Original Research

NUTRITIONAL STATUS OF PATIENTS BEFORE STOMACH SURGERY AT THAI BINH PROVINCIALGENERAL HOSPITAL IN 2019

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ABSTRACT

Aims: To describe nutritional status and dietary pattern of patients before stomach surgery at the Thai Binh Provincial General Hospital from June 2019 to March 2020.

Methods: A scross-sectional study was conducted on 67 patients aged over 18 years who were indicated for open gastrectomy. Nutritional status was evaluated using the Subjective Global Assessment (SGA) and Mini Nutritional Assessment (MNA).

Results: A rate of chronic energy deficiency was 25.4% in the admitted patients and increased to 59.7% when they were discharged. There were 80.6% of patients with mild and moderate malnutrition assessed by SGA. About 71% of the patients were at risk of malnutrition and 25.8% of malnutrition assessed by MNA. There were 19.4% of the patients with low serum albumin level (< 35 g/L). The rate of weight loss in the last 6 months was 52.2%; The average dietary energy was 1433.6 kcal; The percentage of subjects meeting the requirement for energy-generating substances was 7.5, 76.1, and 53.7%, respectively, for glucide, lipid, and protein.

Conclusion: The very high rate of malnutrition was found in the patients before stomach surgery. It is necessary to evaluate the nutritional status of the patients and give them an appropriate nutrition during hospitalization.

Keywords: nutritional status, dietary, stomach surgery

I. INTRODUCTION

Malnutrition in hospitalized patients is a common problem in both developed and developing countries. Several previous nutrition studies of hospitalized patients have shown that the prevalence of malnutrition ranges from 20% to over 50% depending on the country and the type of disease [1, 2].

Patients undergoing surgery, especially gastrectomy, have a higher risk of malnutrition than other hospitalized patients. In addition to malnutrition status before surgery, the surgery itself changed the metabolism and physiology of patients; and complications may occur such as

infection of the surgical site, bacterial infection, bleeding, and stress, making the malnutrition status worse. In 2008, Tangvik RJ et al conducted a study at Haukeland University Hospital and found that the rate of malnutrition in the hospital was 29% while that in surgical patients was 51% [2].

Clinical assessment of nutritional status is an important first step in nutritional care and should be performed from the outset of patient admission to identify patients at risk of malnutrition. Previous research has shown that the incidence of malnutrition in hospitals can be reduced after appropriate nutritional interventions through improving food quality, nutrition education, and implementing nutrition screening. Therefore, research on the nutritional status of patients before and after surgery is needed to help develop a nutritional plan suitable for the patients, to prepare the patients before surgery, to make a prognosis and to evaluate treatment. We conducted the study with the aim to determining nutritional status and dietary characteristics of patients before and after gastrectomy at the Department of General Surgery and Department of Oncology Center.

II. METHODS

2.1. Study design and and subjects

A cross-sectional study was conducted from June 2019 to March 2020 on patients who were indicated for open gastrectomy at the Department of General Surgery, Oncology Center of Thai Binh Provincial General Hospital.

Inclusion criteria:
∗ All patients hospitalized for the gastric bypass surgery

2.2. Sample size and sampling

Sample size was estimated using the formula:

$$n = Z^2_{\left(1-\frac{\alpha}{2}\right)} \frac{p(1-p)}{d^2}$$

− *n*: sample size;
− *p* = 0.242: malnutrition rate by Subjective Global Assessment in

Exclusion criteria:
∗ Patients could not be interviewed: confused, psychotic...or
∗ Patient's height and weight cannot be measured (edema, hunchback, coma, amputation...), or
∗ Patient did not cooperate with the study.

patients before gastrectomy according to a previous study [3];
− d = 0.11: absolute precision;
− Z_{1-α/2} = 1.96 when α = 0.05;
Calculated sample size: *n* = 58.

A total of 67 eligible patients matched the selection and exclusion criteria and agreed to participate in the study.

