Original Research/Review

NUTRITIONAL STATUS OF PATIENTS BEFORE THYROID SURGICAL AT THE NATIONAL HOSPITAL OF ENDOCRINOLOGY IN 2022

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ABSTRACT

Aims: To evaluate the nutritional status of patients before thyroid surgery at the Thyroid Surgery Department, National Hospital of Endocrinology in 2022.

Methods: This was a cross-sectional study on 163 patients before thyroid surgery. Nutritional status of the patients was investigated using body mass index (BMI), mid-upper arm circumference (MUAC), and subjective global assessment (SGA).

Results: The rates of malnutrition according to SGA and BMI were 31.3 and 7.4%, respectively. The rate of overweight according to BMI was 10.4%. The rate of obesity was 1.8% according to BMI, while it was 0% by MUAC classification.

Conclusion: High rate of malnutrition was presented in the patients before thyroid surgery. It is important to use SGA to evaluate the patients and give an appropriate intervention of nutrition to prevent severe effects of malnutrition on surgical patients.

Keywords: *nutritional status, thyroid surgery, surgical nutrition, endocrine, National Hospital of Endocrinology.*

I. INTRODUCTION

The thyroid is an important endocrine gland that provides a lot of functions and metabolisms of the body as well as the operation of many systems. Depending on the thyroid disease, the patient is treated with internal treatment by using radioisotope I^{131} or designated surgical treatment in cases when internal treatment is ineffective, for cancer patients, or for aesthetic reasons. Surgical treatment often gives long-term and sustainable results, but after surgery, some complications can still occur such as postoperative bleeding, respiratory failure, paroxysmal hyperthyroidism, and postoperative tetani attacks, especially for patients with poor preoperative nutritional status [1].

Many studies have shown that patients with a poor nutritional situation before surgery have an increased rate of infection, increased mortality, and more complications compared with well-nourished patients [2]. The rate of malnutrition accounts for 20–50% of

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hospitalized patients [3]. A prospective study with 1500 hospitalized patients in medical and surgery wards indicates that 62.9% lost weight during their stay [4]. Therefore, we carried out this study to assess the nutritional status of patients before thyroid surgery at the National Hospital of Endocrinology in 2022.

II. METHODS

2.1 Study design

A cross-sectional study was conducted on patients with indications for thyroid surgery at the Department of Thyroid Surgery, National Hospital of Endocrinology, from March 2022 to May 2022.

Patients were excluded from the study if they had one of the following criteria: pregnance, serious complications, emergency indications, severe prognosis or unable to measure height and weight.

2.2. Sample size and sampling method

The sample size was calculated using the formula:

$$n=Z^2_{1-\alpha/2}\frac{p(1-p)}{(\varepsilon.p)^2}$$

Where: $Z_{1-\alpha/2}$=1.96 with α=0.05; *p*: 0.557 [5]; ε=0.15: relative deviation. The calculated sample size was 136 patients.

The convenient sampling method was used to sellect subjects from all patients admitted to the hospital during the study period. As a result, 163 patients satisfying the above selection criteria were selected for the study.

2.3. Data collection

Nutritional status of the patients was evaluated using body mass index (BMI), mid upper arm circumference (MUAC), and subjective global assessment (SGA).

Height and weight of the patients were measured. BMI is caculated based on the formula: BMI= kg/m^2 where kg is a person's weight in kilograms and m^2 is their height in metres squared. BMI values of the patients were classified using the cut-offs of World Health Organization [6]: normal (18.5 – <25), severe thinness (< 16), moderate thinness (16 – <17), mild thinness (17– <18.5), overweight (25 – <30), obese grade I (30 – <35), obese grade II (35 – <40), and obese grade III (> 40).

Mid-upper arm circumference (MUAC) is the circumference of the left upper arm, measured at the mid-point between the tip of the shoulder and the tip of the elbow (olecranon process and the acromium). MUAC cut-offs for malnutrition were determined at < 23 cm for women and < 24 cm for men.

Direct interview and clinical check-up of the patients were applied to collect data on age, sex, residence, educational level, co-morbidities, diagnosis and duration of disease, previous 6 months' weight. Laboratory and diagnostic indicators were recorded in the medical examination book with outpatients and medical records with inpatients.

