

PREOPERATIVE CLINICAL, SUBCLINICAL CHARACTERISTICS AND NUTRITIONAL STATUS OF GASTRIC CANCER PATIENTS AT VIETNAM NATIONAL CANCER HOSPITAL

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Gastric cancer ranked fourth for incidence and mortality of all cancers in Vietnam. Clinical symptoms in the early stages are often nonspecific. Patients may have epigastric pain, anorexia or weight loss. Gastroscopy combined with biopsy is a clinical test that helps diagnose gastric cancer. Endoscopic ultrasound, computed tomography of the abdomen and chest are important examinations to assess the stage of the disease. Gastric cancer patients had a high rate of malnutrition, and preoperative nutritional management represents a challenge. Cross-sectional descriptive research was conducted on 88 gastric cancer patients aged over 18 years old to describe preoperative clinical, subclinical characteristics and nutritional status at National Cancer Hospital from January to December 2023. Epigastric pain was the most common clinical symptom with 92%, ulceration type was the most common macroscopic type with 63.9%, poorly differentiated adenocarcinoma was the most common histopathological type with 43.2%, 53.4% of anemic patients. The preoperative malnutrition rate according to albumin, BMI and PG-SGA were 34.1%, 29.5% and 55.7% respectively. Research shows that some preoperative clinical and paraclinical characteristics were very typical of a gastric cancer patient. A very high rate of malnutrition was found in gastric patients before surgery.

Keywords: Preoperative malnutrition, gastric cancer, nutrition status, preoperative clinical, subclinical.

I. INTRODUCTION

Gastric cancer (GC) is a relevant public health issue as its incidence and mortality rates are growing worldwide.¹ According to the GLOBOCAN in 2020, it ranked as the fifth most common malignancy and the fourth leading cause of cancer death in both sexes worldwide.² At the same time, in Vietnam, GC ranked fourth for incidence and mortality of all cancers.² In addition, patients with GC had a high rate of malnutrition, and preoperative nutritional management represents a challenge.³

Clinical symptoms of GC are often nonspecific, easily confused with symptoms of benign disease. When clinical symptoms are typical, the disease is often at a late stage. According to some authors, epigastric pain was the most common symptom and reason in GC patients, ranging from 70 % to 97.2%, followed by anorexia and weight loss, ranging from 36.1% to 72.2%.⁴⁻⁶ Endoscopy of the upper gastrointestinal tract was a safe and accurate method for detecting GC. Through endoscopy, biopsy of suspicious lesions could be performed for a histological diagnosis and the endoscopy could classify morphologically advanced or early GC.⁷ Endoscopic ultrasound was the choice for local regional staging of gastric carcinoma. It helped to assess the

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degree of the local invasive cancer of stomach wall, metastatic status of the regional lymph nodes and invasive to the adjacent organs.⁸ Computed tomography had become one of the most ordered tests for GC staging. It was used to detect distant metastasis, direct invasion of surrounding structures and spread of tumor to the lymph nodes.⁹

Nutritional status could be defined as a set of structural characteristics, biochemical indicators and functional characteristics of the body that reflect the level of meeting nutritional needs. It was the result of eating and using nutrients in the body, reflecting the extent to which the body satisfies physiological needs for nutrients.¹⁰ There are many methods to assess nutritional status such as body mass index (BMI), Patient Generated Subjective Global Assessment (PG-SGA) or assess nutritional status through biochemical indices such as serum albumin or hemoglobin.¹⁰ At the Tokyo University Hospital, Japan in 2020, the malnutrition status of GC patients was 43.4% preoperatively and 39.2% postoperatively.¹¹ At the same time, the study at Zhongshan University Hospital, China also showed 31.8% of GC patients with malnutrition, of which 30.8% and 12.4% of patients received a single nutritional transfusion and total parenteral nutrition, respectively.¹² GC patients with preoperative malnutrition had an increased risk of poorer clinical outcomes: Higher postoperative complication rates such as infection (5 - 25%), increased treatment cost (more than 25%), longer hospital stays (8 - 15 days), increase mortality, thereby reducing quality of life, response to treatment and prognosis.^{11,12}

Assessing preoperative characteristics of gastric cancer patients is important for choosing treatment strategies and disease prognosis. Therefore, we conducted this study to describe

the clinical, paraclinical characteristics, and preoperative nutritional status of gastric cancer patients at Vietnam National Cancer Hospital.