2.3. Data collection

Direct interviews with patients using pre-designed questionnaires. Nutritional status of patients was evaluated using the Subjective Global Assessment (SGA) [4], and Mini Nutritional Assessment (MNA) for elderly patients [5]. Weight was measured by Tanita scale (accuracy: 0.1kg) and standing height was measured with a wooden ruler (accuracy: 1 mm). Body Mass Index (BMI) is a

person's weight in kilograms divided by the square of height in meters. Nutritional status was classified using BMI cut-offs recommended by World Healt Organization [6]. Patients were examined clinically to detect symptoms such as loss of subcutaneous fat, edema, muscle atrophy, ascites, etc. Biochemical test included quantification of hemoglobin, quantification of serum albumin and check rations before surgery. Hypoalbuminemia was defined as serum albumin levels lower than 35 g/L [7]. Nutrient intake was identified using a 24-hour dietary recall.

2.3. Data analysis

Screened data from the form after the interview. Data were entered using Epi Data software. The collected data were processed according to the biomedical statistical algorithm, using SPSS 22.0 software.

2.5. Ethical consideration

Subjects have the right to voluntarily participate or not participate. Patients and family members of patients participating in the study are advised on how to eat properly and do not have to pay any additional fees from research activities. The research results are intended to serve treatment and care consulting activities and are kept research information in a confidential mode that does not affect the patient.

III. RESULTS

Table 1. *Characteristics of participants before gastrectomy*

Characteristics	Women (*n*=45)	Men (*n*=22)	Total (*n*=67)	*p*-value
Age group (years)				
40–49	5 (11.1)	3 (13.6)	8 (11.9)	0.312
50–59	13 (28.9)	2 (9.1)	15 (22.4)	
60–69	16 (35.6)	9 (40.9)	25 (37.3)	
≥ 70	11 (24.4)	8 (36.4)	19 (28.4)	
Weight loss before hospitalization				
Remain	0 (0.0)	1 (4.5)	1 (1.5)	0.063
Decrease	27 (60.0)	8 (36.4)	35 (52.2)	
Not performed	18 (40.0)	13 (59.1)	31 (46.3)	
Weight (kg)	51.2 ± 7.2	54.1 ± 6.3	51.2 ± 7.2	0.096
<65 years	47.0 ± 4.3	54.0 ± 5.0	52.3 ± 5.7	
≥ 65 years	44.1 ± 5.1	54.3 ± 7.9	50.1 ± 8.5	
Height (cm)	156.2 ± 3.8	166.3 ± 4.2	163.8 ± 6.0	<0.001
<65 years	152.8 ± 4.1	166.6 ± 4.6	160.8 ± 8.2	
≥ 65 years	154.2 ± 4.2	166.5 ± 4.3	162.4 ± 7.2	

Data are in n (%), except for weight, height and body mass index (BMI) in mean ±SD

Table 1 shows the characteristics of age, weight and height of the participants before gastrectomy. Of the total 68 patients, 35 (52.2%) had a history of weight loss; and weight loss had a tend to higher in men compared to women. The average BMI in patients under ≤ 65 years old (18.4±1.4 kg/m^2) was lower than in patients > 65 years old (19.2±2.0 kg/m^2). The mean BMI in male patients (19.5±1.6 kg/m^2), was higher than that in female patients (19.0±1.8 kg/m^2). The smallest BMI was 13.5 kg/m^2 in the group of female patients > 65 years old and the largest was 25.3 kg/m^2 in the group of male patients > 65 years old.

Table 2. *Classification of nutritional status of patients by sex based on BMI, SGA, and MNA before surgery*

Nutritional status	Women	Men	Total	*p*-value
BMI classification	(*n* = 45)	(*n* = 22)	(*n* = 67)	
CED (<18.5 kg/m^2)	11 (24.4)	6 (27.3)	17 (25.4)	1.000
Normal (18.5–24.9 kg/m^2)	33 (73.3)	16 (72.7)	49 (73.1)	
Overweight-obesity (≥ 25.0 kg/m^2)	1 (2.2)	0	1 (1.5)	
SGA classification	(*n* = 27)	(*n* = 9)	(*n* = 36)	
Well nourished	5 (18.5)	2 (22.2)	7 (19.4)	1.000
Mildly & moderately Malnourished	22 (81.5)	7 (77.8)	29 (80.6)	
MNA classification	(*n* = 18)	(*n* = 13)	(*n* = 31)	
Well nourished	1 (5.6)	0	1 (3.2)	0.824
At risk	13 (72.2)	9 (69.2)	22 (71.0)	
Malnourished	4 (22.2)	4 (30.8)	8 (25.8)	

Data are n (%). p-value by Fisher's exact test; CED, chronic energy dediciency.