Subjective Global Assessment was used to check the nutritional status of the patients. SGA classification of nutrition is as following [7, 8]:

- SGA-A (no risk of malnutrition): Diet unchanged, 5% weight loss in the past 6 months, weight gain within the past 2 weeks, no gastrointestinal symptoms lasting more than 2 weeks, function normally, without loss of subcutaneous fat and muscle mass.
- SGA-B or SGA-C, but recently the diet has improved, and clinical symptoms, digestive symptoms, and functions have all improved.
- SGA-B (moderate risk of malnutrition): Reduced portion size, 5–10% weight loss in the past 6 months, no weight gain in the past 2 weeks, some gastrointestinal symptoms lasting more than 2 weeks, moderate functional impairment or recent worsening trend. Moderate loss of subcutaneous fat and/or muscle mass, mild to moderate edema, and ascites. Or SGA-C but clinical symptoms, digestive symptoms, and functions have improved.
- SGA-C (risk of severe malnutrition): Significant reduction in dietary intake, more than 10% weight loss severe in the past 6 months, weight loss within the last 2 weeks, all 4 gastrointestinal symptoms lasting more than 2 weeks, obvious loss of subcutaneous fat and/or muscle mass, edema and ascites severity level.

Unintentional weight loss is distinguished from intentional weight loss (fasting, weight loss). Starvation/fasting weight loss is characterized by weight loss mainly due to fat mass and only a small amount of muscle mass loss. Weight loss rate was calculated according to the formula:

$$\text{Weight loss rate} = \frac{\text{Normal weight} - \text{Current weight}}{\text{Normal weight}} \text{x} 100$$

2.4. Data analysis

Data entry Use Epidata 3.1 software to clean and enter data. Use Stata 14.0 software to analyze data. Categorial variables were shown as frequency (*n*) and percentage (%) and compared using Chisquared test. Continuos variables were presented as means ± standard deviation (SD) and compared using Student t test.

2.5. Ethnics consideration

The study was conducted with the approval of the thyroid surgery department, the National Hospital of Endocrinology, and the Ethics Committee. Research subjects were explained the purpose, content, and meaning of the study before conducting the interview and only conducted with the subject's consent. During the process, if for any reason, the research subject did not want to continue participating, after being consulted and persuaded, but still wants to stop, it would be accepted. The data, information collected and research results were only used for research purposes and not for any other purpose.

III. RESULTS

The average age of the patients was 44.3 years. The youngest subject was 18 years old and the oldest subject was 79 years old. The rates of the 18–39, 40–59, and ≥ 60 years groups were 39.9, 47.2, and 12.9%, respectively.

The most common diseases in the thyroid gland included multinodular goiter (44.2%), thyroid cancer (41.7%), mononucleosis (9.8%), and other thyroid diseases (4, 3%).

The rate of the medical history was detected at 66.9% of the patients including diabetes (5.5%), hypertension (11.7%), cardiovascular (1.8%), and the others (47.9%).

Table 1. *Anthropometric characteristics of the patients*

Characteristics		Values		
		Min	Max	Mean ± SD
Height (cm)	Female	145	170	156 ± 4.9
	Male	160	180	168.2 ± 5.3
Weight (kg)	Female	38	80	53.6 ± 6.9
	Male	47	85	63.6 ± 10.1
BMI (kg/m^2)	Female	16.2	33	22.0 ± 2.8
	Male	17.1	26.7	22.2 ± 2.6
MUAC (cm)	Female	20	28	24 ± 2.74
	Male	23.5	28	25.47 ± 1.3

Table 1 shows the values of height, weight, BMI, and MUAC in men and women. Table 2 shows the results of biochemical test in 163 subjects. The rates of increased value of serum glucose, total cholesterol, triglyceride, low density lipoprotein-cholesterol were 24.5, 38.3, 25.3, and 70.4%, respetively. The rate of decreased level of high density lipoprotein-cholesterol was 82.61%.

The rate of malnutrition according to MUAC was 0 %. Using BMI, the nutritional status of the patients was classified as follows: normal (80.4%), obese I grade (1.8%), overweight (10.4%) mild thinness was 5.5% and moderate thinness was 1.8%.

Using SGA method in 163 subjects, the proportion of patients at risk of malnutrition was 31.3% (SGA-B) and there was no patients with SGA-C.

The weight change in the last 6 months of the patients was found to be 68.8% at level A (< 5% stable weight loss, weight gain), 31.2% at level B (5–10% weight loss).

