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Does Leucine Supplementation Impact Post-Stroke Sarcopenia?: A Critical Review of the Literature

Topic: Integrative Medicine

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BACKGROUND

The criteria to diagnose sarcopenia include loss of skeletal muscle mass (SKM), strength, and impaired physical motor performance. Post-stroke sarcopenia presents unique challenges distinct from age-related sarcopenia, primarily driven by physical inactivity due to hemiparesis, leading to significant muscle wasting in the acute phase. The prevalence of post-stroke sarcopenia ranges from 16.8% to 60.3%, with higher rates observed shortly after the stroke, averaging about 50% at one-month post-stroke. Nutritional interventions, particularly increased protein intake and higher leucine (LEU) levels, have shown promise in synergizing with progressive resistance exercise (PRE) to combat sarcopenia.

This review evaluates the literature on the role of a LEU-enriched diet during inpatient rehabilitation and its potential impact on muscle weakness and functional impairment after stroke.

METHODS

A search for "the effects of LEU/branched-chain amino acids (BCAA) on muscle weakness" in reputable medical databases yielded 585 articles. This was narrowed to four randomized clinical trials (RCTs) published after 2015, involving LEU/BCAA intervention on stroke, brain injuries, or neuro-related weakness and sarcopenia. Two articles were excluded due to one involving spastic cerebral palsy patients as primary population and the other including all essential amino acids as intervention.

RESULTS

The reviewed articles suggest that incorporating at least 3 g of 40% LEU into the diets of patients with sarcopenia secondary to stroke, along with PRE, is a safe and simple approach to promote SKM, strength, and physical function. Additionally, morning supplementation before therapies offers additional benefits, challenging the previous standard of post-exercise intake.

CONCLUSION

While LEU appears to be a low-risk, high-reward adjunct to preserve or improve SKM, strength, and physical function, there is a need for more inclusive, multi-center RCTs to confirm the early observation of positive effects of LEU in post-stroke sarcopenia and other neuromuscular-related weaknesses.

Statement of Disclosures

None

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