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A SUBJECTIVE GLOBAL ASSESSMENT OF NUTRITIONAL STATUS: A STUDY OF 1400 SURGICAL PATIENTS

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Purpose: The aim of this study was to evaluate the nutritional status of patients hospitalized in a surgical department and to assess the contribution of nutritional support to patients with malnutrition.

Materials and Methods: A Subjective Global Assessment (SGA) was performed in 1400 patients (1229 benign and 171 malignant cases) at admission. Two patients with breast carcinoma and 121 patients with GIS malignancies had nutritional support by way of enteral, parenteral, or combined enteral and parenteral nutrition. Urinary nitrogen excretion was used for the clinical evaluation of the patients who received nutritional support. Nutritional support was started 3-5 days prior to surgery. Most of the patients received early enteral nutritional support orally or by way of nasoenteral or jejunostomy tubes, postoperatively. The duration of nutritional support was approximately 10 days. In the group of patients who received nutritional support, the nutritional status on discharge was compared with that at admission.

Results: Of the 1229 benign cases, 1187 (96.4%) were classified in group A and 42 (3.6%) were classified in group B. None of them received nutritional support. Of the 50 patients with endocrine malignancies, only the two breast carcinoma patients who scored C received nutritional support. A preoperative evaluation of the 121 patients with GI malignancies revealed that 33 (27.3%) scored A, 63 (52%) B, and 25 (20.7%) C. Nutritional support was given to all patients with GI malignancies, regardless of the nutritional status. When the 123 patients who received nutritional support were discharged, 68 of them (55.3%) were in the same group, 4 (3.3%) had deteriorated to a lower group, and 51 (41.4%) had risen to an upper group. No hospital mortality was observed in the study group.

Conclusion: The results indicated that 3.6% of the surgical patients with benign and 53.8% of those with malignant diseases were malnourished to various degrees, preoperatively. Using the SGA and with a standardized strategy of nutritional support, it is possible to provide better nutritional levels or to maintain the preoperative nutritional status in patients undergoing surgery.

Key Words: Nutritional Support, Nutritional Assessment, Malnutrition, Subjective Global Assessment, Cancer.

SUBJEKTIF GLOBAL DEĞERLENDIRME INDEKSI ILE 1400 CERRAHI HASTANIN NUTRISYONEL DURUMUNUN DEĞERLENDIRILMESI

Amaç: Bu çalışma Genel Cerrahi Kliniği'ne yatan hastaların beslenme durumlarını ve malnutrisyonu olanlara beslenme desteği vermenin etkinliğini değerlendirmek için yapıldı.

Hastalar ve Yöntemi: Subjektif Global Değerlendirme İndeksi (SGDİ) 1400 hastaya (1229 benign, 171 malign) hastaneye yatış sırasında uygulandı. İki meme kanserli ve 121 gastrointestinal sistem (GIS) kanserli hastaya enteral, parenteral veya enteral ve parenteral kombine yolla nutrisyonel destek verildi. Beslenme desteği alan hastalar nitrojen dengesi değeriyle takip edildi. Beslenme desteği operasyondan 3-5 gün önce başlandı. Birçok hastaya oral, nazoenteral veya jejunostomi yoluyla erken enteral beslenme başlandı. Beslenme desteği ortalama 10 gün sürdü. Beslenme desteği alan hastalar taburculuğu sırasında SGDİ ile tekrar değerlendirildi.

Bulgular: 1229 benign hastanın, 1187'si (%96.4) A grubunda, 42'si de (%3.6) B grubunda idi. Bu hastalardan hiçbirine nutrisyonel destek yapılmadı. 50 endokrin sistem maligniteli hastadan sadece ikisi meme karsinomalı hasta C grubunda idi ve bu hastalara da enteral nutrisyonel destek yapıldı. Operasyon öncesinde 121 GIS kanserli hastanın 33'ü (%27.3) A grubu, 63'ü (%52) B grubu ve 25'i (%20.7) de C grubunda idi. Beslenme durumuna bakılmaksızın tüm GIS kanserli hastalara beslenme desteği verildi. Beslenme desteği alan hastalar taburculuğu sırasında 68'i (%55.3) aynı grupta, 4'ü (%3.3) bir alt grupta ve 51'i (%41.4) da bir üst grupta idi. Bu çalışmada hastane mortalitesi olmadı.