Table 2. *The results of biochemical test in the research subjects*

Tests	(Mean ± SD) (Min-Max)	Reference range	Rate, n (%)		
			Normal	Decrease	Increase
Glucose (mmol/L)	5.74 ± 1.54 (2.717 – 19.72)	4.1 – 5.9	121 (74.2)	2 (1.2)	40 (24.5)
TC (mmol/L)	5.15 ± 1.14 (2.84 – 10.02)	3.9 – 5.2	86 (53.1)	14 (8.6)	62 (38.3)
TG (mmol/L)	1.65 ± 1.72 (0.37 – 15.74)	< 1.7	121 (74.7)	0 (%)	41 (25.3)
LDL-C (mmol/L)	3.24 ± 1.33 (1.3 – 13.45)	< 2.6	48 (29.9)	0 (%)	113 (70.2)
HDL-C (mmol/L)	1.32 ± 0.32 (0.44 – 3.09)	> 1.03	133 (82.6)	28 (17.4)	0 (%)

TC, total cholesterol; TG, triglyceride; LDL-C, low density lipoprotein -cholesterol; HDL-C, high density lipoprotein -cholesterol

IV. DISCUSSION

Many studies have shown that low thyroid hormone levels lead to higher blood lipids, and increased blood pressure leads to patients at high risk of cardiovascular disease [9]. Thyroid hormone regulates cholesterol receptor cholesterol synthesis and cholesterol degradation rate Thyroid disease raises LDL-C levels, and elevated cholesterol levels have been shown to cause hypothyroidism. Normal thyroid hormone levels have a beneficial effect on cholesterol, especially in patients not taking thyroid medication [10]. The results showed that the proportion of patients with increased cholesterol (38.3%), increased LDL-C (70.2%), increased triglyceride (25.3%) and decreased HDL-C (17.4%) were in line with the results of Dundas LH [9]. Furthermore, a strong relationship exists between thyroid disorders that are impaired glucose control and diabetes, in 24.5% of patients with hyperglycemia. Both hypothyroidism and hyperthyroidism affect carbohydrate metabolism and have a profound effect on glucose control, so it is important to work closely with an endocrinologist during treatment [11].

Nutritional status classified by body mass index

In the study, the rate of patients with BMI under 18.5 kg/m^2 was 7.3% and the rate of overweight-obesity was 12.3%. This result is much lower than other studies performed on preoperative patients by many authors such as Dang Tran Khiem and colleagues performed on patients before surgery for liver, biliary, and pancreas at the Cho Ray Hospital [12] with 24.5% of 710

malnourished patients (BMI < 18.5) and 75.5% of patients with BMI within the normal range (BMI from 18.5 to less than 25). This difference may be due to many factors (such as duration of the study, patients before surgery thyroid gland in different disease stages, and different disease duration...). It may not be long enough to change the BMI of patients in this study. Thus, BMI is not sensitive to detecting nutritional deficiencies in the short term. BMI is a popular tool for assessing the nutritional status of normal people as well as patients. But recently, several authors, when comparing nutritional status according to different measures, have shown that BMI is not an appropriate method to assess the impact of malnutrition in hospitalized patients compared with the standard scale [10].

Nutritional status according to SGA classification

SGA is a method to quickly assess nutritional status, this is a method with high sensitivity and specificity in assessing nutritional status in surgical patients [8, 9]. In particular, the SGA method is also valuable in predicting postoperative infectious complications. The SGA method focuses on the patient's rapid weight loss, subcutaneous fat loss, degree of muscle atrophy, and gastrointestinal symptoms. The results showed that 68.7% of patients had good nutritional status (grade A according to SGA classification), and 31.3% of patients had moderate malnutrition status (grade B according to SGA classification). The results of this study are lower than the results of 57.7% of general surgery patients with moderate to severe malnutrition in the study of Dr. Pham Van Nang at Can Tho Central General Hospital in group of 274 patients with abdominal surgery: 35.4% of patients had malnutrition level B; 22.3% level C [5]). This difference may be partly due to the subjective assessment as well as the different nutritional statuses of the patients at each time point. Compared with some other authors, we found that the SGA-A group accounted for the majority, and the rate gradually decreased in the SGA-B and -C groups.

Weight is a basic and important indicator for assessing nutritional status. nutrition and health status of the body. Loss of more than 5% of body weight at any time is considered evidence of undernutrition. The results showed that patients with weight loss before admission in the last 6 months accounted for 31.2%. It is much lower than the results of the author Chu Thi Tuyet, patients with weight loss status before admission 2 months accounted for 77.4% [13]. This difference may be due to the disease factor, so the thyroid disease has clinical symptoms of eating a lot but still losing weight... these symptoms go away on their own after a while. In addition, the goiter, which is getting bigger and bigger, cause patients to swallow, pain, and loss of appetite. So if the weight is checked for 6 months, there is a possibility that there is a difference between the methods of assessing nutritional status, the SGA method stands out with many advantages. Instead, is a technique that combines multiple nutritional assessment factors to classify the severity of malnutrition.

V. CONCLUSION

Encourage people to be conscious of periodic health check-ups and monitoring to monitor and detect their nutritional status early, to improve nutritional status as well as to reduce unintentional weight loss. Presenting false evidence of unhealthy eating habits and lifestyles can aggravate the condition and prolong treatment.

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