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Clinical Gastronomy: An Ally for Taste and Smell Changes and Prevention of Malnutrition in Cancer Patients

Roberta de Lucena Ferretti[1]
1. University of Taubate, Department of Nursing and Nutrition
Taubate/SP-Brazil

Abstract:- Malnutrition in cancer patients is a common but unfavorable finding, due to deleterious consequences for the patient. More specifically and worryingly, loss of muscle mass often occurs in these patients, leading to impairment in the immune system, wound healing, delay in chemotherapy cycles, among others, affecting disease prognosis and patient's. Taste and smell alterations associated with malignancies treated using chemotherapy and the various interventions proffered to lessen alterations. Many drugs, including cancer chemotherapeutics are secreted in saliva and gain direct contact with taste-receptors. Patients usually experience metallic or "chemical" taste when chemotherapy is delivered, which is consistent with drug secretion in saliva. Howerver, food presentation can affect food intake and induce nutritional benefit. Improvement of meal presentation at a hospital setting can increase food intake, reduce waste food substantially and reduce readmission rate to hospital. Oral Nutritional Therapy plays a fundamental role, helping to prevent and treat malnutrition. However, the use of nutritional supplements is not always well accepted by patients, especially those who have changes in taste and even smell. Thus, several strategies have been implemented for the proper management of oral nutritional supplementation. It Is recognized for having followed the path of nutrition as a science, and currently, the fusion between nutrition, gastronomy and dietetic techniques is identified in the main health centers and hospitals, within a context called clinical gastronomy, which is a strong ally when it comes to precisely the humanized nutritional assistance. Some factors should also be considered in clinical gastronomy, such as the utensils used, portion sizes, texture, smell, temperature, and final presentation of the preparation. In conclusion, cancer can significantly affect taste sensation, either due to the disease itself or, more commonly, by effects of cancer therapies. Hospital food requires more than any other nutrition and dietetic collaboration with food and cooking since both should be directed towards the same end, the correct feeding of the patients admitted, in the most pleasant culinary way possible.

Keywords:- *Food Intake; Hospital catering; Hospital food; Hospital malnutrition; Meal presentation, Taste & Smell Alterations.*

I. INTRODUCTION

Malnutrition in cancer patients is a common but unfavorable finding, due to deleterious consequences for the patient. Patients with cancer are more likely to be malnourished than patients treated in many other specialties. More specifically and worryingly, loss of muscle mass often occurs in these patients, leading to impairment in the immune system, wound healing, delay in chemotherapy cycles, among others, affecting disease prognosis and patient's quality of life (1–4).

Antineoplastic therapy, which consists of several modalities, isolated or combined, such as chemotherapy, radiotherapy, surgery, hematopoietic stem cell transplantation and others, presents some degree of toxicity for the patient, such as mucositis, diarrhea, vomiting, anorexia, dysphagia, metabolic alterations, xerostomia (dry mouth), dysosmia (alteration of smell), and changes in taste (dysgeusia). Chemotherapy is related to the systemic toxicity resulting from the mode of action of the agent used, whereas, radiotherapy is local when applied to tissues involved in flavor perception, but in other sites can produce systemic and psychological side effects. Management of chemotherapy induced nausea and vomiting are difficult to prevent completely (5–13).

II. TASTE AND SMELL ALTERATION IN PATIENTS WITH CANCER

Taste and smell alterations (TSA) not only present a problem for the patient, but for nutritionists in preventing resultant malnutrition and others in a caring role. Flavor, comprising taste, smell and somatosensory inputs, is commonly altered in patients undergoing chemotherapy resulting in malnutrition leading to cachexia. It is very known regarding taste and smell alterations associated with malignancies treated using chemotherapy and the various interventions proffered to lessen alterations. Flavor is the integration of taste (gustation), smell (olfaction) from both the orthonasal and retronasal routes and influenced by trigeminal inputs and with referral to the mouth. Many drugs and treatments elicit changes to these senses and of note are agents used in oncology therapy (6,8,10–17).

Many drugs, including cancer chemotherapeutics are secreted in saliva and gain direct contact with taste-receptors. Patients usually experience metallic or “chemical” taste when chemotherapy is delivered, which is consistent with drug secretion in saliva. Dysgeusia may persist after drug clearance, due to damage to the taste buds. . Furthermore, taste and smell dysfunction can persist many years after treatment completion (12,15)

Taste and smell alterations may contribute to an increased risk of malnutrition (either under or over-nutrition), besides low mood, diminished social interaction and reduced quality of life, an important predictor of morbidity, mortality, treatment response and toxicity in malignant neoplasms. Cachexia occurs in approximately half of all cancer patients and predicts poor prognosis. As TSAs occur in 40%–50% of those with cachexia (11,12,15,16)

Reduced food intake is a frequent problem at a hospital setting, being a cause and/or consequence of malnutrition, in patients with cancer but also other diseases. Howerver, food presentation can affect food intake and induce nutritional benefit. Improvement of meal presentation at a hospital setting can increase food intake, reduce waste food substantially and reduce readmission rate to hospital. Smell dysfunction appears to influence food likes for dairy, fruit and salad/greens (13,16,18).