Sonuç: Sonuç olarak benign bir hastalık nedeniyle başvuran hastaların %3.6'sı, malign bir sebeple başvuranlarında %53.8'i değişik derecelerde malnütre idi. SGDİ ile değerlendilerek verilen standart bir nutrisyonel destekle ameliyat olacak hastalarda preoperatif beslenme durumu bir üst seviyeye çıkarılabilir veya en azından korunabilir.

Anahtar Kelimeler: Beslenme Desteği, Beslenme Değerlendirmesi, Malnutrisyon, Subjektif Global Değerlendirme İndeksi, Kanser.

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The prevalence of malnutrition in hospitalized patients is about 30-50%, and it is well known that malnutrition increases operative morbidity and mortality (1-4). In patients with malignant diseases, the ratio of malnutrition is higher than that in patients with benign disorders (5). In one study, 40% of patients with malignant diseases were malnourished at the time of presentation before medical or surgical treatment (5). The percentage of malnutrition increases with surgery, chemotherapy and/or radiotherapy (6). The nutritional care of cancer patients should always be considered supportive, whether the oncological aim is cure or palliation. The goals of nutritional care are to support nutritional status, body composition, functional status, and quality of life (7).

Several measurements have been used for evaluating the nutritional status of hospitalized patients, such as anthropometric data, skin testing for cutaneous delayed hypersensitivity, levels of plasma secretory proteins, or urinary nitrogen and creatinine excretion (8-11). Another valid instrument, utilizing the combination of medical history, physical examination and various parameters based on clinical criteria, is called the subjective global assessment (SGA)(Table 1). Developed by Detsky and coworkers (11), the SGA is easy to use and practical, and thus is widely used in many institutions (12). It is a tool that formalizes and quantifies a clinical impression formed from measurements of functional capacity as an indicator of malnutrition or malnutrition-inducing conditions, combining aspects of the patient's history, physical examination and the physician's impression (13).

In this study, we evaluated with the SGA the nutritional status of 1400 patients at admission in a surgical department. In the group of patients who received nutritional support, the nutritional status on discharge was compared with that at admission. Severely malnourished patients and all of the patients with gastrointestinal (GI) malignancies, regardless of the nutritional status, received enteral, parenteral, or combined enteral and parenteral nutritional support.

PATIENTS AND METHODS

This prospective study included 1400 well-documented patients admitted to our General Surgery Department from July 1999 to January 2001. Trauma cases and patients with inflammatory bowel diseases were excluded because of their incomplete data in other departments pre- or postoperatively. The patients were evaluated and classified as well-nourished (A), moderately malnourished (B), or severely malnourished (C) according to the SGA. The Harris-Benedict equation was used for calculating the amount of nutritional support. The amino acid compositions and carbohydrate-lipid ratios, as well as the volumes, were determined according to the liver, kidney and cardiopulmonary functions, and the risk

factors of the patients (lipid, carbohydrate and protein ratios arranged according to the patients' risk factors, these data not discussed). Patients in group C according to the SGA and all of the patients with GIS malignancy received nutritional support. Patients who underwent surgery received nutritional support until they fed orally sufficiently. Other patients (inoperable) had nutritional support until they were discharged. Only two patients with breast carcinoma and six with rectal carcinoma received neoadjuvant chemo- or radiotherapy. Two patients in group C with breast carcinoma and all patients with GIS malignancies had nutritional support by way of enteral, parenteral, or combined enteral and parenteral nutrition. Twenty-one patients received enteral nutrition, 37 parenteral nutrition and 65 combined enteral and parenteral nutrition. Urinary nitrogen excretion was used for the clinical evaluation of the patients who received nutritional support. Nutritional support was started 3-5 days prior to surgery. Most of the patients received early enteral nutritional support orally or by way of nasoenteral or jejunostomy routes, postoperatively. The median duration of nutritional support was 10 days (range 7-16 days).