II. MATERIALS AND METHODS

1. Subjects

88 patients were diagnosed with gastric cancer at Vietnam National Cancer Hospital from January to December 2023.

Inclusion criteria

Patients over 18 years old, diagnosed with gastric cancer; Patients were alert, good contact, and no cognitive disturbances; Patients were fully explained and voluntarily participated in the study.

Exclusion criteria

Patients had defects affecting the anthropometric index such as kyphosis, scoliosis, loss of limbs, inability to stand...; Disabled Patients, unable to provide information and data; Patients had an incomplete medical record.

2. Methods

Research design

Cross-sectional descriptive study.

Sample selection method

Convenience sampling was purposefully selected for all subjects that met the inclusion and exclusion criteria.

Research variables/indicators

Objective 1: Preoperative clinical and subclinical characteristics: age; gender; ethnicity; chief complaint on admission; signs; symptoms; personal history; family history; stomach endoscopy; endoscopic biopsy results; stage assessment.

Objective 2: Preoperative nutritional status: weight; height; BMI; lose weight within 1 month before surgery; weight loss within 6 months before surgery; blood count test; serum albumin; nutritional status according to PG –

SGA (A-B-C).

Data collection and analysis

We collected patients by designing questionnaires. The process of data analysis was done by using SPSS software version 22.0.

- Prepared a set of self-completed questionnaires on paper, distributed to each research subject a set of questionnaires to collect data.

- Collected anthropometric information:

- Height measurement: Measured standing height with a SECA synthetic plastic ruler. The ruler was placed vertically, perpendicular to the horizontal floor. Height was recorded in centimeters and gave as an odd number after the comma.

- Weight measurement: Measured weight on the morning of the patient's surgery and on the 8th day after surgery by TANITA BC-54. The patient wore the neatest clothes, stood in the middle of the table, did not move, eyes looked straight, weight was evenly distributed on both legs. Results were recorded in kg with an odd number.

- Collected test indicators: Collected test indicators from the patient's medical records. Indicators were recorded carefully, accurate to 01 decimal place.

Some assessment standards

- Serum albumin: Normal: 35 - 48 g/L; Mild malnutrition: 28 - <35 g/L; Moderate malnutrition: 21 - <28 g/dL; Severe malnutrition: < 21 g/dL.

- Hemoglobin: Anemia < 130 g/l for men and < 120 g/l for women.

- Body Mass Index (BMI): Chronic energy deficiency (CED): < 18.5; Normal: 18.5 - 22.99; Overweight: 23 - 24.9; Obesity: ≥ 25.

- PG-SGA assessment of the cancer patient's malnutrition risk was classified into 3 levels:

- PG-SGAA (Well-nourished): Stable weight

or recent weight gain, no reduction in dietary intake or recently improved, no abnormalities in functions and activities in the past a month.

- PG-SGA B (Moderate or suspected malnutrition): Weight loss < 5% in a month or 10% in 6 months, reduced dietary consumption; presence of symptoms affecting nutrition: moderate functional impairment: loss of subcutaneous layer or moderate muscle mass.

- PG-SGA C (Severely malnourished): Weight loss > 5% in a month or > 10% in 6 months, severe lack of dietary intake, presence of symptoms affecting eating; severe functional impairment or sudden deterioration with clear signs of malnutrition (loss of subcutaneous layer, muscle atrophy...).

Possible errors and control measures

Possible errors: Errors due to crawling tools; Error due to the investigator and the research subject not clearly understanding the question; Error due to missing/omission of information.

Error control measures: Trial survey and adjustment of collection tools before formal investigation; The investigator thoroughly understood the questionnaire and guided the research subjects to complete the questionnaire; Checked and screened the data immediately after collecting the questionnaire; Randomly checked the data of 10% of the sample forms error due to data input.

3. Research ethics

The subjects were informed of the purpose of the research, study only conducted when patients consented to participate in the research. Subject information would be kept completely confidential. Research results were for research purposes only. Research was only for the purpose of proposing measures to improve the patient's health and had no other purpose. Ensured the truthfulness of information.

III. RESULTS

General characteristic

The average age of patients was 60.4 ± 12.0 years old, of which the ≥ 60 years old group accounts for the highest rate (56.8%). There are only 5 patients under 40 years old, accounting for 5.7%. Males represented 69%, male/female

ratio = 2.23/1.

