Weight change and the risk of hip fractures in patients with type 2 diabetes: a nationwide cohort study

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INTRODUCTION: In type 2 diabetes, patients are often asked to control their weight in order to reduce their diabetic morbidity. The American Diabetes Association recommends that diabetic patients conduct high-intensity interventions for regulating diet, physical activity, and behavior to reduce weight, followed by long-term comprehensive weight maintenance programs. Although such weight control attempts are required in diabetic patients, there are few studies on the effect of weight change on hip fracture in this population. We aim to investigate the association between body weight change and the incidence of hip fracture in subjects with type 2 diabetes using large-scale, nationwide cohort data on the Korean population.

METHODS: A total of 1,447,579 subjects (894,204 men and 553,375 women) > 40 years of age, who were diagnosed with type 2 diabetes, were enrolled in this study. Weight change within 2 years was divided into five categories: from weight loss ≥ 10% to weight gain ≥ 10%. The hazard ratios (HRs) and 95% confidence intervals for the incidence of hip fracture were analyzed, compared with the reference of the stable weight group (weight change < 5%).

RESULTS: Among 5 weight change groups, more than 10% weight loss showed the highest HR (HR, 1.605; 95% CI, 1.493 to 1.725), followed by more than 10% weight gain (HR, 1.457; 95% CI, 1.318 to 1.612). The effect of weight change on hip fracture risk was greater in males than in females, and those under 65 years of age were greater than those over 65 years of age. Baseline BMI did not play a role of weight change affecting the risk of hip fracture. The HR for hip fracture of subjects with regular exercise was lower than those without regular exercise.

DISCUSSION AND CONCLUSION:

In type 2 diabetes population, regardless of the BMI, both weight gain and weight loss were significantly associated with a higher risk of hip fracture, whereas maintaining body weight reduced the risk of hip fracture the most. In overweight or obese type 2 diabetic patients, although weight loss is associated with a higher risk of hip fracture, benefits of weight loss are likely greater than the costs from higher hip fracture risk. When considering weight loss in overweight or obese type 2 diabetic patients, it should be appropriate to consider measures for fracture prevention, such as resistance training, retention of lean body mass, and supplementation of calcium and vitamin D to prevent bone loss from weight loss.

Contrary to the literature that weight gain had a protective effect on hip fracture in the nondiabetic population, it was found that weight gain was associated with higher hip fracture risk in the diabetic population in this study. Therefore, nonobese patients with type 2 diabetes should be advised to maintain their weight so as not to gain weight.