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Position-cortical coherence as a marker for somatosensory integrity early post-stroke, a prospective cohort study.

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Introduction: Neurophysiological assessments in addition to clinical scales can potentially elucidate the role of somatosensory function in post-stroke motor recovery.
Main objective: To investigate the longitudinal construct validity of position-cortical coherence (PCC), the agreement between evoked wrist perturbations and EEG, as a measure of afferent integrity, with respect to longitudinal recovery of sensorimotor function.
Methods: PCC was measured serially in 48 patients after a first-ever ischemic stroke, in addition to Fugl-Meyer motor assessment of the upper extremity (FM-UE) and Erasmus modification of the Nottingham Sensory Assessment (EmNSA), within 3, 5, 12 and 26 weeks post-stroke. Change in PCC over time represented by: percentage presence of PCC (%PCC), mean amplitude of PCC over the affected hemisphere (Amp-A) were addressed as well as their association with FM-UE and EmNSA. Patients were classified into: expected-fitters (FM-UE-baseline=18 points), unexpected-fitters (FM-UE-baseline←18 points) and non-fitters (FM-UE-baseline←18 points), to the proportional recovery model.
Results and discussion: %PCC increased from baseline to 12 weeks post-stroke (ß:1.6%, CI:0.32-2.86%, P=0.01), which was no longer significant after adjusting for EmNSA and FM-UE. A significant positive association was found between %PCC, Amp-A and EmNSA. Unexpected fitters (N=8) showed longitudinally significantly higher %PCC than those expected to fit the proportional recovery model (N=23).
Conclusion: We demonstrated the longitudinal construct validity of %PCC and Amp-A as a measure of afferent pathway integrity. A high %PCC in unexpected fitters suggests that this marker contains information above afferent integrity, i.e. cortical excitability. More work is needed to improve clinical prediction models for functional outcome post-stroke.
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