Among 88 patients, 64.8% of patients had no underlying comorbidities, 2 times higher than patients with comorbidities (35%). Most patients have healthy family history, accounting for 96.6% while 3.4% of patients have GC family history.

Clinical and subclinical

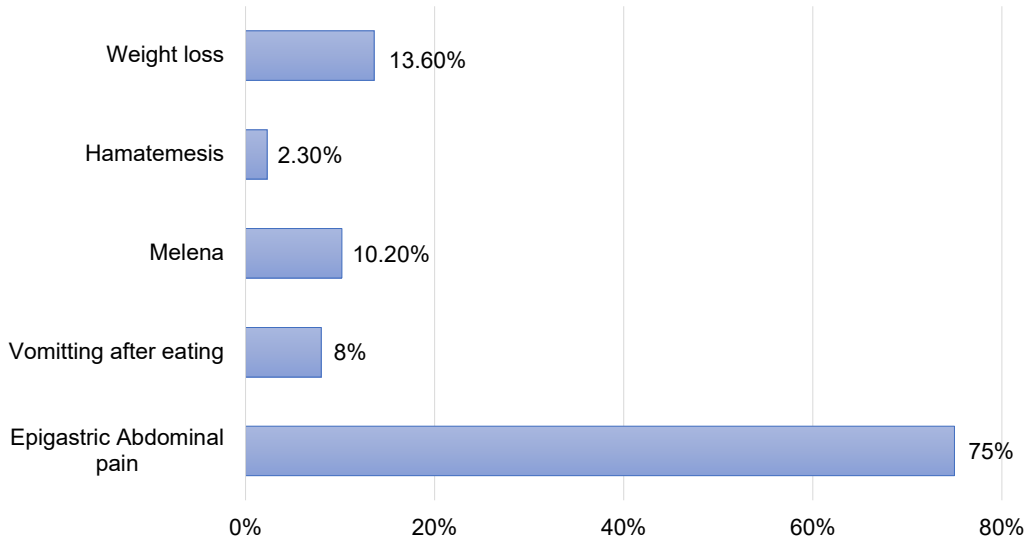


Chart 1. Chief complaint on admission

The most common chief complaint on admission is epigastric pain, accounting for 75%.

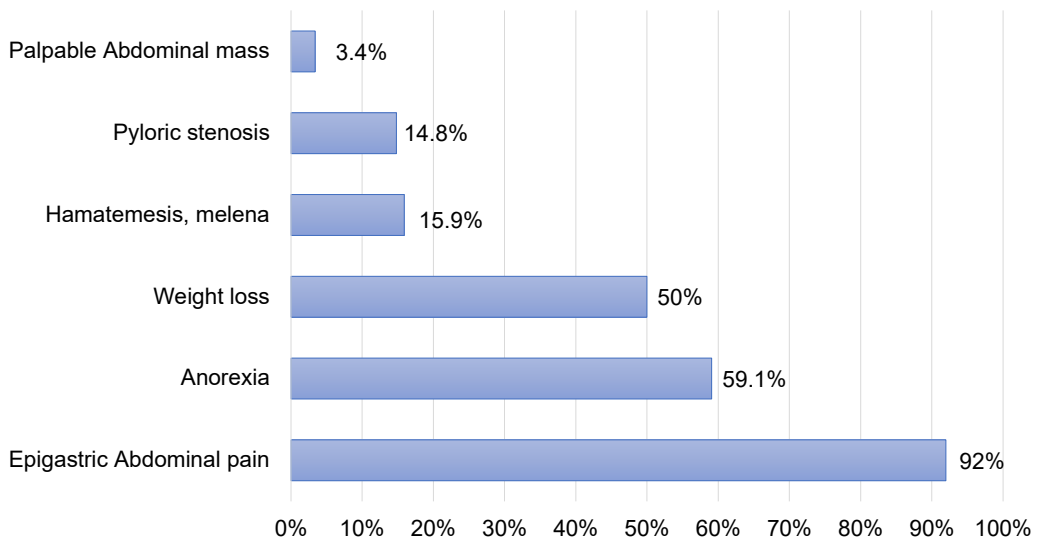


Chart 2. Common clinical symptom

The most common clinical symptom is epigastric pain, accounting for 92%. Anorexia accounts for 59.1%, weight loss accounts for 50%. Symptoms of pyloric stenosis,

gastrointestinal bleeding, and palpable abdominal mass are 14.8%, 15.9%, and 3.4%, respectively.

