

Appraisal

Critically appraised paper: Unilateral neglect impairs functional recovery but evidence for upper limb interventions in patients with neglect is lacking

Synopsis

Summary of: Doron N, Rand D. Is unilateral spatial neglect associated with motor recovery of the affected upper extremity poststroke? A systematic review. *Neurorehabil Neural Repair*. 2019;33:170–187.

Objective: To review the evidence as to whether there is a relationship between unilateral spatial neglect and motor or functional recovery of the upper limb after stroke, and to examine if sensorimotor interventions improve upper limb function in people with unilateral spatial neglect after stroke. **Data sources:** MEDLINE, EMBASE, CINAHL, and Cochrane CENTRAL searched up to February 2018. **Study selection:** Observational or experimental studies of adults with stroke that included at least one outcome measure each for unilateral spatial neglect and upper limb function, and were available in English. Case studies and intervention studies that targeted unilateral spatial neglect without measuring upper limb function were excluded. **Data extraction:** Two reviewers extracted the data. Methodological quality was assessed using a modified Quality Index checklist. **Data synthesis:** Of 850 studies initially identified by the search, 14 studies with a total of 1074 participants met the selection criteria and were included. Thirteen of these studies examined relationships between unilateral spatial neglect and upper limb recovery, and one examined the effect of an upper limb intervention in patients with unilateral spatial neglect. Studies were rated as fair to good quality. Ten of the 13 observational studies found that a relationship existed between unilateral spatial

neglect and upper limb recovery such that the presence of neglect was associated with poorer functional outcome. This finding was consistent in both acute and chronic stroke. Differences in the measures used to assess unilateral spatial neglect and upper limb function, as well as variations in severity of upper limb impairment and severity and type of unilateral neglect may have contributed to inconsistencies across studies and prevented pooling of data. In the single experimental study, which examined the effects of a task-specific upper extremity intervention on functional performance in patients with unilateral spatial neglect more than 6 months after stroke, there was a significant but small improvement in upper limb function. **Conclusion:** Although there is evidence that unilateral spatial neglect is associated with poorer functional recovery of the hemiparetic upper limb after stroke, there is currently very little experimental research evaluating the efficacy of upper limb interventions in people with unilateral spatial neglect. Further research is required to guide upper limb rehabilitation for patients with neglect after stroke.

Provenance: Invited. Not peer reviewed.

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Commentary

The heterogeneity of stroke challenges clinicians and researchers. Systematic reviews therefore serve a valuable role in promoting evidence-based practice and stimulating innovative research questions. According to the authors, unilateral spatial neglect is a 'well-researched phenomenon'. Indeed, prior neuroimaging work identifying key anatomical substrates of neglect¹ supports their claim. Yet, in their analysis of treatment efficacy in unilateral spatial neglect, one out of 850 (0.1%) articles met the criteria. The authors' 'unanticipated' observation underscores current challenges (and opportunities) in stroke rehabilitation research.

A lack of transparency in stroke rehabilitation trials is a common issue. Inconsistent reporting of stroke features, methodology, and treatment parameters ultimately hinders clinical advancement. Efforts to ameliorate rigor and reproducibility in stroke rehabilitation research are underway, including establishing a universal set of clinical assessments and intervention reporting/monitoring guidelines.² Notably, the primary focus of these efforts is in the sensorimotor domain. To positively impact clinical practice, researchers must implement similar research practices to other stroke behavioural phenotypes (neglect, aphasia, apraxia) and design intervention studies concentrating *exclusively* on these phenotypes.

Current treatment approaches in unilateral spatial neglect involve top-down and bottom-up strategies emphasising compensation and attention

system training, respectively.³ Addressing longstanding clinical questions related to dosage optimisation and treatment responders versus non-responders across unilateral spatial neglect subtypes and severity levels, for instance, will prove more valuable than conducting additional low-powered trials. Existing strategies employing repetitive task-orientated training⁴ and attention control tasks⁵ show promise. Might combining these treatment strategies boost motor outcomes in unilateral spatial neglect? Lastly, formulating conclusive statements on upper limb treatment efficacy in unilateral spatial neglect also depends on elucidating motor and cognitive system interplay during stroke recovery.

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