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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Intrinsic network properties and cognitive function after mild traumatic brain injury

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Introduction

To investigate the association between characteristics of intrinsic functional connectivity in mild traumatic brain injury (mTBI) patients and their cognitive function assessed by computerized NeuroCognitive Function Test (CNT).

Methods

Ten individuals with mTBI and nine controls were included (mean age 42.9±13.7 years, 41.4±14.3 years, respectively). Resting state functional magnetic resonance imaging data were acquired within 30 days after injury (3T Siemens scanner). CNT scores were acquired measuring attention, memory, and executive cognitive function. Brain imaging data was preprocessed using the FSL (v6.0.1). Brain signal of the 116 regions of interest (ROIs; from Automated Anatomical Labeling template) was extracted from the preprocessed and bandpass filtered time series data. Positive correlation matrix was constructed individually across the ROIs and thresholded considering the sparsity of the matrix (the number of edges was the same between individuals, the size of the connected components was the largest). Betweenness centrality (BC) and local efficiency (Eloc) were estimated. Spearmans' correlation coefficient between the sub-scores of CNT test and the values of BC or Eloc was estimated with controlling for age in each group. Statistical significance was set at $P < 0.001$.

Results

In mTBI group, for BC, positive correlation was observed in the left middle temporal pole with scores of visual learning test A1; the number of words recalled in first trials (r=0.901) and delayed recall test (r=0.907). Positive correlation was observed in the right parahippocampal area with scores of word reading test (r=0.958). Negative correlation was observed in the Vermis 1,2 and left dorsolateral superior frontal area with scores of word reading test (r=-0.936 and -0.945 respectively). For Eloc, no significant correlation was

observed. In control group, for BC, negative correlation was observed in the right middle temporal pole with scores of visual learning test A5 (r=-0.941). For Eloc, the left middle frontal area and scores of forward digit span test was positively correlated (r=0.959), while the left middle occipital area and scores of visual learning test A5 was negatively correlated (r=-0.944).

Conclusion

The finding indicates that BC and Eloc are relevant to represent altered intrinsic functional connectivity caused by mTBI.

Acknowledgment :National Research Foundation of Korea (NRF) 2018R1C1B6002554 and 2017R1A2B3005912