

Efficacy of a disease-specific nutritional support for pressure ulcer healing: A systematic review and meta-analysis

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Introduction

International guidelines acknowledge the role of nutritional support in the management of pressure ulcer (PU) patients^{1,2}. Specific recommendations on energy and protein requirements are included in these guidelines, and the role of supplementation with specific nutrients (arginine, zinc and antioxidants) using disease specific formulae are highlighted. However, since the development of these guidelines further evidence of the role of disease specific formulae has been published. The purpose of this systematic review and meta-analysis is to better evaluate current evidence of the role of disease-specific formulae in the healing of PUs using a high grade evidence methodology.

Method

Randomised controlled trials (RCTs) published from January 1997-October 2015 were searched for in electronic databases. Only RCTs that met the following criteria were included in the review:

- 1) RCTs which assessed the efficacy of a high-calorie disease-specific formula compared to a control intervention (alternative nutritional formulation, or non-caloric placebo)
- 2) RCTs of 4 weeks duration or longer

The primary outcome assessed was the percentage of change in PU area at 8 weeks. Secondary outcome measures included: a reduction in the area of 40% or greater, and complete healing at 8 weeks.

Results

Three trials were included in the final analysis³⁻⁵. The trials included a total of 273 participants (disease-specific N=138, control N=135) who were aged >70 years, and had PU stage II, III or IV. Two of the trials included patients with a diagnosis of malnutrition^{3,5}, while one trial included subjects who were defined as non-malnourished⁴. In all studies a disease-specific nutritional formula enriched with arginine, zinc and antioxidants from the same industry was used (Cubitan[®], Cubison[®], Nutricia Advanced Medical Nutrition).

Meta-analysis demonstrated that, compared with control interventions, use of a disease specific formulae enriched with arginine, zinc and antioxidants resulted in a significantly greater reduction in PU area (mean difference of -15.7% [95%CI -29.9, -1.5] P=0.030) and a significantly higher proportion of subjects having a 40% or greater reduction in PU size at 8 weeks (OR=1.72 [95%CI 1.04, 2.84] P=0.033).

Conclusion

This systematic review and meta-analysis demonstrates that the use of formulae enriched with arginine, zinc and antioxidants as oral nutritional supplements and tube feeds for at least 8 weeks are associated with improved PU healing compared with standard formulae (moderate protein and high protein), and a non-caloric placebo. Authors state that the results support Grade A evidence of the use of a disease specific formula enriched with arginine, zinc and antioxidants in the nutritional support of PU patients, and that it strengthens recommendations in the NPUAP-EPUAP and PPIA international guidelines ^{1,2}.

The present review has shown that nutritional support should be at least 8 weeks long.

The synergistic role of specific nutrients in wound healing

“Arginine is a semi-essential amino acid contributing to protein anabolism (e.g. collagen synthesis), cellular growth. As a donor of nitric oxide, it can also increase tissue blood flow, improve immune response and induce the mobilization of endothelial progenitor cells from the bone marrow. Zinc is an important co-enzyme of enzymes involved in protein and DNA synthesis, immune function, and cellular proliferation. Antioxidants are also relevant in any chronic inflammatory condition. Particularly, Vitamin C plays a role in cellular immunity, fibroblast proliferation and the synthesis of collagen. Previous trials were not able to demonstrate a positive effect for these single micronutrients and the failure was likely due to the lack of concomitant energy supply”

References:

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