Table 1. Characteristics of gastric endoscopy

Information	Classification	(n)	(%)
Tumor location	Proximal segment (Cardia - Fundus)	6	6.8
	Middle segment (Body)	18	20.5
	Distal segment (Pyloric antrum)	62	70.5
	Spread	2	2.3
Macroscopic type	Mass	13	14.8
	Ulcerative	61	69.3
	Infiltrative ulcerative	12	13.6
	Diffuse infiltrative	2	2.3
Pyloric stenosis	Yes	17	29.3
	No	71	80.7
Total		88	100

Most patients have tumors in pyloric antrum with 70.5%, 20.5% and 6.8% of tumors in the middle and proximal segment. The most common macroscopic type is ulcerative type

with 69.3%; mass, infiltrative ulcerative, and diffuse infiltrative type are 14.8%, 13.6% and 2% respectively. 29.3% of patients have pyloric stenosis.

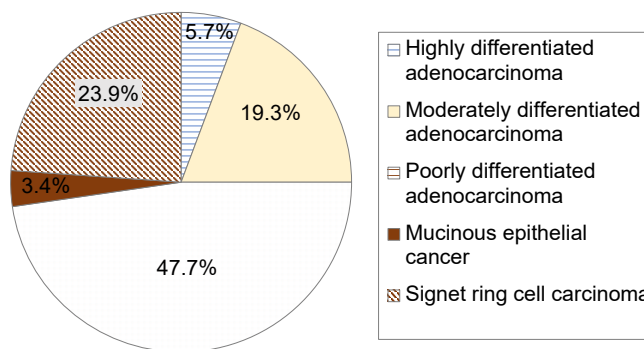


Chart 3. Pathological results of preoperative biopsy

Poorly differentiated adenocarcinoma is the most common pathology representing 47.7% (Chart 3).

GC stages II and III are the most common,

accounting for 60.2% and 27.3% respectively. GC stages I and IV are 8% and 4.5% respectively (Chart 4).

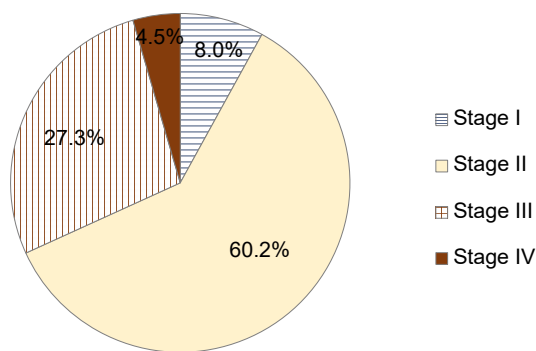


Chart 4. Classification of disease stage before surgery

3. Nutritional status

Table 2. Preoperative nutritional status according to BMI (Asia)

BMI	Level (kg/m ²)	Frequency (n)	Percentage (%)
CED	< 18.5	26	29.5
Normal	18.5 - 22.9	54	61.4
Overweight	23 - 24.9	3	3.4
Obesity	≥ 25.0	5	5.7
Total		88	100

29.5% of patients have chronic energy deficiency, 3.4% and 5.7% of patients are overweight and obese.

Table 3. Preoperative malnutrition according to albumin, anemia status

Level	Albumin (g/l)	Frequency (n)	Percentage (%)
Normal	≥ 35	58	65.9
Malnutrition	< 35	30	34.1
Level	Hgb (g/l)	Frequency (n)	Percentage (%)
<i>No anemia</i>	Male ≥ 130	41	46.6
	Female ≥ 120		
<i>Anemia</i>	Male < 130	47	53.4
	Female < 120		
Total		88	100

Anemia status before surgery according to WHO: 46.6% of non-anemia and 53.4% of anemia patients. Preoperative malnutrition

according to albumin: 65.9% of patients have good nutrition, 34.1% of patients have malnutrition.

