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**The relationship between weight loss and texture-modified diets in patients with Alzheimer's disease in Japan**

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**Objectives:** To determine the prevalence of weight loss in patients with Alzheimer's disease (AD) with normal or Texture-Modified Diets (TMD), and to assess the energy and protein intake required to prevent weight loss.

**Methods:** We included 75 Japanese long-term care hospital patients with probable AD in an interventional study. Patients with weight loss  $\geq 7.5\%$  over 3 months were at high risk of malnutrition.

**Results:** Thirty seven (49.3%) patients were already malnourished (BMI  $< 18.5$  kg/m<sup>2</sup>) and 16 (21.3%) had  $\geq 7.5\%$  weight loss, with an energy intake at cutoff of 29.088 kcal/kg and a protein intake at cutoff of 1.129 g/kg. The food consumption rate showed a significant increasing trend with greater texture modification (P<sub>trend</sub> = .038). Odds ratios of weight loss were lower for TMD than for normal food.

**Conclusion:** A mismatch in food type may cause weight loss. Multicentered research using larger sample sizes is necessary to investigate causality.

	Total (n = 75)	Food type				P-value	
		Normal (n = 7)	Soft foods (n = 14)	Porridge and side dishes (n = 30)	Liquidized food (n = 21)		Jellied food (n = 3)
Age (years)	83.7 ± 7.2	79.7 ± 8.2	85.8 ± 6.2	83.0 ± 6.2	85.0 ± 8.2	80.7 ± 13.7	.308
Sex, n (%)							.787
Male	22 (29.3)	1 (14.3)	5 (35.7)	10 (33.3)	5 (23.8)	1 (33.3)	
Female	53 (70.7)	6 (85.7)	9 (64.3)	20 (66.7)	16 (76.2)	2 (66.7)	
Length of disease duration, (years)	5.7 ± 3.6	5.4 ± 4.2	4.9 ± 4.1	5.8 ± 3.8	6.0 ± 2.8	7.4 ± 3.2	.178
Length of stay (months)	1.8 ± 1.6	1.2 ± 3.1	1.5 ± 1.7	1.7 ± 1.4	1.9 ± 1.5	3.7 ± 1.7	.170
Height, (cm)	149 ± 10	151 ± 11	151 ± 9	149 ± 10	149 ± 10	157 ± 7	.547
Weight, (kg)	42.6 ± 9.3	52.0 ± 11.7	47.3 ± 7.2	43.0 ± 8.2	37.1 ± 7.5	32.3 ± 4.0	<.001*
BMI (kg/m <sup>2</sup> )	19.0 ± 3.5	22.8 ± 4.0	20.8 ± 2.3	19.4 ± 3.1	17.1 ± 2.8	14.1 ± 2.5	<.001*
<18.5	37 (49.3)	1 (14.3)	2 (14.3)	15 (50.0)	16 (76.2)	3 (100.0)	.003*
18.5–25.0	36 (48.0)	5 (71.4)	11 (78.6)	15 (50.0)	5 (23.8)	—	
≥25.0	2 (2.7)	1 (14.3)	1 (7.1)	—	—	—	
Staff assisting with eating, n (%)							
Yes	27 (36.0)	2 (28.6)	1 (7.1)	11 (36.7)	12 (57.1)	3 (100.0)	<.001*
No	48 (64.0)	5 (71.4)	13 (92.9)	19 (63.3)	9 (42.9)	—	
Difficulty swallowing, n (%)							
Yes	26 (34.7)	—	1 (7.1)	10 (33.3)	12 (57.1)	3 (100.0)	.001*
No	49 (65.3)	7 (100.0)	13 (92.9)	20 (66.7)	9 (42.9)	—	

Table 1. Baseline characteristics of patients with AD according to food type

	Normal (n = 7)	Food type				P <sub>trend</sub>
		Soft foods (n = 14)	Porridge and side dishes (n = 30)	Liquidized food (n = 21)	Jelly (n = 3)	
No. of patients	3	1	9	2	1	
OR (95% CI) *	1.0 (reference)	0.11 (0.01–1.33)	0.58 (0.10–3.42)	0.15 (0.18–1.33)	0.33 (0.19–0.81)	
OR (95% CI) †	1.0 (reference)	0.04 (0.01–0.98) *	0.32 (0.04–2.99)	0.05 (0.03–0.99) *	0.15 (0.02–0.61)	
Energy intake (kcal/kg/day)						
≥30 kcal/kg/day (n = 23)	—	—	6	—	—	
<30 kcal/kg/day (n = 17)	—	—	—	—	—	
No. of patients	10	6	—	—	—	
OR (95% CI) *	1.0 (reference)	4.63 (1.40–15.37) *	—	—	—	
OR (95% CI) †	1.0 (reference)	6.62 (1.55–28.34) *	—	—	—	
Protein intake (g/kg/day)						
≥1.2 g/kg/day (n = 35)	—	—	—	—	—	
<1.2 g/kg/day (n = 25)	—	—	—	—	—	
No. of subjects	4	12	—	—	—	
OR (95% CI) *	1.0 (reference)	4.33 (1.21–15.51)	—	—	—	
OR (95% CI) †	1.0 (reference)	5.21 (1.20–22.63) *	—	—	—	

Table 1. Odds ratios and 95% confidence intervals for the prevalence of malnutrition according to food type, energy intake, and protein intake per actual body weight

**Biography**

Tomiyo Nakamura has her expertise in preventing dementia, cancer, and cardiovascular diseases. She was born and raised at Osaka in Japan, and received her Bachelor's degree from the Osaka City University in 1979. After graduating from the university, she worked as a registered dietitian at Public Health Center in Osaka. From 1992 she was engaged as a leader of registered dietitians, in clinical trials targeting cancer at the Osaka medical center for cancer and cardiovascular diseases, and began to study the relationship between cancer, cardiovascular diseases and nutrition. She obtained her Ph.D. degree from the Osaka University Graduate School of Medicine in 2010. In 2015 she was appointed Professor of Food Science and Human Nutrition, Ryukoku University. Now, she is investigating the relationship between dementia, cancer, cardiovascular diseases and nutrition in cohort studies.

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