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## A pilot study of low-carbohydrate diet intervention on overweight or obese elderly people in China

Yan-Bin Ye<sup>1</sup>, HOI YAN. HO<sup>2</sup> and Shu-Yu Zhuo<sup>1</sup>

<sup>1</sup>The First Affiliated Hospital of Sun Yat-sen University, Guangzhou, China and

<sup>2</sup>The First Affiliated Hospital of Jinan University, Guangzhou, China

### Abstract

**Introduction:** Muscle-reducing obesity is the most common form of obesity in the elderly, so it is more difficult for the elderly to lose weight. The efficacy and safety of low-carbohydrate diet (LCD) for weight loss in the elderly remains controversial. This study aimed to explore the effect and safety of LCD on weight loss in overweight and obese elderly people.

**Materials and Methods:** Obese or overweight elderly (> 60 years old) with a BMI greater than 24 were recruited to use a restricted LCD for 1–3 months for weight loss intervention. According to the time, participants were divided into short-time group (< 30 days), medium-time group (< 31–60 days) and long-time group (> 60 days). The enrolled subjects were given an energy-restricted LCD for weight reduction intervention (1200–1400 kcal/d, carbohydrate accounts for 15–20% of energy). The primary outcome was change in body composition included weight, BMI, fat mass, and waist circumference, and there were other secondary outcomes including blood sugar, blood lipid and uric acid.

**Results and Discussion:** Thirty-two obese or overweight elderly completed a LCD for 1–3 months, mean age were  $64.9 \pm 4.2$  years, median intervention time was 56 (range: 26,100); mean BMI was  $29.62 \pm 3.70 \text{ kg/m}^2$ . After LCD intervention, the average body weight of the three groups decreased by  $2.92 \pm 0.77 \text{ kg}$ ,  $5.57 \pm 1.99 \text{ kg}$  and  $10.48 \pm 2.63 \text{ kg}$ ; the average BMI decreased by  $1.43 \pm 0.34 \text{ kg/m}$ ,  $2.18 \pm 0.99 \text{ kg/m}$  and  $3.18 \pm 1.77 \text{ kg/m}$ ; the average body fat decreased by  $2.28 \pm 0.43 \text{ kg}$ ,  $4.07 \pm 2.08 \text{ kg}$  and  $7.05 \pm 2.53 \text{ kg}$ ; and the average muscle decreased by  $0.68 \pm 0.76 \text{ kg}$ ,  $1.32 \pm 0.78 \text{ kg}$  and  $2.45 \pm 2.03 \text{ kg}$  ( $P < 0.05$ ). The average muscle loss was less than 20% of the total weight loss. Covariance analysis adjusted by sex and age showed that the percentage changes of body weight, BMI, body fat and waist circumference were significant different among the three groups ( $p < 0.05$ ), which had linear trends with the intervention time, while the percentage of muscle and body fat decreased was not significantly different among the three groups, and did not increase with the intervening time ( $p > 0.05$ ). Symptoms of patients with hypertension or sleep apnea syndrome were alleviated. There were no serious adverse events during weight loss. LCD with restricted energy is a safe and effective weight-loss intervention for overweight or obese elderly people. It can significantly reduce BMI and body fat without losing more muscle with the increase of weight loss time.

### Conflict of Interest

There is no conflict of interest