Stroke

COCHRANE CORNER

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Interventions for Perceptual Disorders in Stroke: A Systematic Review

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Perception is the ability to recognize and interpret information from our senses. It is fundamental to an individual's ability to understand and interact with their environment. Disorders of perception are common after stroke, reducing quality of life. Research evidence relating to effectiveness of interventions is unclear. This Cochrane review update and expansion assessed the effectiveness of interventions for perceptual disorders after stroke.[1]

METHODS

We searched key online databases including CENTRAL, MEDLINE, and Embase from inception to August 2021. We also searched trial and research registers and screened the reference lists of included studies.

We included randomized controlled trials (RCTs) of any intervention targeting perceptual disorders following stroke and affecting hearing, taste, touch, smell, somatosensation, or vision. We excluded deficits of sensation, for example, visual field loss or attention, for example, neglect.

One reviewer screened titles for eligibility. Two reviewers independently screened abstracts and full-text articles.

Data extraction and risk-of-bias assessment (using the Risk of Bias-1 tool) were conducted by one reviewer and checked by a second; evidence quality was appraised using the Grading of Recommendations, Assessment, Development, and Evaluations tool.

We compared the benefits of active interventions with no treatment, control, or alternative active interventions, on stroke survivors' activities of daily living, our primary outcome measure, and other outcomes. Meta-analysis used Review Manager software and a random-effects model.

We involved lived experience (4 people) and clinical expert (4 people) stakeholder groups throughout the review.

RESULTS

Of 94 434 records identified, we included 18 RCTs (541 participants, 535 [98.9%] stroke survivors).

Hearing, Taste, and Smell

No RCTs were found.

Somatosensation

Interventions included robot-assisted gait training, standard physiotherapy, mirror therapy, and transcranial direct current stimulation.

One RCT (n=24) compared active intervention (transcranial direct current stimulation) to control. Activities of daily living were assessed via the Korean modified Barthel index. Analysis showed no difference between groups (mean difference, 10.08 [95% CI, −2.47 to 22.63]; P=0.12); the evidence was assessed as being very low quality.

Three RCTs compared one active intervention (computerized balance and movement training) with another

Key Words: perception ■ quality of life ■ review ■ stroke ■ vision, ocular

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For Sources of Funding and Disclosures, see page e240.

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active intervention (standard Pusher syndrome physiotherapy) (n=80 with Pusher syndrome). Activities of daily living were assessed using the Korean modified Barthel index. Analysis showed the computerized therapy was more effective than standard physiotherapy (mean difference, 10.19 [95% CI, 4.94–15.44]; *P*=0.0001); there was no heterogeneity (I^2=0%) and very low-quality evidence.

Touch

Interventions included pressure sense training and hand exercises with an assistive glove.

One RCT (n=24) compared one active intervention (hand exercises with robotic glove) and another active intervention (conventional hand exercises) using the modified Barthel index. Analysis showed no difference between the interventions (mean difference, −0.41 [95% CI, −12.31 to 11.49]). Evidence was very low quality.

Vision

Interventions included repeated figure drawing, computer-based games, and therapist-led functional activities.

Two RCTs (n=96) comparing one active intervention with another measured activities of daily living using the modified Barthel index; data were not combined due to intervention differences.

DISCUSSION

Limited evidence currently exists to determine the effectiveness of any intervention for perceptual disorders impacting any sensory modality.

Clinicians should continue to provide neurorehabilitation for perceptual disorders according to the current clinical guidelines.

High-quality trials are needed on interventions for perceptual disorders in stroke. Trials should have sufficient participant numbers, usual care comparisons, and measure longer term functional outcomes.

ARTICLE INFORMATION

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Acknowledgments

We acknowledge the invaluable contribution of our clinical and lived-experience stakeholders. Dr Nicolson is a stakeholder representative, United Kingdom.

This article is based on a Cochrane Review published in The Cochrane Library 2022, Issue 11 (see www.thecochranelibary.com for information). Cochrane Reviews are regularly updated as new evidence emerges and in response to feedback, and The Cochrane Library should be consulted for the most recent version of the review.

Sources of Funding

This project is funded by the National Institute for Health Research (NIHR) Health Technology Assessment (NIHR 128829). The views expressed are those of the authors and not necessarily those of the NIHR or the Department of Health and Social Care. Dr Hazelton is funded by the Stroke Association, United Kingdom (SA L-NC 20\100003). The Nursing, Midwifery, and Allied Health Professions Research Unit, Dr Brady and Dr Todhunter-Brown are funded by the Chief Scientist Office, Health and Social Care Directorates, United Kingdom. Dr Thomson's contribution was supported by the Department of Occupational Therapy, Human Nutrition, and Dietetics at the Glasgow Caledonian University.

Disclosures

Dr Hazelton: funding for this project was received from the National Institute for Health Research (NIHR) plus a personal fellowship from the Stroke Association. Dr Todhunter-Brown: funding to support this role is provided by the Scottish Government Chief Scientist Office; contribution to this review was funded by a grant from the NIHR. Dr Campbell: time on this review was covered by a project grant from the NIHR. Dr Hunter: time on this review was covered by a project grant from the NIHR. Dr Nicolson reports travel support from the University of Vienna, grants from Metix Medical, employment by Metix Medical, compensation from the University of Vienna for other services, and compensation from Glasgow Caledonian University for consultant services. Dr Brady reports grant/contract funding from the Glasgow Caledonian University Studentship, NIHR Health Technology Assessment Programme and the Stroke Association, and employment from the Chief Scientist Office. The other authors report no conflicts.

REFERENCES

1. Hazelton C, Thomson K, Todhunter-Brown A, Campbell P, Chung CSY, Dorris L, Gillespie DC, Hunter SM, McGill K, Nicolson DJ, et al. Interventions for perceptual disorders following stroke. *Cochrane Database Syst Rev.* 2022;11:CD007039. doi: 10.1002/14651858.CD007039.pub3 https://www.ahajournals.org/journal/str