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Correlation with Cerebral White Matter Hyperintensity and Rehabiliation Outcome in brain stem stroke

Dong Hwan Yun[1][†], Jong Ha Lee[1], Seung Don Yoo[2], Dong Hwan Kim[2], Seung Ah Lee[2], Jinmann Chon[1], Yun Soo Soh[1], Yong Kim[1], Young Rok Han[2], Yeocheon Yun[1][*]

Kyung Hee University Medical Center, Department of Physical Medicine & Rehabilitation[1], Kyung Hee University Hospital at Gangdong, Department of Physical Medicine & Rehabilitation[2]

Objective
Cerebral white matter hyperintensities (WMHs) are a common finding on magnetic resonance imaging (MRI) in elderly persons and patients with cerebrovascular diseases. The pathogenesis of WMHs has known to be closely related with ischemic pathogenesis. Previous studies have shown that WMHs are also related to cognitive impairment, gait disturbance, motor compromise and global functional decline. Brain stem stroke minimally affect the cognitive function than other parts of the stroke, so we can hypothesize that cognitive impairment was related with WMHs. The Purpose of this study was to determine whether a functional improvement is associated with severity of WMH.

Method
Eighty brain stem stroke patients were enrolled. WMHs was evaluated by the Fazekas scale and the Scheltens scale. All participants were divided into two groups based on the severity of WMH according to Fazekas scale. Mild WMH group was defined as patients with Fazekas scale 0,1 and severe WMH group was defined as Fazekas scale 2,3. Functional status was assessed by the modified Barthel Index (MBI) Score and functional gains were determined by using absolute and relative Methods calculated from the MBI score. The absolute functional gain (AFG) is the MBI score difference between first assessment and assessment when they were discharged, and the absolute functional efficiency reflects the functional gain per day. General characteristics and functional improvement were compared between the groups. Student T-test and Mann-Whitney test were performed to analysis relation between Fazekas scale and absolute functional gain, absolute functional efficiency.

Result
Mean age of patients was 64.72±13.27 years. AFG was 23.73±10.20 in mild group, 19.29±15.14 in severe group and there were no significant differences. Age, length of stay, the initial NIHSS score, MFT also showed no significant differences. Initial MBI score, MMSE and absolute functional efficiency in the mild WMH group (51.03.±18.52, 26±4.15, 1.00±0.59) were significantly higher compared to the severe WMH group (38.06±21.81, 23±6.73, 0.65±0.27, p<0.05). There was a significant correlation between Fazekas scale and absolute functional efficiency (p<0.05).

Conclusion

In our study, the severity and extent of WMHs are significantly correlated with the cognitive impairment and poor efficiency of functional improvement in patients with ischemic stroke at brain stem. The WMHs could be considered as one of factors that can influence functional recovery during rehabilitation of stroke patients with WMH.