RESULTS

The age and sex distributions of the 1400 patients are shown in Table 2.

Table 1: Features of Subjective Global Assessment (SGA).

History
- Weight change
  - Loss in past 6 months
    - Amount in kilograms
    - Percentage loss
  - Increase, decrease or no change in past 2-4 weeks
- Dietary change
  - Duration of change (in weeks)
  - Type of change (low intake, liquids only, starvation)
- Gastrointestinal symptoms
  - Nausea, vomiting, diarrhea, anorexia
- Functional impairment
  - Work capacity (normal, suboptimal, bedridden)
  - Duration of dysfunction
- Disease and nutritional requirements
  - Primary diagnosis
  - Concurrent diagnosis
  - Stress level (none, low, moderate, high)

Physical examination (mild, moderate or severe ratings given for each category)
- Loss of subcutaneous fat
- Muscle wasting (quadriceps, deltoid)
- Facial wasting (temporal, submandibular)
- Ankle edema
- Scrotal edema
- Ascites

SGA rating:
- A= Well nourished
- B=Moderately malnourished
- C= Severely malnourished

Table 2: Distribution of the patients with benign or various malignant disorders related to age and female/male ratio.

Ages	< 50	> 50	Total	Female/ male
Benign	876	353	1229	1.36
Breast carcinoma	10	30	40	Inf.
Thyroid carcinoma	5	5	10	1
Gastric carcinoma	8	34	42	2.50
Colon carcinoma	9	60	69	
Pancreas carcinoma	4	6	10	4

The number of patients admitted for benign diseases was 1229 (87.8%). Of these 1229 benign cases, 1187 (96.4%) were classified in group A and 42 (3.6%) in group B, according to the SGA. None of these patients received nutritional support because they were not severely malnourished and their oral intake was not interrupted for more than two days.

Of the 50 patients with endocrine malignancies, 46 (92%) were classified in group A, 2 (4%) in group B, and 2 (4%) in group C. Only the two breast carcinoma patients who scored C received nutritional support. A preoperative evaluation of the 121 patients with GI malignancies revealed that 33 (27.3%) scored A, 63 (52%) B, and 25 (20.7%) C (Table 3). Nutritional support was given to all patients with GI malignancies, regardless of the nutritional status.

Table 3: Distribution of the groups related to the nutritional status according to the SGA.

Group A	Group B	Group C	Total	
Benign	1187	42	-	1229
GIS malignancy	33	63	25	121
Endocrine malignancy	46	2	2	50
Total	1266	107	27	1400

Therefore, of the 1400 patients studied, 123 (8.8%) received nutritional support. A positive nitrogen balance was obtained in all patients within 3-5 days, after which surgery was performed. When the patients who received nutritional support were discharged, 68 of them (55.3%) were in the same group, 4 (3.3%) had deteriorated to a lower group, and 51 (41.4%) had risen to an upper group (Table 4). No hospital mortality was observed in the study group. We observed six wound infections and one anastomotic leakage. Four patients out of 86 who received enteral nutrition (4.7%) developed abdominal distention, vomiting and/or diarrhea. We had to stop enteral nutrition in a single patient due to uncontrollable diarr-

hea, while enteral nutrition could be continued in the rest with reduced amounts.

Table 4: Changes in the nutritional status of patient groups after nutritional support (on discharge), compared with the corresponding levels at admission.

Changes in groups	Rose to an upper group	Deteriorated to a lower group	Stayed in the same group
Gastric carcinoma	17 (40.47%)	4 (9.53%)	21 (50%)
Colorectal carcinoma	30 (43.47%)	0	39 (56.53%)
Pancreas carcinoma	2 (20%)	0	8 (80%)
Breast carcinoma	2 (100%)	0	0
Total	51 (41.4%)	4 (3.3%)	68 (55.3%)