Table 4. Preoperative nutritional status according to PG-SGA

PG-SGA	Frequency (n)	Percentage (%)
PG-SGA A (Well-nourished)	39	44.3
PG-SGA B (Moderate or suspected malnutrition)	35	39.8
PG-SGA C (Severely malnourished)	14	15.9
Total	88	100

44.3% of patients are well-nourished, 55.7% of patients are malnourished, including moderate/suspected malnourished and severely malnourished are 39.8% and 15.9% respectively.

IV. DISCUSSION

General characteristic

The research was conducted on 88 GC patients with male patients represented the majority at 69%, 2.23 times higher than female. This result is comparable with Phan Thi Dieu Ngoc's results in 2022 with 60.8% of men male nearly 2 times higher female.¹³ This is consistent with WHO's data in 2020, Vietnam had 2 to 3 times higher rate of GC in men than women.² Furthermore, most other studies in the world reported that incidence of GC in men was higher than women from 1.5/1 to 2.5/1.⁵ This may be because men are exposed to more risk factors for GC such as smoking and drinking alcohol.

The average age of patients was 60.4 ± 12.0 years old, of which the ≥ 60 years old group accounts for the highest rate (56.8%), nearly 10 times higher than the 18 - 39 years old group (5.7%). Phan Thi Dieu Ngoc's research in 2022 also showed an average age of 61.77 ± 1.007 ; the highest rate ≥ 60 years old was 58.3%.¹³ As people get older, with the decline of the physiological functions and the body's compensatory ability, the probability of suffering from chronic cancer disease is quite high.

This study shows that 35.2% of patients had comorbidities. Cardiovascular disease was the most common problem with 22.7% hypertension, 4.5% coronary artery disease and 1.1% of stroke. Hypertension is a risk factor for cardiovascular events, stroke, bleeding and death after surgery. Therefore, stable control of blood pressure before, during and after surgery is very important. Besides, up to 17% of patients also had diabetes. Studies on the rate of preoperative GC patients with diabetes from 10 to 25% and were mainly found in the elderly.^{4,5}

Clinical and subclinical

Among 88 research subjects, epigastric pain was the most common clinical symptom in 92% of patients; upon admission, epigastric pain was also the most common chief complaint of 75% patients. Patients complained of dull, persistent abdominal pain in the epigastric area, unrelated to meals, for many days and months; the condition was detected by a stomach endoscopy. Other symptoms in domestic studies, epigastric pain was also the most common symptom with rate from 78.3% to 92.8%.^{5,14} While epigastric pain are atypical symptoms, it could also be found in other benign diseases such as gastroduodenal inflammation, gastroesophageal reflux, hepatobiliary disease... However, it is very common in GC which should prompt clinician to screen for the disease. The next most common symptoms of

GC were anorexia and weight loss with rates of 59.1% and 50% respectively. These symptoms are non-specific and occur in many other medical conditions, especially in the elderly. Loss of appetite is common even when there is no other medical condition. Therefore, many people subjectively delay health examination. Pham The Duong in 2019 also reported that anorexia and weight loss represented 51.4% of GC patients.¹⁴ Stomach tumors cause disorders in the absorption and metabolism of nutrients, and combine many other problems associated with GC such as abdominal pain, anemia, and psychological problems, leading to fatigue, loss of appetite and weight loss. Palpable abdominal mass and pyloric stenosis are signs suggesting advanced GC. Among 88 GC patients, 3 cases (3.4%) had palpable abdominal mass, and 17 cases (29.3%) had pyloric stenosis. The rate of pyloric stenosis ranged from 14.4 - 30%, as in Pham The Duong's research in 2019 was 14.4%.¹⁴ Pyloric stenosis is a delayed emergency in GC. Patients often have systemic signs of dehydration, electrolyte disorders, weight loss due to fear of eating, and malabsorption. Therefore, correcting water & electrolyte disorders and ensuring preoperative nutrition is extremely important.

In this study, 100% of cases underwent gastric endoscopy and biopsy before surgery. This is an important method to determine the tumor location and diagnosis of GC. Most patients had tumors in pyloric antrum, accounting for 70.5%, tumors in the body, cardia-fundus, spreading throughout the stomach were 20.5%, 6.8%, and 2.3%, respectively. The most common macroscopic types were ulcerative type with 69.3%, followed by mass type with 14.8%, ulcerative infiltrative and diffuse infiltrative type with 13.6% and 2.3%. Comparing the results of Pham The Duong in 2019, ulcerative type was

the most common with 54.1%, mass type was 30.6%.¹⁴ Thus, the rate of macroscopic types varies according to studies, but most of them show that ulcerative and mass type are still the most common. Preoperative biopsy results also showed that poorly differentiated carcinoma was the most common, accounting for 47.7%.

