

Does Nutritional Therapy Reduce Disability and Improve Activities of Daily Living After a Stroke? – A Cochrane Review Summary with Commentary

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Abstract

Background: Malnutrition can severely impact post-stroke functional recovery, but the effects of nutritional therapy (NT) on disability and activities of daily living (ADL) after stroke are not thoroughly investigated.

Objectives: the aim of the Cochrane Review by Sakai et al. (2023) was to evaluate the effectiveness of NT in reducing disability and improving ADL after stroke. The aim of this Corner is to provide a summary of Sakai et al. with comments from a rehabilitation perspective.

Methods: randomised controlled trials (RCTs) enrolling persons with stroke, investigating NT (defined as the administration of supplemental nutrients), compared with placebo, usual care (UC), or another type of NT were searched. Disability (modified Rankin score-mRS) and activities of daily living (ADL) were the primary outcomes.

Results: The review included 52 trials (11,926 participants) with most studies conducted in the acute phase (36) and 25 types of supplements used. There was no difference in disability nor all-cause mortality, but oral energy and protein supplements may improve ADL. There was a higher risk of diarrhoea, hyper- and hypoglycemia in participants receiving NT.

Conclusions: The effects of NT on disability and ADL after stroke is still uncertain, while NT may associate to increased adverse events. Future research should focus on targeted nutritional interventions to improve function after stroke, based on a theoretical rationale.

Keywords

nutritional therapy, stroke, disability, activities of daily living, systematic review

The aim of this commentary is to discuss from a rehabilitation perspective the Cochrane Review “Nutritional therapy for reducing disability and improving activities of daily living in people after stroke” (Sakai et al., 2024) by Sakai K, Niimi M, Momosaki R, Hoshino E, Yoneoka D, Nakayama E, Masuoka K, Maeda T, Takahashi N, Sakata N¹, published by Cochrane Central Editorial Service Group. This Cochrane Corner is produced in agreement with NeuroRehabilitation by Cochrane Rehabilitation with views* of the review summary author in the “implications for practice” section.

Background

Stroke is the third common cause of Neurological disorders, which bear the third-highest need for rehabilitation in patients ≥65 years, a rapidly growing segment of the population. Dysphagia, perception deficits, cognitive dysfunction, and reduced consciousness after stroke are associated with higher risk of malnutrition, which is reported in about 60% stroke patients, associating with sarcopenia, and predicting

disability and mortality. Malnutrition generally refers to insufficient protein-energy intake; vitamins, minerals, and other essential nutrients are also important. Current guidelines on stroke management recommend nutritional supplements for patients who are malnourished or at risk of malnutrition, but not their routine use, mainly based on the negative findings of one large RCT published in 2005 (Dennis et al., 2005). A comprehensive review was needed to ascertain the role of nutritional therapy (NT) in stroke management strategies. Furthermore, the recommendations on type of nutrients and their effects are not clearly defined.

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Nutritional therapy for reducing disability and improving activities of daily living in people after stroke

(Sakai K, Niimi M, Momosaki R, Hoshino E, Yoneoka D, Nakayama E, Masuoka K, Maeda T, Takahashi N, Sakata N, 2024)

Objective: The aim of this Cochrane review was to evaluate the effects of nutritional therapy on disability and ADL in stroke patients.

What was studied and methods: The population included patients with stroke, regardless of the cause and the time from the event; mixed etiologies (eg stroke and traumatic brain injury) were excluded. The intervention studied was NT, administered orally and/or enterally via a tube or stoma, using additional energy, protein, fatty acids, amino acids, vitamins, and/or minerals. The intervention was compared to placebo, usual care (UC), or NT different from the intervention. Primary outcomes were disability and activities of daily living (ADL); secondary outcomes included gait; nutritional status; death; incidence of complications; quality of life; muscle strength; cognitive function; physical performance; stroke recurrence; neurological impairment; swallowing function. The authors searched for individual or cluster RCTs and crossover trials in multiple databases (Cochrane Stroke Group's Trials Register, MEDLINE, CENTRAL, Embase, CINAHL EBSO and AMED) up to February 2024.

