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Methods of nutrition assessment in patients with head and neck cancer

Abstract

The head and neck tumors constitute large and complex group. The incidence of malnutrition in patients with head and neck tumors averages from 65 to 75%. That gives them the third place behind the pancreas and stomach tumors. The correct assessment of nutrition helps to recognize the degree of malnutrition and has influence on nutrition care and therapy. The dietary interview, anthropometric methods, bioimpedance and laboratory tests are used in evaluation of nutritional state in various scale. The degree of malnutrition has an influence on number of complications and extends the period of hospitalization, thus the methods evaluating the nutrition are commonly used in clinical practice. The objective of this article is to introduce the readers to the methods of nutrition assessment in patients with head and neck cancer.

Keywords: head and neck cancer, malnutrition, assessment of nutrition status.

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INTRODUCTION

The head and neck tumors constitute large and complex group. The incidence of malnutrition in patients with head and neck tumors averages from 65 to 75%. That gives them the third place behind the pancreas and stomach tumors [1]. The malnutrition is defined as a nutritional status in which deficiency of nutrients like proteins, fats, vitamins results in measurable effects on body form and its function [2]. The relationship between cancer and malnutrition has been established for a long time. The most susceptible to malnutrition are patients with head and neck, esophagus, stomach and pancreas tumors [3]. Malnutrition negatively influences the quality of life and the prognosis, affecting the response to the anticancer treatment and the survival.

Causes of malnutrition in patients with head and neck tumors

The causes of malnutrition are connected with lowered food intake. The tumors located in upper respiratory and alimentary tracts affect the will to consume the food. They create disturbances of chewing, swallowing, proper mastication, which occur in odynophagia, dysphagia and lead finally to cachexia [4]. Not only is the presence of the tumor connected with decreased nutritional state. In some cases, the surgical treatment of the tumor has an influence on narrowing of alimentary tract and can lead to similar disturbances. The known side effects of chemotherapy (nausea, vomits, inappropriate smell and taste, diarrhea) and radiotherapy (dysphagia, xerostomia, stenoses, fistulas) are also associated with malnutrition [5].

The methods used to evaluate the state of nutrition

One of the most popular methods in the assessment of nutrition is Body Mass Index (BMI). The measurement is simple and accessible. Malnutrition is defined by: $BMI \leq 18.5$ kg/m² between the ages of 18 and 75 years; $BMI \leq 21$ kg/m² after the age of 75 years; the patient is considered to be overweight when the BMI is between 25 and 30; the obesity is present when $BMI > 30$ [6]. The disadvantages are difficulties in measurement in oedemas and the fact that obesity does not provide the proof of appropriate nutrition.

The biometric measurements like waist to hip ratio (WHR), thickness of skin folds measured in particular sites of the body (over the biceps muscle, triceps muscle, under the scapula and over the hip), arm circumference, provide the data about the adipose tissue and muscle mass but have low accuracy.

Bioelectrical impedance analysis (BIA) is one of the methods for nutritional status assessment. BIA is noninvasive, inexpensive and portable method that has been used mainly for body-composition analysis over the years [7]. It measures body reactance (X_c), resistance (R) and phase angle (PA). The use of these parameters provides the data about the fat mass, free fat mass and the arrangement of water in the extra and intracellular compartment [8].

The Detsky index or subjective global assessment (SGA) is another method that was established on the basis of the clinical interview, assessing the degree of malnutrition with respect to the degree of weight loss, the severity of gastrointestinal and clinical signs malnutrition and functional and muscle changes. According to this classification,

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patients were classified as not malnourished, moderately malnourished, and severely malnourished. The classification based on this index therefore corresponded to the examiner's subjective assessment with no calculations or precise indications [9].

The biochemical markers, for example the albumin serum level, play an important role in the assessment of nutrition. It should be monitored every 3-4 days in patients with severe nutrition disorders. The correct level is 3.5 g/dl. Slight malnutrition is defined by albumin serum level between 3.0-3.5 g/dl, moderate malnutrition between 2.4-2.9 g/dl and severe malnutrition is present when albumin level is less than 2.4 g/dl. The decrease of albumin serum level to 2.5 g/dl is connected with increased mortality to 33%; and the decrease to 1.8 g/dl increases mortality to 65% [10]. One of the disadvantages is that the albumin level depends from the proper function of the kidneys and liver. It can change during the infections and traumas.

One of other biochemical markers is transferrin serum level. The correct transferrin serum level is between 200-400 mg/dl. Slight malnutrition is defined by transferrin serum level between 150-200 mg/dl, moderate malnutrition between 100-150 mg/dl and severe malnutrition is present when transferrin level is less than 100 mg/dl. The states like anemia, sideropenia, oestrogens, contraception, liver's and kidney's malfunctions can lead to abnormalities in transferrin serum level [11].

Total lymphocyte count (TLC) is also used to evaluate proper nutrition. It is accessible and simple test with high level of reproducibility. The malnutrition is characterized with TLC number less than 1700/mm³. Proliferative diseases in lymphoid and haemopoetic systems, chemotherapy, infections, cause that TLC is inaccurate to define malnutrition [12].

CONCLUSION

The significant loss of body mass is one of the primary symptoms that are present in patients with head and neck tumors. The main reason of malnutrition is the presence of the neoplasm in specific localization, tumor stage and side effects of its therapy. There are several methods, which provide the information about the nutrition of the neoplastic patients. Owing to these methods we can evaluate the nutritional state of the patient's body, provide required nutrition treatment decreasing the number of complications and cost of hospitalization.

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