

Nutritional Assessment for Surgical Patients by Bhumibol Nutrition Triage (BNT) and Subjective Global Assessment (SGA)

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Abstract

Objective: To compare Bhumibol Nutrition Triage (BNT) to Subjective Global Assessment (SGA) in surgical patients.

Study design: diagnostic test.

Subjects: A total of 200 patients admitted to the general surgical units, Bangkok Metropolitan Administration (BMA) Medical College and Vajira Hospital between January and June 2008.

Methods: The nutritional status was evaluated by BNT and SGA in term of score. Age, sex and diseases were also recorded.

Main outcome measures: sensitivity, specificity and 95% confidence interval.

Results: A total of 200 patients with mean age of 50.5 ± 11.5 years old were recruited. Thirty six percent of them were male while 64% were female. The most common diseases were hepatobiliary disease (20.0%) and large bowel malignancy (16.0%). Prevalence of malnutrition was 44.5% including mild-moderate malnutrition 35.0% and severe malnutrition 9.5%. The BNT score ≥ 4 had 78.7% sensitivity (95% CI, 73.0-84.3%) and 86.5% specificity (95% CI, 81.8-91.2%) to detect malnutrition.

Conclusion: Bhumibol nutritional screening tool is a simple and effective screening tool for detecting malnutrition in surgical patients.

Key words: Bhumibol Nutrition Triage, malnutrition, Subjective Global Assessment, surgical patient

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INTRODUCTION

Malnutrition is an important problem in surgical patient which can lead to lots of surgical complications and poor outcome. On the other hand, nothing per oral before and after surgery will lead to malnutrition.

One of the most popular methods to detect malnutrition is serum albumin level. It is correlated with postoperative complications^{1,2}. But half-life of albumin is 21 days so it takes time to change. In addition, there are other conditions than malnutrition that cause low serum albumin such as inflammation and serious infection. The more accurate and convenient technique is the Subjective Global Assessment (SGA). The SGA has been proved to be associated with clinical outcomes, complications and hospital stay.¹⁻⁵ This test alone is able to detect malnutrition in surgical patients. However, it is written in English and there are quite a lot of details. Therefore it is inconvenient to use by medical staff who are not doctors.

In Thailand, there are several nutritional screening tests developed for easier use such as the Bhumibol nutrition triage (BNT) and the nutritional screening in Surin Hospital. But there are no study about the sensitivity and specificity of those tests.

MATERIALS & METHODS

This study was a prospective analytical study in 200 patients who were admitted to the surgical wards at University of Bangkok Metropolis between January -June 1998. Inclusion criteria were new cases admitted in that period, age more than 15 years old, fully conscious, and ability to communicate. They were interviewed and evaluated by using SGA and BNT. Demographic data such as age, sex and disease were recorded.

BNT comprises of 4 categories (Table 1) with score 0-3 in each category. The total score of BNT is the sum of all categories. In category 4: disease and physical function, if there are more than one disease and score the only highest score is chosen for calculation.

RESULTS

A total of 200 cases, 72 cases (36.0%) were male and 128 cases (64.0%) were female. Mean age was 50.5 ± 11.5 (20-81 years) years. The diagnoses were hepatobiliary disease in 40 cases (20.0%), colorectal diseases in 32 cases (16.0%), esophageal diseases in 14 cases (7.0%), small intestinal diseases in 17 cases (8.5%)

Table 1 Bhumibol Nutrition Triage

1. BMI (kg/m²):					
21-25 = score 0,	19-20 or 26 - 27 = score 1,				
17-18 or 28-29 = score 2,	<17 or >29 = score 3.				
2. Unintentional weight loss during the past 3 months:					
0-1 kg = score 0,	2-3 kg = score 1,				
4-5 kg = score 2,	>5 kg = score 3				
3. History of dietary intake during the past 3 months:					
50-75% of normal intake = score 0,					
<50% but >25% of normal intake = score 1,					
<25% but >10% of normal intake = score 2,					
<10% or nothing per oral and receive only intravenous fluid >5-7 days = score 3					
4. Disease and physical function:					
No disease = score 0	mild disease = score 1				
Moderate = score 2	severe = score 3				
Cancer		0	1	2	3
AIDS		0	1	2	3
Trauma, Burn		0	1	2	3
Pulmonary, Cardiac, Renal disease, Diabetes Mellitus		0	1	2	3
Others: open wound, edema, ascites		0	1	2	3
Physical function was weighted from score 0-1 for normal to poor respectively.					
Physical function		0	1	2	3

