Proceedings of the Nutrition Society (2009), **68 (OCE1)**, E9 doi:10.1017/S0029665109001505

OCE Malnutrition Matters, Joint BAPEN and Nutrition Society Meeting, 4–5 November 2008, Harrogate

Analysis of micronutrient intakes from 24 h diet recalls in malnourished community-based elderly patients and comparison with the National Diet and Nutrition Survey (NDNS) and reference nutrient intake (RNI) levels

G. P. Hubbard[1], A. Holdoway[2] and R. Bolch[1]

[1]*Medical Affairs, Nutricia, Whitehorse Business Park, Trowbridge, Wiltshire BA14 0XQ, UK and* [2]*Nutrition and Dietetics, Wiltshire PCT, Devizes, Wiltshire SN10 5EQ, UK*

Disease-related malnutrition is common in the elderly and if left untreated may have severe consequences[1]. The management of malnutrition often concentrates on the provision of energy, while micronutrient status and intake is often overlooked. Little research exists comparing the micronutrient intakes of those at risk of undernutrition with their nutritional status and with that of the average population.

As part of a larger study, 24 h diet recalls were recorded from seventy-four community-based elderly patients (mean age 83 (SD 7) years; thirty-one males, forty-three females; mean BMI 20.8 (SD 3.8) kg/m^2), identified as being at medium (malnutrition universal screening tool (MUST) score 1; *n* 52) or high (MUST score ≥ 2; *n* 22) risk of malnutrition[2]. The 24 h diet recalls were analysed using Weighed Intake Analysis Software Package v3.0 for Windows (Tinuviel Software, Llanfechell, Anglesey, UK) to determine intake of energy and micronutrients. These data were correlated (Pearson's correlation) with MUST score, weight, BMI and age and compared by MUST score with data from NDNS, a national survey of 4 d weighed dietary intakes in elderly free-living individuals aged ≥ 65 years[3]. Statistical analysis was carried out in SPSS for Windows v15 (SPSS Inc, Chicago, IL, USA). The z score for comparison of means was also calculated.

Mean total daily energy intake was significantly lower (1088 kJ (260 kcal)) in malnourished patients (MUST score of ≥ 1) compared with that recorded in the NDNS for the average elderly population (5724 (SD 2144) kJ (1368 (SD 513) kcal) *v.* 6812 (SD 1941) kJ (1628 (SD 464) kcal)); z score $P>0.004$). The mean total daily intake for a range of micronutrient intakes were significantly below the NDNS ($P>0.004$) and the RNI (≥ 50 years)[4] for patients at risk of malnutrition including Mg, Fe, Zn, Se, I, vitamin A and folate. The mean total daily intake for a range of micronutrient intakes was below the NDNS for patients with a medium risk of malnutrition and decreased further in patients with a high risk of malnutrition, including intakes of Mg, phosphate, Fe, Cu, Zn, Mn, vitamin A, vitamin E, niacin and vitamin B_6 (see Table). Cu and Mn were significantly lower in the high-risk group compared with the medium-risk group ($P \geq 0.05$; independent samples *t* test). No significant correlations were observed for the intake of energy or micronutrients compared with MUST score, weight, BMI or age (Pearson's correlation).

	All (*n* 74)		Medium risk (*n* 52)		High risk (*n* 22)		NDNS (*n* 1275)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Energy (kJ)	5724	2144	5766	2012	5632	2485	6812	1941
Mg (mg)	176	55	180	52	167	61	221	75
Fe (mg)	7.2	3.3	7.5	3.4	6.6	2.9	10.0	5.4
Cu (mg)	0.9	1.1	1.0	1.3	0.6	0.2	1.0	0.6
Zn (mg)	6.8	3.1	6.9	3.1	6.6	3.1	7.8	2.8
Mn (mg)	2.2	0.7	2.3	0.8	2.0	0.5	2.9	1.3
Vitamin A (μg; RE)	383	1174	439	1395	253	199	1153	1568
Vitamin E (mg; α-TE)	7.6	4.1	7.8	4.4	7.0	3.5	10.3	23.5
Niacin (mg; NE)	12.5	6.6	12.8	6.8	11.8	6.3	28.9	10.7
Folate (μg)	171	83	170	78	173	94	245	112
Vitamin B_6 (mg)	1.3	0.7	1.4	0.6	1.3	0.7	2.1	3.2

RE, retinol equivalent; α-TE, α-tocopherol equivalent; NE, niacin equivalent.

This observational research has investigated the intakes of energy and micronutrient intakes in patients identified as medium or high risk of malnutrition according to MUST. As might be expected, energy intakes for malnourished patients were below that of the NDNS and the intakes of a number of micronutrients were considerably below the NDNS and RNI. These micronutrient intakes decreased further in those at high risk of malnutrition. Although there are limitations to this comparison due to the differing methods of dietary assessment, the method used in the present study (24 h diet recalls) has been used consistently in both clinical practice and research as a reliable and valid method of dietary assessment[5]. These observations draw further attention to the issue of micronutrient deficiencies that can occur in elderly undernourished individuals, which should be addressed when considering strategies for the management of undernutrition in clinical practice.

1. Stratton RJ, Green CJ & Elia M (2003) *Disease-related Malnutrition: An Evidence-based Approach*. Oxford, Oxon.: CABI Publishing.
2. Elia M (editor) (2003) *The 'MUST' Report. Nutritional Screening for Adults: A Multidisciplinary Responsibility*. Redditch, Worcs.: BAPEN.
3. Finch S, Doyle W, Lowe C *et al.* (1998) *National Diet and Nutrition Survey: People Aged 65 Years and Over*. vol. 1: *Report of the Diet and Nutrition Survey*. London: The Stationery Office.
4. Department of Health (1991) *Dietary Reference Values for Food Energy and Nutrients for the United Kingdom*. London: Department of Health.
5. Gibson RS (2005) *Principles of Nutritional Assessment*, 2nd ed. Oxford: Oxford University Press.