Table 2 shows the nutrition status of the patients by sex based on BMI, SGA, and MNA before surgery. There was no significant difference between men and women in nutritional status in three classification. The overall prevalence of chronic energy deficiency (CED) and overweight-obesity were 25.4% and 1.5%, respectively. By the SGA method, there were 80.6% of patients at risk of mild malnutrition, 19.6% of patients without risk. By the MNA method, there were 71% of patients at risk of mild malnutrition, 25.8% with malnutrition.

Table 3 shows that a change in weight on admission day was 51.3±7.2 kg compared with discharge day was 48.3±7.1 kg, the difference was statistically significant with *p* <0.01. BMI in the patient decreased after surgery with admission day was 19.3±1.7 kg/m^2 compared with discharge day was 18.2±1.7 kg/m^2. The percentage of patients with CED after surgery increased from 25.4% at the day of admission to 59.7% at the day of discharge.

There were 19.4 of patients with low serum albumin level (< 35 g/L). This rate in was 13.3% in men and 31.8% in women.

Table 3. *Changes in weight, BMI and nutritional status according to BMI of patients before and after surgery*

Change	Hospitalized	Discharge	*p*-value
Weight (mean±SD)[a]	51.3 ± 7.2	48.3 ± 7.1	<0.001
BMI (mean±SD)[a]	19.3 ± 1.7	18.2 ± 1.7	<0.001
BMI classification[b]			<0.001
Chronic energy deficiency	17 (25.4%)	40 (59.7%)	
Normal	49 (73.1%)	27 (40.3%)	
Overweight and obesity	1 (1.5%)	0 (0%)	

[a] *Data are mean ±SD, p-value by Student t test. BMI, body mass index.*
[b] *Data are n (%), p-value by Fisher's exact test*

Table 4. *Anemia of patient before surgery according to hemoglobin concentration*

Level	Women (n =45)		Men (n =22)		Total (n = 67)		*p*-value
Severe anemia	5	11.1	4	18.2	9	13.4	
Moderate anemia	6	13.3	6	27.3	12	17.9	0.145
Mild anemia	12	26.7	6	27.3	18	26.9	
Normal	22	48.9	6	27.3	28	41.8	

*Data are n (%), p-value by Fisher's exact test*

Table 4 shows the anemia of patients before surgery divided by Hb concentration. The highest rate was mild anemia (26.9%), followed by moderate anemia (17.9%), and the lowest rate was anemia severe (13.4%. The was no significant difference of amemia rates between men and women.

Figure 1 shows the percentage of dietary energy-generating substances. Of the total energy intake, carbohydrates accounted for the highest part (59.0%), followed by lipids (24.0%) and protein (17.0%).
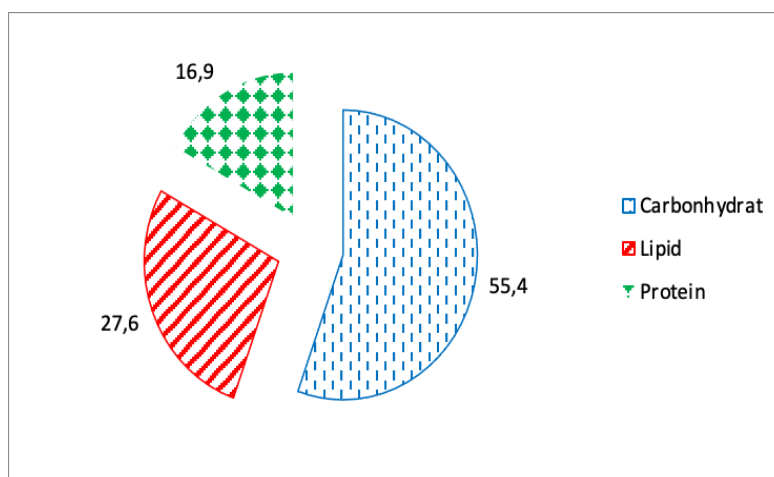
Firgure 1. *Percentage of dietary energy-generating substances*

