Clinical Nutrition ESPEN xxx (2017) 1–7

Contents lists available at ScienceDirect

Clinical Nutrition ESPEN

journal homepage: http://www.clinicalnutritionespen.com

Original article

Smoking cessation contributes to weight gain in patients with hepatobiliopancreatic malignancy

Taiichi Wakiya*, Keinosuke Ishido, Daisuke Kudo, Norihisa Kimura, Shingo Sakuraba, Shinji Tsutsumi, Takuji Kagiya, Chiaki Uchida, Kenichi Hakamada

Department of Gastroenterological Surgery, Hirosaki University Graduate School of Medicine, Japan

ARTICLE INFO

Article history:
Received 6 June 2017
Accepted 13 December 2017

Keywords:
Tobacco
Smoking cessation
Weight gain
Nutritional status
Malignancy

SUMMARY

Background & Aims: The relationship between smoking cessation and weight gain is well recognized. However, there is no data currently available on the effect of smoking cessation on weight gain in patients with malignancy. The aim of this study was to clarify the body weight (BW) change after smoking cessation in patients with malignancy.

Methods: We retrospectively analyzed 159 subjects who underwent hepatobiliopancreatic surgery. The smoking status was determined using questionnaires administered at the initial presentation, and the candidates were divided into two groups: recent quitters and nonsmokers. The change in the BW was compared between these two groups.

Results: There were 134 subjects with malignant disease (84.3%), with a median age of 68 (range: 26–84) years. In the nonsmoker group, 28 of 116 subjects (24.1%) gained weight between the initial presentation and admission. In the recent quitter group, 12 of 18 subjects (66.7%) gained weight in the same period ($P < 0.01$). Regarding the change in the BW from the initial presentation, recent quitters gained more weight than nonsmokers (+1.7 kg [+2.7%] vs. −1.0 kg [-2.0%], $P < 0.01$). Furthermore, the improvement from the initial presentation was seen in a higher percentage of recent quitters than nonsmokers with respect to Onodera's prognostic nutritional index (61.1% vs. 36.2%, $P = 0.04$) and the controlling nutritional status score (38.9% vs. 19.3%, $P = 0.07$).

Conclusions: Weight gain due to smoking cessation was observed even in patients with hepatobiliopancreatic malignancy.

1. Introduction

The relationship between smoking cessation and weight gain is well recognized [1–7]. On average, smokers tend to have a lower body weight (BW) than nonsmokers, and former smokers have a greater BW than current smokers [7,8]. A recent meta-analysis including 62 randomized controlled trials concluded that smoking cessation was associated with a mean weight gain of 4–5 kg after 12 months of abstinence [9]. Some longitudinal research suggests that quitters gain 6.5–9 kg within 8 years after cessation [10–12]. However, to our knowledge, no data is available regarding the effect of smoking cessation on weight gain in patients with malignancy.

Malnutrition and weight loss are frequent in cancer patients and have a negative effect on clinical outcome [13–18]. To address the issues, the European Society for Clinical Nutrition and Metabolism (ESPEN) recently published evidence-based guidelines for action against cancer-related malnutrition [13,19]. These guidelines have been well considered from every aspect and contain significantly meaningful information for nutritional care in cancer patients. However, there was no mention of the effect of smoking cessation on cancer-related malnutrition. If smoking cessation has a positive effect on cancer-related malnutrition, that information will be beneficial to cancer patients. Therefore, the aim of this study was to

Abbreviations: BMI, body mass index; BW, body weight; CONUT, controlling nutritional status; ESPEN, the European Society for Clinical Nutrition and Metabolism; mGPS, modified Glasgow prognostic score; PNI, prognostic nutritional index.

* Corresponding author. Department of Gastroenterological Surgery, Hirosaki University Graduate School of Medicine, 5, Zaifu-cho, Hirosaki, Aomori, 036-8562, Japan. Fax: +81 172 395080.
E-mail address: wakiya1979@yahoo.co.jp (T. Wakiya).

https://doi.org/10.1016/j.clnesp.2017.12.011
2405-4577/

clarify the BW change after smoking cessation in patients with malignancy.

2. Methods

This retrospective cohort study was approved by the institutional review committee of the Hirosaki University Graduate School of Medicine (Hirosaki, Japan).

2.1. Subjects

Subjects undergoing hepatobiliopancreatic surgery between November 2012 and November 2016 were considered for this study. Of these, the 159 subjects who did not meet any of the exclusion criteria were retrospectively analyzed in this study (Fig. 1). The exclusion criteria were as follows: undergoing emergency surgery, no preoperative laboratory data, multiple primary cancers, incapable of oral intake and cases that had been admitted to a different hospital until being admitted to our department. All subjects in our study were advised to take adequate nutrition during the surgery waiting period, but they did not receive unified preoperative nutritional intervention.

