뇌신경재활

게시일시 및 장소 : 10 월 18 일(금) 13:15-18:00 Room G(3F)

질의응답 일시 및 장소 : 10 월 18 일(금) 15:45-16:30 Room G(3F)

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Differences in white matter abnormalities between concussion and diffuse axonal injury

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Objectives

Differences in white matter (WM) features between concussion and diffuse axonal injury (DAI) have not been reported. We investigated differences in WM microstructure abnormalities between concussion and DAI by using a tract-based spatial statistics (TBSS) approach.

Methods

Eighty-one consecutive patients with traumatic brain injury and 43 age- and sex-matched control subjects were recruited. We classified the patients as concussion or DAI group members. Voxel-wise statistical analysis of fractional anisotropy (FA) data was performed by using TBSS implemented in the FMRIB Software Library. We calculated mean FA values across the skeleton and within 48 regions of interest (ROIs) based on the intersection between the FA skeleton and the probabilistic Johns Hopkins University white matter atlases. We selected 20 ROIs that showed the lowest FA value ratios between the concussion and DAI groups.

Results

Comparing the concussion and control groups, FA values of the concussion group were significantly lower than those of the control group in 13 ROIs ($p < 0.05$). For the DAI and control groups, FA values of the DAI group were lower than those of the control group in all ROIs ($p < 0.05$). The FA values of the DAI group were significantly lower than those of the concussion group in all 20 ROIs ($p < 0.05$).

Conclusions

The corpus callosum and its adjacent neural structures, the brainstem and its adjacent neural structures, the long neural tracts, and the subcortical WM of the DAI patients exhibited more severe injury than those of the concussion patients.

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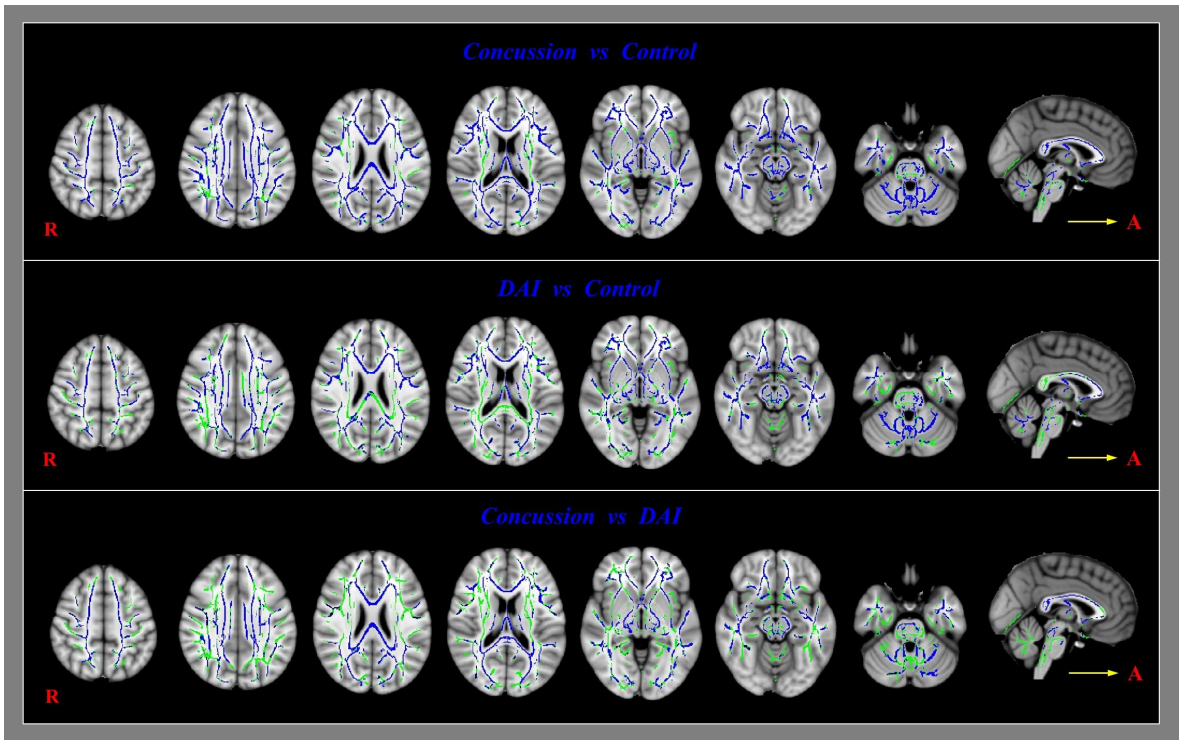

Figure1. Results of tract-based spatial statistics analyses comparing fractional anisotropy (FA) values of the concussion, DAI, and control groups. The blue voxels represent areas with significantly decreased FA values, and significant voxels are overlain on the mean white matter skeleton (green). DAI: diffuse axonal injury.