

Abstract

Effect of a Tailored Dietary Intervention with High or Standard Protein Intake on B-Vitamin and One Carbon Metabolism Status in Healthy Older Males: A 10 Week Randomised Controlled Trial †

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Background: Maintaining optimal status of folate and metabolically related vitamins (riboflavin and vitamins B₆ and B₁₂) is increasingly important for older adults. These nutrients are crucial for the complex regulation of metabolites involved in one carbon metabolism (OCM) that have been implicated in common diseases of ageing. Higher protein diets are increasingly recommended for the elderly to preserve mobility and good health. However, we do not know what effect consuming a higher protein diet compared to current recommendations, alongside other associated changes in dietary pattern will have on B-vitamin and OCM status in older adults.

Methods: In this study, 30 healthy elderly men (74 ± 4 years) were randomized into two groups fed weight-maintaining, tailored diets containing either the recommended daily allowance (RDA), or twice the recommendations of protein (2RDA) for ten weeks. Fasting blood samples were collected prior and post dietary intervention. Absolute plasma concentrations of folate and related vitamins, as well as semi-quantitative polar metabolites including homocysteine (Hcy) were analysed by liquid chromatography mass spectrometry (LC-MS).

Results: Plasma riboflavin concentrations were significantly increased with 2RDA ($p = 0.005$), though no other vitamin concentrations were changed, nor Hcy from our non-targeted analysis.

Conclusion: Hcy and additional one carbon metabolites are currently being analysed by a targeted quantitative analysis using LC-MS to determine the impacts of this dietary intervention on downstream metabolic pathways. This will not only give us a more accurate measure of Hcy, but will

also allow us to identify more intricate changes to the complex regulation of OCM with a controlled high protein diet.



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