DISCUSSION

The results of this large series of surgical patients from a single department showed that 3.6% of the patients with benign and 53.8% of those with malignant diseases were malnourished to various degrees, according to the SGA. The 3.6% rate of malnutrition in our group of benign cases is lower than those reported in the literature (1-4). The possible reasons for this finding may be that most of these patients were under the age of 50 and that they represented a rather higher socioeconomic status, having sought treatment at a university hospital. On the other hand, the prevalence of preoperative malnutrition in our group of malignant cases (8% of the patients with endocrine and 72.7% of those with GI malignancies) is similar to the findings reported in other studies (14-16). A decline in the nutritional status is seen in most cancer patients, with the prevalence of weight loss and malnutrition ranging from 9% to 80% (14-16). The etiology of malnutrition in cancer patients is multifactorial (17). Malnutrition can result from the systemic effects of the tumor and/or the side effects of anticancer treatment (18,19). Systemic effects, such as anorexia and altered metabolism together with cachexia, are multiple, and they differ in type and severity depending on the form of cancer. Local effects are usually associated with malabsorption, obstruction, diarrhea, or vomiting. As exemplified in this study, patients with GI malignancies or cancer of the lung or esophagus are at greater risk of weight loss, whereas patients with breast cancer, leukemia, sarcoma, or lymphoma have a lower risk (20).

The first important step in evaluating and manipulating nutrition is a standardized and valid method for assessing nutritional status. For example, anthropometric measurements, such as skinfold thickness, midarm circumference or body mass index, measure body composition, but they only indirectly assess the nutritional status (21). The SGA is a practical tool that formalizes and quantifies a clinical impression formed from measurements of functional capacity as an indicator of malnutrition or malnutrition-inducing conditions, combining aspects of the patient's history and physical examination and the physician's impression (13). In one study investigating the nutritional status of 46 patients, an objective method (utilizing anthropometric data, skin testing for cutaneous delayed hypersensitivity and levels of plasma secretory proteins) of nutritional status was compared with the SGA (22). It was found that 28 patients were characterized as malnourished according to the objective method, and 30 patients according to the SGA. The correlation of these methods was high, and the validation test of the SGA resulted in a sensitivity of 96% and specificity of 83%. Similarly, when the SGA scores were compared with those of other objective measures of nutritional status, the SGA was confirmed to be a valid test (22). In this study, the SGA was used in a large series of surgical patients in order to improve the nutritional strategy. Although the SGA scores were not compared with other measurements, the remarkable results of nutritional improvement confirmed the validity of this method.

Another important feature of this study is that the levels of nutritional status on discharge were compared with their corresponding levels at admission. We evaluated the effect of nutritional support in this way, because we did not have a control group of patients who received no nutritional support even though they needed it. To use a control group in this situation is not ethical because it is obligatory to give nutritional support to malnourished patients, especially those who also have malignancy. In addition to the above-mentioned negative effects of cancer on nutritional status, the stress response observed with surgery is also associated with hypermetabolism, tissue breakdown, and protein loss (23). These, in turn, lead to weight loss, fatigue, and deterioration in functional status (23). Postoperative weight loss results from increased energy expenditure due to the stress response and decreased dietary intake. In our study, all of the patients with GI malignancies and all of the others who scored C (severe malnutrition) according to the SGA received nutritional support. If you think you cannot feed patients orally for 7 days or more, you must give nutritional support. For patients with GI malignancies, it is our preference to start nutritional support preoperatively even if malnutrition does not exist at admission. This strategy is based on the fact that in this patient group adequate oral intake is usually delayed postoperatively, and a positive nitrogen balance is especially important because of the frequent existence of large incisions, risky anastomoses and/or infections. When the 123 patients who received nutritional support were discharged, 68 of them (55.3%) were in the same group, 4 (3.3%) had deteriorated to a lower group, and 51 (41.4%) had risen to an upper group. Therefore, with our simple and standardized nutritional evaluation and support, a decline in the nutritional status of cancer patients could be avoided in a majority of cases. Furthermore, almost half improved in spite of surgery. Although there was no control group, this nutritional advantage probably contributed to the zero mortality observed.

In conclusion, 3.6% of the surgical patients with benign

and 53.8% of those with malignant diseases were malnourished to various degrees, preoperatively. Using the SGA and with a standardized strategy of nutritional support, it is possible to provide better nutritional levels or to maintain the preoperative nutritional status in patients undergoing surgery.

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