Table 2 Demographic data (n = 200)

Total (cases)	200	
Male	72	(36.0%)
Female	128	(64.0%)
Mean age (years)	50.5 ± 11.5	(20-81)
Diseases (cases)		
Hepato-biliary diseases	40	(20.0%)
Colo-rectal diseases	32	(16.0%)
Esophageal diseases	14	(7.0%)
Benign intestinal diseases	17	(8.5%)
Miscellaneous e.g. breast diseases, appendicitis	97	(48.5%)

Table 3 SGA Class

SGA Class	Cases	Percentage
A (normal nourish)	111	55.5
B (mild to moderate malnourish)	70	35.0
C (severe malnourish)	19	9.5

and miscellaneous in 97 cases (48.5%). There were 103 cases (51.5%) with either intestinal disease or fasting more than three days after surgery (Table 2).

According to SGA, malnutrition was found in 89 cases (44.5%), which was mild to moderate malnutrition (SGA class B) in 70 cases (35.0%) and severe malnutrition (SGA class C) in 19 cases (9.5%) (Table 3).

BNT at each score was analyzed to show sensitivity and specificity in detecting malnutrition using SGA as a gold standard (Table 3). The sensitivity and specificity of BNT score ≥ 3 were 85.4% (95% CI, 80.5-90.3%) and 66.7% (95% CI, 60.1-73.2%) respectively. At BNT score ≥ 4 were 78.7% (95% CI, 73.0-84.3%) and 86.5% (95% CI, 81.8-91.2%) respectively.

DISCUSSION

Tests for nutritional status have been developed for a long time. In the past, nutritional test focused on objective assessment e.g. anthropometric measurement, biochemical laboratory and delayed cutaneous hypersensitivity skin test.¹ The examples for anthropometric measurement are body weight, height and triceps skin fold; for biochemical laboratory are serum albumin, prealbumin and transferrin level, and the last one is delayed cutaneous hypersensitivity skin test which is the way to test immunity response of skin to

the allergens. But none of these alone is perfectly interpret nutritional status because it must correlate with clinical status. For example, a patient with congestive heart failure may have normal weight or overweight in spite of malnutrition, and biochemical laboratory or delayed cutaneous hypersensitivity skin test can be abnormal in some conditions other than malnutrition. Therefore, blood test and skin test are not only invasive but also cost more money and have to correlate with clinical status.^{2,3} At present, the prefer method is subjective technique. There were up to 71 methods of subjective nutritional assessment for general patients and for specific patients such as liver disease, renal disease and geriatrics reported between the years 1982 - 2002.⁴ But these tests were not proved to be qualified. The most popular and well known technique is the SGA.⁵⁻⁹

However, we cannot conclude which method is the best nutritional assessment for every people. It depends on purposes of assessment and target population. For instance, nutritional status of people in the city or country is usually demonstrated in body mass index (BMI). Nutritional assessment for surgical patients should be associated with surgical outcomes, complications and hospital stay. Moreover, it will be better if the test is accurate, not too time-consuming and easy to use by any medical staff. In this study, BNT was the test adapted to suit surgical patients, simple, with the benefit of Thai language. Sensitivity and specificity of BNT score ≥ 4 is acceptable for detecting malnutrition in surgical patients.

Incidence of malnutrition in hospitals of other countries was around 40-50%. For example, it was 47% in Argentina and increased with duration of hospital stay.¹⁰ In Brazil, the incidence was 48.1%, which was severe malnutrition in 12.5%¹¹ similar to some studies from India, Cuba, and Latin America.¹²⁻¹⁴ The incidence of malnutrition in Vajira Hospital was quite high and not different from those studies. Early detection is necessary to prevent progressive malnutrition, to improve postoperative outcome and to decrease complications of these patients.

CONCLUSION

Bhumibol nutritional screening tool is a simple and effective screening tool for detecting malnutrition in surgical patients.

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