Accurately diagnosing the preoperative stage of the disease is very important in planning treatment as well as providing a surgical strategy. Diagnose disease stage by assessing tumor invasion (T), lymph node metastasis (N) and metastasis to abdominal organs (M). However, with early-stage gastric cancer lesions, distinguishing between T1a, T1b, and T2 tumors on computed tomography is very difficult because this stage often does not show clear gastric wall thickening on X-rays. The study results showed that most patients were diagnosed with stage II and III, accounting for 60.2% and 27.3% respectively. Stages I and IV were 8% and 4.5% respectively. Gastric cancer is a disease that progresses silently, with often atypical and faint symptoms, thus when the patient decides to seek treatment, the condition is already severe causing discomfort, and the disease is often in the late stages.

Nutritional status

Assessing nutritional status based on BMI is quite simple, easy to perform, and inexpensive. BMI is an important predictor of mortality in hospitalized patients. The advantage of this method is that it uses both height and weight, so it is more suitable to reflect appropriate weight for height. However, this method is not used to detect short-term or specific nutrient deficiencies. According to this study results, the rate of malnutrition patients according to BMI before surgery was 29.5%, 61.4% of patients had normal nutritional status, and 9.1% of patients were overweight or obese. This result

is higher than the results of other studies such as Nguyen Thi Hang in 2022 with 16.7%.¹⁵ It may be due to different research locations, especially Vietnam National Cancer Hospital, which specializes in cancer treatment. In addition, the rates of malnutrition in women and men according to BMI were 29.6% and 29.5%, respectively. Malnutrition is also higher at older ages and in late-stage cancer patients. Thus, BMI does not reflect changes in nutritional status in a short time, so it needs to be combined with many other methods of assessing nutritional status.

Hemoglobin is a protein made up of globin that contains iron. Anemia is a decrease in the number of red blood cells or a decrease in hemoglobin content in peripheral blood, leading to a lack of oxygen in the blood to supply tissues. If there is a lack of iron in the diet or poor absorption of iron, it will lead to iron deficiency anemia. Anemic patients are often tired, dizzy, has reduced movement, lost appetite, thus increasing the risk of complications and death. The rate of anemic patients before surgery was 53.5%, of which mild, moderate and severe anemia were 33%, 18.2%, and 2.3%, respectively. GC patients have a high rate of anemia. Therefore, recommending a diet full of iron, especially absorbable iron such as heme iron found in foods of animal origin, is extremely necessary in these patient groups. The results showed that preoperative albumin concentration was 37.7 ± 5.5 g/l; in which the average albumin for men was 37.7 ± 5.6 g/l, for women was 37.6 ± 5.4 g/l and 34.1% of GC patients were malnourished before surgery based on albumin level.

PG-SGA is developed based on SGA to assess nutritional status for GC patients with high sensitivity and specificity and is widely used in clinical practice. PG-SGA is a more

specific method for assessing nutritional status for cancer patients. For example, assessing symptoms of nausea, vomiting, diarrhea, dry mouth and taste changes. This is a subjective global assessment performed on all aspects including: weight loss, decreased food digestion, activity and function, increased metabolic demands (fever, corticosteroid use) and physical examination (including assessment of muscle atrophy, loss of subcutaneous fat, and edema and ascites). This study of nutritional status assessment according to PG-SGA show that the rate of patients at malnourished was 55.7%; of which moderate malnutrition was 39.8%, severely malnourished was 15.9%, the risk of malnutrition in men was 59%, higher than in women with 48.1%. Our result is in line with other findings on the nutritional status of gastric cancer patients before surgery.^{13,15}

The limitation of the study

This is a cross-sectional descriptive study, conducted over a short period of time, and the sample size is not large. Therefore, the study results cannot reflect comprehensively, completely and in detail the nutritional status of gastric cancer patients before surgery.

V. CONCLUSION

Research shows that some preoperative clinical and paraclinical characteristics were very typical of a gastric cancer patient. A very high rate of malnutrition was found in GC patients before surgery. It is recommended to have good strategies and methods to support the improvement of the nutritional status for this patient group.

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