

The effects of perioperative carbohydrate supplementation on length of hospital stay and postoperative complications in older adult hip fracture patients: a systematic review and meta-analysis

H. Lloyd¹, D. King², N. Burn³, V. Zohoori¹ and S. J Allison¹

¹School of Health & Life Sciences, Teesside University, Middlesbrough, UK,

²Department of Nutritional Sciences, University of Surrey, Guildford, UK and

³UniSA Online University of South Australia, Adelaide, SA, Australia

Carbohydrate loading before surgery can be an effective and simple approach to reduce the stress response and hospital length of stay (LOS) in elective surgery patients ^{(1),(2)}. However, the effects of carbohydrate loading on LOS in the setting of hip fracture surgery is less clear. The aim of this systematic review and meta-analysis was to explore the effects of perioperative carbohydrate supplementation on hospital LOS in older adult hip fracture patients. Secondary outcomes were postoperative complications.

A systematic search of CINAHL, EBSCO, AMED, MEDLINE, EMBASE, Clinical Trials registries and Cochrane databases was performed from inception through to June 2022. Randomised controlled trials investigating the effects of carbohydrate supplementation (with or without other macro/micronutrients), compared to a placebo or standard hospital diet, during the perioperative phase of care for older adult hip fracture patients were included. Data were pooled as raw mean differences (MD) and analysed using random and fixed effects models where appropriate. Between-study heterogeneity was indicated by tau (tau²).

Nine studies met the inclusion criteria from 4402 articles. The supplementation prescription varied, with no one study delivering an individual carbohydrate load. Exclusion criteria was similar across studies, and patients typically at risk of a longer LOS and comorbidity were excluded. There were no significant differences between the supplemented and control groups in relation to length of hospital stay (MD 0.12, 95% CI [-1.01 to 1.26], P = 0.83). Between-study heterogeneity (tau²) was ± 0.39 days. Supplemented groups fared better in relation to infection (OR 0.43, 95% [0.22 to 0.85], P = 0.01), but there were no differences between groups for pressure ulcers (OR 0.33, 95% CI [0.10 to 1.08], P = 0.07) and mortality (OR 1.53, 95% CI [0.46 to 5.14], P = 0.49).

Studies included in this review used an oral multinutrient supplement intervention consisting of carbohydrate and protein, but not carbohydrate-only. Our meta-analysis did indicate that oral multinutrient supplementation containing carbohydrate and protein may reduce risk of infection in hip fracture patients. However, the number of trials included in this review were limited and most were of poor methodological quality owing to the lack of blinding and small sample sizes. Patients at a higher risk of malnutrition and with comorbidity were also excluded and collectively this may explain the lack of intervention effect observed for LOS. More research is needed to specifically examine the effect of carbohydrate loading on clinical and metabolic outcomes in older adult patients with hip fracture who are a population at risk of malnutrition.

References

1. Scott, MJ & Fawcett WJ (2014) *Anaesthesia* 1308–1313.
2. Bilku DK, Dennison AR, Hall TC *et al.* (2014) *Ann R Coll Surg Eng* 15–22.