Results The review included 52 studies with 11,926 participants; 36 were carried out in acute, 10 in subacute, three in both, and three in chronic phase; Comparators were UC (33), placebo (11), another nutrient/nutrient dose (8). Most studies had issues regarding risk of bias, especially absence of blinding and unclear information. Out of the 55 studies, 37 studies were used in meta-analysis. The review shows that:

- No difference in reducing disability (for 'good status'-mRS 0-2: OR 0.97, 95% CI 0.86 to 1.10; 1 RCT, 4023 participants; low-certainty evidence).
- Oral energy and protein supplements (OEPS) may improve ADL, measured by Motor Functional Independence Measure (M-FIM) (MD 8.74, 95% CI 5.93 to 11.54; 2 RCTs, 165 participants; very low-certainty evidence)
- OEPS may increase body weight (MD 0.90, 95% CI 0.23 to 1.58; 3 RCTs, 205 participants; very low-certainty evidence).
- No difference in all-cause mortality (OR 0.57, 95% CI 0.14 to 2.28; 2 RCTs, 4065 participants; low-certainty evidence).
- No study on gait speed and quality of life.
- No difference in the incidence of infections (OR 0.68, 95% CI 0.20 to 2.30; 1 RCT, 42 participants; very low-certainty evidence).

- Increased incidence of diarrhoea (OR 4.29, 95% CI 1.98 to 9.28; 1 RCT, 4023 participants; low-certainty evidence), hyperglycaemia or hypoglycaemia (OR 15.6, 95% CI 4.84 to 50.23; 1 RCT, 4023 participants) vs UC (low-certainty evidence).

Conclusions: The authors concluded that the effect of NT on reducing disability and improving ADL after stroke is still uncertain. Meta-analyses were limited by the heterogeneity of nutritional supplements and of outcomes investigated, and most studies presented risk of bias. NT was associated to higher incidence of adverse events by low-certainty evidence. They recommended that further research should focus on targeted nutritional interventions to improve function, based on a theoretical rationale.

Implications for practice in neurorehabilitation: In 2005, Dennis et al. (Dennis et al., 2005) published the results of the FOOD trials regarding the effect on disability (mRS) and mortality of oral nutritional supplements after stroke (4023 patients; 125 hospitals; 15 countries), concluding "...On the basis of our results...it seems likely that patients who are judged to be undernourished on admission or who have deteriorating nutritional status in hospital will be offered oral nutritional supplements. However, our data do not support use of routine supplementation of hospital diet for unselected stroke patients who are mainly well nourished on admission." Based on this study, most current stroke management guidelines do not recommend the routine use of nutritional supplements, while NT is recommended for patients at risk of malnutrition or malnourished. The results of this review do not seem to justify any changes to current practice. Indeed, even the very low-certainty evidence of OEPS associating with improvements in ADL by change in M-FIM should be taken with caution, since measures of ADL (such as M-FIM) and categorical disability measures (such as mRS) are both commonly used to quantify disability in stroke patients, and are highly correlated (Kwon et al., 2004), raising an issue on the authors' choice of investigating disability and ADL separately. It is not surprising that NT works only when nutritional status is (at risk of being) compromised, whereas, from the perspective of clinical practice, more research seems needed to understand how to personalize and optimize this intervention, when appropriate.

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Notes

1. This summary is based on a Cochrane Review previously published in the Cochrane Database of Systematic Reviews 2024, Issue 8. Art. No.: CD014852. DOI: 10.1002/14651858.CD014852.pub2 (see www.cochranelibrary.com for information). Cochrane Reviews are regularly updated as new evidence emerges and in response to feedback, and Cochrane Database of Systematic Reviews should be consulted for the most recent version of the review.

* The views expressed in the summary with commentary are those of the Cochrane Corner author (different than the original

Cochrane Review authors) and do not represent the Cochrane Library or Wiley.

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