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Non invasive brain stimulation for improving post stroke dysphagia.

Swallowing difficulties after stroke are common and carry the potential of serious complications such as pneumonia and malnutrition. Restoration of normal swallowing can help improve outcomes including mortality and institutionalisation. However, treatments for dysphagia are currently lacking management usually revolves around providing nutritional support.

This single centre randomised control trial aimed to investigate safety and efficacy of anodal transcranial direct current stimulation (atDCS) paired with swallowing exercises to improve post stroke dysphagia in patients affected by an acute unilateral hemispheric infarction. It is thought that cortical modulation techniques would augment naturally occurring neuroplastic changes to support recovery of swallow. Forty-two subjects with moderate to severe dysphagia were randomised to low dose, high dose atDCS or sham stimulation for five consecutive days.

No primary safety outcomes (seizures, deterioration of neurological motor or swallowing function) were observed in any patients showing atDCS application to be safe. In terms of efficacy no change was observed in the primary efficacy outcome of an improvement in the Penetration and Aspiration scale (PAS) scores at day 5 and dietary improvement at one month assessed by the Functional Oral Intake Score (FOIS). Despite not decreasing the risk of aspiration events in the early phase the post hoc analysis of FOIS scores at 30 days demonstrated higher clinically meaningful dietary improvement in the combined atDCS group compared to the sham (22/24 versus 8/14 subjects, $p=0.037$).

The improved dietary intake is potentially promising and merits further investigation. This study was underpowered which may have affected the results. The study showed safety and feasibility, with no patient withdrawing consent or stopping stimulation due to discomfort which is vital if we are to continue investigating treatments to improve dysphagia.

Kumar, S., Marchina, S., Langmore, S., Massaro, J., Palmisano, J., Wang, N., Searls, D. E., Lioutas, V., Pisegna, J., Wagner, C., Shinde, A., & Schlaug, G. (2022). Fostering eating after stroke (FEAST) trial for improving post-stroke dysphagia with non-invasive brain stimulation. *Scientific reports*, 12(1), 9607. <https://doi.org/10.1038/s41598-022-14390-9>

Care bundle for blood pressure reduction in acute cerebral haemorrhage

INTERACT3 is the third Intensive Care Bundle with Blood Pressure Reduction in Acute Cerebral Haemorrhage Trial. It was an international step wedge cluster randomised control trial undertaken at 121 hospitals across nine low- and middle-income countries and one high income country. It aimed to establish whether implementing a care bundle of several promising interventions could improve outcomes for a broad range of patients with acute spontaneous intracerebral haemorrhage. It incorporated protocols for intensive blood pressure reduction (<140mmHg) and management of hyperglycemia (6.1-7.8 mmol/L without diabetes, 7.8-10.0mmol/L with diabetes), pyrexia ($\leq 37.5^{\circ}\text{C}$), and abnormal anticoagulation in those taking warfarin (INR<1.5 with 1 hour).

The primary outcome was functional recovery measured at six months according to the modified Rankin scale (mRS) looking for shift across all categories. All analysis were undertaken at the patient level with adjustment for clustering on a modified intention to treat basis, regardless of protocol adherence.

Overall, 3221 patients with ICH were assigned to the care bundle group and 3815 to the usual care group. Although recruitment was affected due to COVID-19 and other issues this pragmatic trial showed that in patients presenting within six hours with the onset of acute intracerebral haemorrhage the use of the care bundle protocol compared with usual care significantly improved the likelihood of functional recovery, reduced mortality, improved health-related quality of life, and reduced time in hospital. This is the first clinical trial to show a significant beneficial effect on a primary outcome of functional recovery in patients with ICH and these benefits were consistent across all types of patients, even those with severe ICH or who require neurosurgery intervention.

Interestingly, the separate components of the Care Bundle produced relatively small changes in physiological variables so what's the peers key to the effectiveness is the whole Care Bundle, where the interventions have synergistic effects within themselves but are also likely to produce flow-on effects in the management of patients. These effects that are not easy to measure constitute nursing practise across a lot of areas. A mediation analysis is planned to identify the effects of various components of the care bundle and other key aspects of stroke care on outcomes of the active multifaceted management utilised in this trial.

