

Motor Function and Diffusion Tensor Imaging in the Hyperacute Intracerebral Hemorrhage Strongly Predict Functional Motor Outcome.

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Purpose: Predictive models stratify functional recovery following intracerebral hemorrhage (ICH), but ability to be able to predict motor outcome is still suboptimal. We determined whether clinical scores and diffusion tensor imaging (DTI)-derived data in the hyperacute phase of ICH improves prediction of motor outcome.

Methods and materials: Multimodal MRI including DTI was performed on patients with ICH in the first 12 h after symptom onset. We assessed ICH and perihematomal edema location and volume and CST displacement or involvement by ICH. We calculated affected corticospinal tract (CST)-to- unaffected CST ratios for fractional anisotropy (FA), mean diffusivity (MD), and axial (AD) and radial diffusivities. The degree of paresis was graded by the motor subindex scores of the mNIHSS. Motor outcome at 3 months was classified as good (mNIHSS 0-3) or poor (4-8).

Results: Of 62 consecutive patients, 49 patients were included for analysis at 3-months follow-up (37 men; median age 69.5 years). At admission, median NIHSS was 11.5 (IQR5-17), and 25 (71.4%) had some motor deficit (median mNIHSS4). Motor outcome was poor in 13 (22.41%). Independent predictors of outcome were NIHSS, mNIHSS, rMD at posterior limb of internal capsule (PLIC), PLIC-rAD, rFA of the whole CST (wrFA), PLIC-involvement by ICH, 72h-NIHSS and 72h-mNIHSS. The sensitivity, specificity, and positive and negative predictive values for unfavourable motor outcome at 3 months by combined mNIHSS>6 and PLIC-involvement<12h were 84%, 80%, 64%, and 94%, respectively (AUC 0.91, CI0.82-0.99).

Conclusion: Combining motor function and PLIC damage may predict the functional motor outcome in patients with hyperacute ICH.