Figure 2 indicates that: 75% of the patients met the energy requirement, 89.7% of the patients met the protein requirement, the glucose requirement was 77.6%, and the lipid requirement was 72,4% .
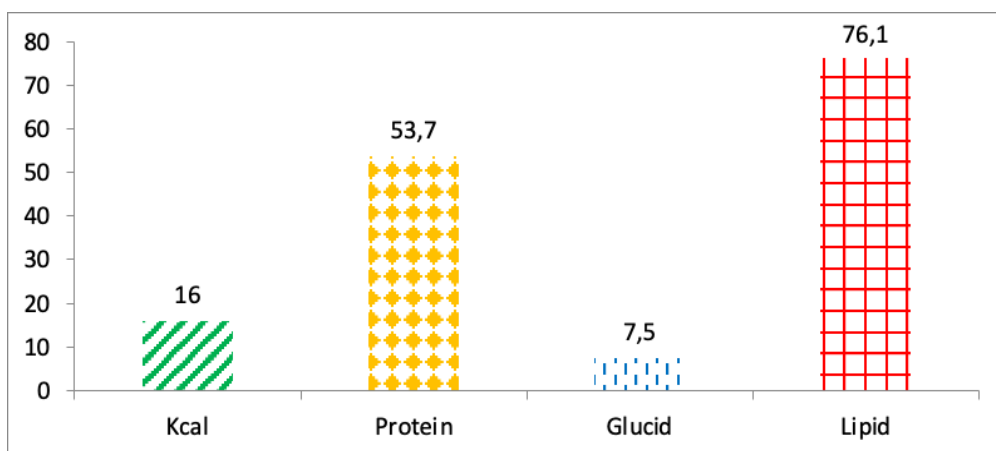
Figure 2. *Percentage of subjects that met the requirement for the volume of biological substances ration energy*

IV. DISCUSSION

In the study, the patients aged ≥ 60 years occupied 65.7%, showing that the group had a main part of the total patients. The male-female ratio was 2.0 in the patients, consistent to previously published studies, e.g. the ratio of 1.75 in patients with gastrointestinal surgery in the Department of Surgery, Bach Mai Hospital in 2016 [3], and the ratio of 1.95 in patients before gastrectomy at the Military Hospital 103 [8]. The explanation for higher rate of stomach surgery in men may be due to the fact that men have higher risk behavioral factors than women such as: not paying attention to diet, eating at the wrong

time, drinking alcohol at harmful levels, smoking, stress, overwork, unreasonable living...leading to the incidence of stomach cancer or other diseases requiring surgery gastric bypass.

Of the total patients, 52.2% had a history of weight loss, 46.3% were not weighed, 1.5% did not change their weight, and none had a history of weight gain. In the group of 46.3% of patients who did not self-check their weight, most of these patients did not have the habit of weight monitoring before but had noticed their obvious wasting, so in fact, the proportion of patients with a history of weight loss will be higher. Regularly monitoring your weight is a good habit to know your health status. Our study subjects live in rural areas, their awareness is limited, so they do not know the importance of regular weight monitoring. Clinically, determining the weight of patients regularly plays an important role to record the change in weight over time in order to calculate the rate of weight gain or loss. The weight loss rate is an important indicator to determine the risk of malnutrition of patients, contributing to determining treatment goals and monitoring nutritional status. Some causes of this weight loss are that most of the patients before gastric bypass surgery have symptoms of digestive disorders accompanied by a change in diet without enough energy as they mainly eats soft foods such as porridge, noodles, and milk. In addition, psychological factors about the disease, and dietary habits also increase weight loss.

