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LETTER

Early white matter changes on diffusion tensor imaging in amyotrophic lateral sclerosis

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We read with interest the article by Gabel et al. about a study on mean fractional anisotropy (FA) values on diffusion tensor imaging (DTI) of white matter tracts implicated in amyotrophic lateral sclerosis (ALS) of 154 patients with ALS.[1] The authors concluded that there is data-driven evidence for early involvement of corticospinal tracts and body of the corpus callosum in ALS.[1] We have the following comments and concerns.

The authors did not differentiate between bulbar and limb onset ALS. Since MRI findings differ between these groups,[2] we should know how many of the 154 ALS patients had bulbar and how many limb onset ALS. Data should be reevaluated with regard to these two groups of patients.

Furthermore, it is unclear how many of the included patients had familial ALS (fALS) and how many had sporadic ALS (sALS). Knowing the proportion between fALS and sALS is crucial as patients with fALS may exhibit particular patterns of subcortical white matter changes,[3] which may strongly influence the results of DTI studies. With regard to fALS, we should be informed in how many of the 154 patients the family history was positive for ALS.

A parameter, which was not included in the evaluation, is the disease duration. Since ALS is a progressive disorder, it is crucial to know the stage of the disease and disease duration at the time the imaging investigations were carried out. Since degeneration of the cortico-spinal tracts may strongly increase with progression of the disease, results of DTI investigations may strongly depend on the disease stage. Knowing the age at onset is not sufficient as onset of ALS may vary considerably between patients.

Since the existence of the inferior longitudinal fascicle and its anatomic description is under debate,[4] we should know why the authors included this questionable anatomic/functional structure in their evaluation. Since the inferior longitudinal fascicle is considered as one of the major occipitotemporal association tracts, connecting the anterior temporal lobe with the extra-striate cortex,[5] we should know in which way this tract is affected in ALS. No reports about the involvement of this tract in ALS are available.

Overall, this interesting study has a number of shortcomings, which need to be addressed before drawing final conclusions. Particularly required are the proportion of bulbar/limb onset ALS, the proportion of fALS/sALS, the disease duration, and a discussion about the affection of the inferior longitudinal fascicle in ALS.

Author Contribution

JF: concept, writing literature search, discussion, FS, CS: literature search, critical remarks, discussion.

Conflict of Interest

There are no conflicts of interest.

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