

4. Were the “eddy current correction” performed for each DTI set separately before concatenated or “FLIRT” to the same b=0 image afterwards? “The algorithm registers images of both the DTI measurements to a common image”, “common image” may be changed to “b=0 image”. The statement of “The data is not averaged for the next step.” is redundant, and should be deleted.

5. The degrees of freedom (df) of between and within group for the F-tests of demographics comparisons should be included in the results.

6. How had the df = 31 for “comparing NPSLE to SLE patients (df = 31)” of total 33 patients, after including age and gender covariates, been calculated?
7. The consistent subcortical white matter lesions of SLE patients at the frontal and parietal regions in Table 2 do not support the argument of “due to the non-overlapping lesion burden of the SLE cohort as compared to the NPSLE cohort.” Are there any significant clusters in SLE groups if lower thresholding value, say t>2, is used for permutation test?

8. The higher MD, AD and RD in corona radiata can be explained by the lacunar infarct of NPSLE, or simply because of pathological changes at the place where fibers cross, i.e. in the Figure where the labeled anterior corona radiata is the crossing of anterior corona radiata, superior corona radiata, and superior longitudinal fasciculus, and thus became more directional in one way.

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

**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