2.2. Smoking status

Smoking status was determined using the questionnaires administered at the initial presentation at our department. Using this information, the 159 subjects were divided into two groups: a recent quitters group, including those who quit smoking after their initial presentation at our department, and a nonsmokers group, including never-smokers and former smokers who had quit before the initial presentation at our department. Because the association between preoperative smoking and postoperative complications is well recognized [20,21], our institutional policy does not allow current smokers to undergo an elective surgery. Thus, there were no continuous smokers.

2.3. Analyzed parameters

The medical records of all subjects were retrospectively reviewed, and the change in the BW was compared between the groups. The BW was measured using a digital BW scale at the initial presentation and admission for the surgery. In addition, changes in the laboratory data and nutritional index were also analyzed. Onodera's prognostic nutritional index (PNI) [22] was calculated as follows: $10 \times$ serum albumin (g/dL) $+ 0.005 \times$ total lymphocyte count (/μL). In addition, the modified Glasgow prognostic score (mGPS) [23] and the controlling nutritional status (CONUT) score [24] were assessed.

2.4. Statistical analyses

Continuous variables were expressed as the medians (ranges) and analyzed using nonparametric methods for non-normally distributed data (Mann–Whitney *U* test). Categorical variables were reported as numbers (percentages) and analyzed using the chi-squared test or Fisher's exact test, as appropriate. A difference was considered to be significant when the P value was less than 0.05. Correlations were assessed using Spearman's correlation. A statistically significant correlation was defined as a correlation coefficient (r) > 0.3. A difference was considered to be significant for values of $P < 0.05$. The statistical analyses were performed using the Predictive Analytics Software Package (PASW) (version 18.0; SPSS Inc. Chicago, IL, USA).

3. Results

3.1. Patient demographics

The preoperative characteristics and body composition parameters of the subjects are shown in Table 1. There were 93 male and 66 female subjects with a median age of 68 (range: 26–84) years. Of these, 75 (47.2%) were never-smokers. Approximately 16% of

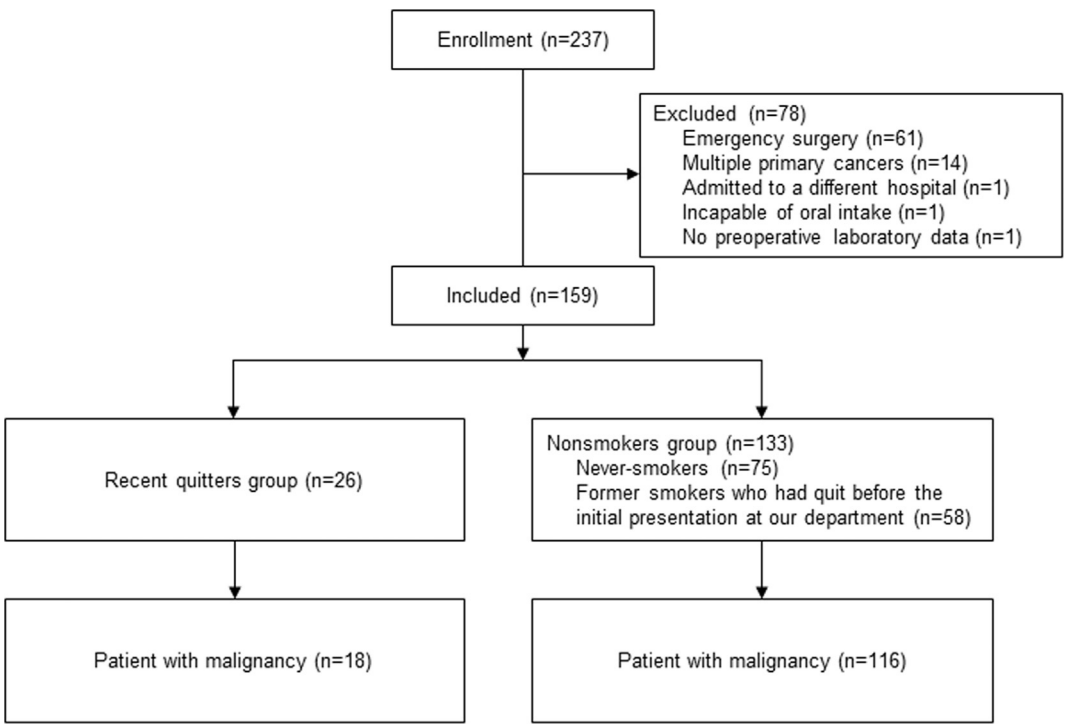

Fig. 1. Flow chart of the study patient selection.

Please cite this article in press as: Wakiya T, et al., Smoking cessation contributes to weight gain in patients with hepatobiliopancreatic malignancy, Clinical Nutrition ESPEN (2017), https://doi.org/10.1016/j.clnesp.2017.12.011