The third Intensive Care Bundle with Blood Pressure Reduction in Acute Cerebral Haemorrhage Trial (INTERACT3): an international, stepped wedge cluster randomised controlled trial, [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(23\)00806-1/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(23)00806-1/fulltext)

Effects of multicomponent exercise on quality of life, depression and anxiety among stroke survivors

This systematic review and meta-analysis aimed to synthesise all available data from published randomised controlled trials to evaluate the effectiveness of multicomponent exercise on quality of life (QoL), depression and anxiety in patients after a stroke.

There were only nine papers identified that met the inclusion criteria for the review with only one low risk for bias. All nine included data on QoL, four depression, and two anxiety. The results of the meta analysis on seven of the included studies indicated that multicomponent exercise with a relatively longer session time (>60mins) was associated with better QoL immediately post intervention and at medium term follow up (3-6 months post intervention) but not in the longer term (> 6 months post intervention). No significant effect upon depression or anxiety was identified within the studies included.

It is worth noting that was in some of the included studies that participants in both intervention and control groups reported a similarly high level of physical activity after hospital discharge which could account for the ambivalent results. Although this review does not add much to previous Cochrane reviews in this area it does add to the call for larger well-designed studies in order to provide the evidence of optimal exercise training prescription on QoL depression, and anxiety. Future studies should include comparison of multicomponent exercise with single component exercise programmes alongside the styles, forms, and doses needed.

The authors suggest that healthcare providers could consider encouraging patients to participate multicomponent exercise sessions for more than 60 minutes however they note that is important that stroke survivors should be supervised by trained personnel at the beginning of the training.

Song, Y.-Y., Sun, W.-J., Wang, C., Tian, Y.-M., Liu, H., & Jiang, Y. (2023). Effects of multicomponent exercise on quality of life, depression and anxiety among stroke survivors: A systematic review and meta-analysis. *Journal of Clinical Nursing*, 00, 1–14. <https://doi.org/10.1111/jocn.16853>

Adaptation and content validation of a patient reported measure of treatment burden for use in stroke survivors

Stroke is a life altering condition and stroke survivors can live with a range of unmet needs and can face cognitive decline. Stroke survivors and their carers often live with significant treatment burden such a strict adherence to medications, appointment attendance, maintenance of physical mobility through recommended exercise, and monitoring of dietary intake. Treatment burden is likely to be associated with reduced adherence to treatments and poor health related outcomes such as mortality, however due to a lack a validated tools to measure this has not been examined.

This study aimed to adapt a patient reported measure of treatment burden the Patient Experience with Treatment and Self-management (PETS) to create a stroke specific measure (PETS-stroke) and to conduct content validity testing with stroke survivors. Existing general measures do not represent specific aspects of treatment burden reported by stroke survivors such as making adaptations to the house, obtaining walking aids, and return to work and driving.

Members of the research team compared the 60 items in PETS to their previously developed taxonomy and conceptual model of treatment burden in stroke. Items were deleted if not relevant and new items were added if a burden was noted in the taxonomy but not the PETS. Where reasonable items were merged to reduce the overall number in the questionnaire to 34 items and wording was amended where required.

Content validation of PETS-stroke was then assessed through cognitive interviews with 15 stroke survivors. The content of each item was collaboratively read and the participants established if the items were fit for purpose. Changes were made based on feedback and three rounds of interview and revision continued until the research team were satisfied that no further revision would be required.

Discussion centred around importance, relevance, recall period and time since stroke, and clarity. Changes were made to several items to improve understanding, but no items were removed. The findings suggest that the measures are best suited to measuring treatment burden in the first year after stroke

PETS-stroke is relevant meaningful and comprehensible stroke survivors. Further testing is needed to examine construct validity, reliability, and usability however this measure will be useful in future randomised control trials to measure treatment burden and to identify stroke patients who are at high risk of suffering it. The authors acknowledge that future research is also needed to examine how best to lessen treatment burden in the longer term after stroke.

Wood K, Sardar A, Eton DT, et al. Adaptation and content validation of a patient-reported measure of treatment burden for use in stroke survivors: the patient experience with treatment and self-management in stroke (PETS-stroke) measure. *Disability and Rehabilitation*. 2023 Aug;1-10. DOI: 10.1080/09638288.2023.2241360. PMID: 37545161.