

Measuring neuroplastic changes after acute burn: Laterality recognition

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Background: Acute burn injuries cause significant pain and dysfunction, and represent a substantial risk for transition to a chronic pain problem. Acute pain, particularly when accompanied by neural tissue injury, is known to be associated with rapid neuroplastic changes throughout the neuraxis, including organisational changes in cortical areas that subservise sensorimotor function of the painful body part. It is thought that these changes may be maladaptive and contribute to poor outcome. The left/right judgement task is a simple clinical test that may offer insight into the integrity of centrally held maps of the painful area. There is a significant amount of work investigating left/right judgement performance in chronic pain but little work on acute clinical pain. The aim of this study was to test the reliability of the left/right judgement task using the Recognise™ programme in people with an acute upper limb burn.

Method: Patients with acute unilateral upper limb burns performed the hand laterality recognition test (n=30) three times in the single testing session. Each repeat of the trial consisted of 10 images.

Results: Intra rater reliability for speed was excellent with Lin's concordance correlation coefficient (LCCC) 0.845 with a 95% confidence interval (CI) of 0.74-0.95 whilst accuracy revealed moderate reliability with a LCCC of 0.56 and 95% CI of 0.3-0.81. The minimal detectable difference to be interpreted during use by burn clinicians, for speed was 0.24 sec and accuracy was 0.33%.

Conclusion: The hand laterality recognition measure has excellent intra-rater reliability for speed, moderate reliability for accuracy on the burnt limb and is sensitive in detecting small differences which may be of use assessing neuroplastic brain changes in the acute burn patient population.

Key Words

Acute burn; upper limb; outcomes; laterality; neuroplasticity.

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