

and niacin) intake of females (avg  $\approx$  91%) was higher than that of males (avg  $\approx$  76%). Average carbohydrate intake for males and females was  $240 \pm 39.4$  and  $197.1 \pm 50$  g, respectively, and both were about 55% of total energy intake. Average fat intake was  $60.6 \pm 20.4$  and  $50.5 \pm 18.5$  g, respectively, representing about 31% of total energy intake.

## DISCUSSION

We can not ascertain the degree to which the responses received from this survey represent the nutritional status of all patients with Parkinson disease in Taiwan. This survey provides the first study which relates anthropometric indices and nutrient intake of PD patients.

Weight loss, since the onset of disease, was experienced by 8% of patients. A BMI of less than 20 was seen in 15% of patients. Anthropometric surveys of patients did not show that lean body mass (i.e, MAC and AMC) was lower than that of a normal population in a Taiwanese survey. The results of this study are contradictory to those Reports.<sup>1,2</sup> There were negligible changes in gastrointestinal functions, and the responses to drugs were minimal in this study. Most patients had a habit of snacking between meals. Patients with PD who had less than 11-year duration of disease showed no apparent malnutrition status according to the criterion of Markus et al.<sup>2</sup> All of these conditions would help explain why under-nutrition of patients did not exist in this study.

Men and women patients respectively had 87% and 79% of the RDNA energy intake. The protein intake of PD patients was above 90% of RDNA. Average carbohydrate and fat intakes of patients were 55% and 31% of total energy intake, respectively. Patients with PD had normal albumin levels ( $42.22 \pm 3.32$  mg/ml).<sup>7</sup> All these results are similar to those obtained by Abbott et al.,<sup>1</sup> but are contrary to those of Beyer et al.<sup>3</sup> We suggest that the present results support that patients with less than an 11-year duration of disease have adequate nutrient intake and nutritional management.

Weight and BMI are weakly negatively correlated with the clinical parameter, duration of stage of disease ( $r = -0.22$  and  $r = -0.32$  respectively), but these are not statistically significant. A further investigation of nutritional assessments of patients with longer disease duration is needed.

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