SS 05 NR-07 10:40 English

Diagnostic performance to identify the cerebrovascular reactivity by arterial spin labeling MR in patients with moyamoya disease

Tae Jin Yun[1], Jin Chul Paeng[1], Chul-Ho Sohn[1], Moon Hee Han[1], Hyun-Seung Kang[1], Jeong Eun Kim[1], Byung-Woo Yoon[1], Seung Hong Choi[1], Ji-hoon Kim[1], Kee-Hyun Chang[2]

[1]Seoul National University Hospital, [2]Soonchunhyang University Hospital Bucheon, Korea.

neurorad63@gmail.com

PURPOSE: The diagnostic accuracy to identify the cerebrovascular reactivity (CVR) by arterial spin labeling (ASL) MR in patients with moyamoya disease is unclear.

MATERIALS AND METHODS: We conducted a prospective study to examine the accuracy of ASL as compared with single-photon emission CT (SPECT) in patients with moyamoya disease. Preoperative ASL and SPECT images from 78 adult patients with moyamoya disease were analyzed. Regions of interest consisting of internal carotid artery (ICA) and middle cerebral artery (MCA) territories, and anatomical structures wereapplied to the spatially normalized cerebral blood flow maps from basal and stress ASL and SPECT. The correlation between cerebrovascular reactivity indexes (CVRIs) from ASL and SPECT was analyzed by a using Pearson correlation analysis and thearea under the receiver-operating-characteristic curve (AUC) was used to evaluate diagnostic accuracy relative to that of SPECT for various cutoff points by CVRI.

RESULTS: Significant relationships were observed between CVRIs from ASL and SPECT for ICA, MCA, and anatomical structure (correlation coefficient $r = .7293$, $p < .0001$, $r = .7344$, $p < .0001$, and $r = .6518$, $p < .0001$, respectively). The diagnostic accuracies of ASL for detecting ICA and MCA territories, and anatomical structures, in which CVR are extremely impaired (for ICA and MCA territories; CVRI < −8%, for anatomical structures; CVRI < −20%), revealed AUCs of 0.93, 0.91, and 0.85, respectively.

CONCLUSION: ASL can identify the reduced CVR with excellent performance andhas the potential as a noninvasive imaging tool for determining CVR in patients with moyamoya disease.