Regarding the preoperative mean BMI value in men (19.5 ± 1.6) and women (19.0 ± 1.8), the results of our study are similar to the mean BMI of 19.1 in patients before gastric bypass surgery at Military Hospital 103 [8] and the mean BMI of 20.83 in patients before liver, biliary, and pancreatic surgery [9]. The mean BMI in our study is lower than some other authors' studies, perhaps because our study subjects are mainly stomach cancer patients who are at high risk of malnutrition due to inadequate nutrition, prolonged digestive disorders reduced absorption.

The CED rate was 25.4% in our patients before gastric bypass surgery, equivalent to CED rate in some previous studies: 25.8% in patients before surgery of liver and biliary tract at Cho Ray hospital in 2011 [9]; 24.2% in patients undergoing gastrointestinal surgery at Bach Mai Hospital in 2016 [3].

The rate of malnutrition evaluated by SGA in our study was 80.6%. The rate of malnutrition (SGA-B and SGA-C) in this study was higher than the malnutrition rate (56.7%) in patients before hepatobiliary tract surgery at Cho Ray Hospital [9]. Causes of liver, biliary, and pancreatic surgery often have a history of mild disease that does not affect the patient's function of eating and absorbing nutrients, while our study subjects are all patients with stomach disease and chronic pain (due to ulcers or cancer), so the patients are very exhausted. In our study, there were no patients under 65 years of age at risk of severe malnutrition (SGA C). The rate of malnutrition according to SGA in our study is similar to the result (89.3%) of author Truong Thi Thu in patients before gastric bypass surgery at Military Hospital 103 [8]. Such a high rate in our study subjects may be because all patients have chronic stomach disease and their condition is much depleted. In addition, the patients may have low income, live in rural areas, have limited

awareness, and do not have periodic health check detect disease early.

Using MNA method in patients over 65 years old, our study has an overall rate of malnutrition was 25.8%, the rate of patients at risk of malnutrition was 71.0% (59.1% in men and 40.9% in women). This result is higher than most other studies. Research by author Ho Van Thang at Tan Ky General Hospital, Nghe An province has found that the rate of malnourished patients was 17.3%, and the rate of patients at risk of malnutrition was 63.5% [10].

To determine the rate of anemia in patients, we used the blood hemoglobin index before surgery. The results showed that the average hemoglobin consentration was 114.1 ± 30.8 g/L. The overall anemia rate of patients was 58.2%, of which the highest rate was mild anemia (26.9%), followed by moderate anemia (17.9%), and severe anemia (13%). The rate of anemia in our study is higher than that in many other studies, such as 42.7% of anemia in stomach cancer patients at Ho Chi Minh City University of Medicine and Pharmacy Hospital in 2018 [11]. The reason for such a high rate of anemia in our study is that patients are often tired, have a lot of abdominal pain, and don't want to eat anything. This situation makes them eat insufficient quantity and quality, and lack of food and nutrients. Patients with the long-term disease may experience complications such as gastric perforation, gastrointestinal bleeding such as vomiting blood, and black stools, causing patients to experience acute blood loss in high quantity. In addition, the patients studied by the above author are rare cases of acute blood loss and large amounts of blood loss.

Overall albumin reduction rate in our study was 19.4% of the patients (13.3% in men and 31.8% in women). The results on the rate of albumin reduction are similar to the results of the study by Nguyen Thi Lan Huong on newly admitted cancer patients at Phu Tho Provincial General Hospital in 2014 with 20% decrease in albumin [12].

V. CONCLUSION

The rate of malnutrition in patients before stomach surgery was very high. So, the hospitalized patients need to have their nutritional status assessed to offer supportive solutions and appropriate nutrition for better treatment prognosis.

Recommendations

* It is necessary to conduct a nutritional status assessment, consultation, and nutritional care planning with patients with malnutrition and at risk of malnutrition.

* Adequate nutritional support is required before surgery, especially for the group that needs to improve nutritional status (risk of malnutrition and malnutrition).

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