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Micronutrient intake in overweight adults with spinal cord injury: analysis before and after dietetic intervention

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There is currently limited evidence reporting the nutritional status of patients with spinal cord injury (SCI)^(1,2). This study aims (i) to describe micronutrient intake with reference to the UK Lower Reference Nutrient Intake (LRNI)⁽³⁾ and the national survey data⁴ and (ii) to compare the micronutrient intake of overweight SCI adults, before and after dietetic intervention. Thirty-two SCI patients' (52.4 ± 11.5 years; BMI: 32.9 ± 4.7 kg/m²; 41 % female) 7-day food diaries were analysed at baseline and follow-up. The average weight loss was 3.7% after dietetic intervention. A significant reduction was found for zinc ($p = 0.005$) and folate ($p = 0.05$) intake in women and riboflavin ($p = 0.05$) in men after intervention. Male and female participants failed to meet the LRNI for selenium before intervention, and females failed to meet the LRNI for potassium and selenium after intervention. In addition, our data show disparity when compared to findings of the national survey. Individuals are likely to have reduced physical activity and become institutionalised after SCI. Currently there is no generally recommended vitamin D intake for individuals less than 65 years old. Of participants aged 65 or above, 80% and 100% did not meet the LRNI for Vitamin D at initial assessment and follow-up respectively. The low vitamin D intake may be associated with an increased risk of complication such as osteoporosis. This study reveals possible micronutrient deficiencies in relation to the UK standards despite participants' diets containing excess energy, suggesting that their diets contain nutritionally poor quality food. With the exception of Zn, folate and riboflavin, there was no significant difference in micronutrient intake following dietetic intervention, suggesting that the quality of the diet was, in general, improved without severely compromising the micronutrient profile. When working with overweight SCI patients, clinicians must be aware of pre-existing dietary inadequacies of micronutrients and facilitate improvements in the quality of the diet as well as reducing energy intake. Further research on nutrient intake in this group of vulnerable patients is warranted.

Nutrient Group	SCI Group (mean)				NDNS ³		LRNI ⁴	
	Men		Women		Men	Women	Men	Women
	Initial	Follow-up	Initial	Follow-up				
Calcium (mg/d)	951.3	783.5	573.2	565.5	1007	777	400	400
Phosphorus (mg/d)	1710.8	1282.3	979.6	898.1	1493	1112		
Magnesium (mg/d)	366.2	270.5	203.5	194.9	308	229	190	150
Sodium (mg/d)	2783.5	2371.5	1990.1	1636.3	3313	2302	575	575
Potassium (mg/d)	3152.3	2751.7	2264.5	1975	3367	2635	2000	2000
Chloride (mg/d)	4125.7	3535.4	2999.5	2514	–	–	–	–
Iron (mg/d)	12.6	10.9	9.0	7.6	13.2	10	4.7	8.0 ^a /4.7 ^b
Zinc (mg/d)	11.8	8.6	7.1 [†]	5.8 [†]	10.2	7.4	5.5	4
Copper (mg/d)	3.1	1.3	0.9	0.9	1.43	1.03		
Selenium (mg/d)	36.7	43.2	34.2	35.1	–	–	40	40
Iodine (µg/d)	234.2	126.1	117.1	93.7	215	159	70	70
Thiamin (mg/d)	1.6	1.7	1.3	1.1	2	1.54	0.23	0.23
Riboflavin (mg/d)	2.3*	1.8*	1.2	1.1	2.11	1.66	0.8	0.8
Nicotinic acid (mg/d)	36.3	32.8	28.1	25	44.7	30.9	4.4	4.4
Vitamin B6 (mg/d)	2.1	2	1.6	1.3	2.9	2	1	1
Vitamin B12 (mg/d)	6.4	5.2	3.7	3.2	6.5	4.8	1	1
Folate (µg/d)	353.3	279.9	211.8*	179.9*	344	251	100	100
Vitamin C (mg/d)	78.1	87.2	87.5	64.6	83.4	81	10	10
Vitamin A (µg/d)	1114.5	634.7	817.6	821.3	911	671	300	250
Vitamin D (µg/d)	3.1	3.5	3	2.3	3.7	2.8	–	–
Vitamin E (mg/d)	7.6	6.1	5.9	5.6	10.6	8.1		

SCI: Spinal Cord Injury; NDNS: National Dietary and Nutrition Survey; RNI: Reference Nutrient Intake; LRNI: Lower Reference Nutrient Intake; d: day; * $P < 0.05$; † $P < 0.01$; ^aaged 19–20; ^baged 50+.

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