III. ORAL NUTRITIONAL THERAPY, PREVENTION AND TREATMENT OF MALNUTRITION

Within malnutrition in cancer patients context, Oral Nutritional Therapy plays a fundamental role, helping to prevent and treat malnutrition. However, the use of nutritional supplements is not always well accepted by patients, especially those who have changes in taste and even smell. Thus, several strategies have been implemented for the proper management of oral nutritional supplementation, which include preparations with dietary ingredients, with or without the addition of complete nutritional supplements, nutrient modules. Counselling is used in some cases with positive results (5,7,11,17,19,20)

Clinical practice and the literature show that the use of oral nutritional supplements with homemade ingredients, with or without industrialized supplements, is much better accepted, especially if offered as preparations with a good visual appearance, in small portions, and with textures and flavors suited to patient preferences. The close association between the cephalic phase responses and the control of eating and digestive behaviors is multifaceted, and when the influences of taste and smell are diminished, other contributing factors guiding cephalic phase responses may compensate a deficit. The need for the application of a consistent lexicon is essential when describing taste and smell alterations. Intrinsic interventions to counteract TSA related eating alterations associated with chemotherapy are generally ineffective, but extrinsic interventions, based on gastronomy, can provide purpose to the eating process. Flavor enhancement has been found to improve patient-reported taste and smell capabilities, and Gastronomy as an Aid to Increasing people's Food Intake at Healthcare Institutions (5,10,13,14).

IV. CLINICAL GASTRONOMY: STRONG ALLIED TO HUMANIZED NUTRITIONAL ASSISTANCE

Gastronomy has always been related to eating well, in a pleasant way, however, the definition of gastronomy goes much further, since it is related to the culinary, but also cultural, aspects of a society, expressing in food the way of life and culture of the region or country inhabitants. In recent years, there has been an increase in the number of studies evaluating how cooking affects the food nutrient content. It is recognized for having followed the path of nutrition as a science, and currently, the fusion between nutrition, gastronomy and dietetic techniques is identified in the main health centers and hospitals, within a context called clinical gastronomy, which is a strong ally when it comes to precisely the humanized nutritional assistance. The concept of “hospital food” as something bad, without color or flavor, was worked on over time, so that the nutrition and dietetics service could implement strategies, based on knowledge and practice, that would demystify the concept of “hospital food”, even following therapeutic diets prescriptions that, many times, present many restrictions, in relation to the consistency and alteration of nutrientes (19,21–24).

The use of extrinsic influences commensurate with the principles of food behavior and gastronomy are considered as a means of providing purpose to patients to accommodate flavor loss which when integrated with counseling and appropriate intrinsic factors are potentially a means of curtailing malnutrition and enhancing the psychological status of the patient. The dietary prescription, when implemented together with clinical gastronomy, whenever possible according to the patient's clinical conditions, will be much more successful in relation to the patient's food acceptance, helping to prevent or treat malnutrition. Nutrition and dietetics service should aim to plan considering all sensory and hedonic issues of food, using food preparation techniques, determinants for the nutritional and sensory quality of meals (5,18,22,25).

Some factors should also be considered in clinical gastronomy, such as the utensils used, portion sizes, texture, smell, temperature, and final presentation of the preparation. In this way, it is possible that clinical gastronomy, encompassing improved culinary techniques, will certainly contribute to ensuring the sensory and nutritional quality of the preparations. It is important that professionals are involved, both in the kitchen and in the clinical nutrition service. Ideally, the clinical nutritionist, when visiting patients in their beds, should identify their nutritional needs, clinical conditions, diagnoses and therapeutic proposal, as well as the patient's expectations regarding meals, so that, adapting to the prescription diet possible at the time, the preparations are adequate (8,11,17,25).

In addition to contact with patients, it is very important for the nutritionist to receive information from the family member regarding food, which can often mean a "family recipe" or some preparation that awakens the patient's desire to eat. , and thus increasing trust and the bond between professional/patient. The concept of Comfort food applies to food or culinary preparations that refer to a time of life, the comfort of home, or situation in which memories are positive and happy. This method can be used for welcoming and as a facilitator to improve food acceptance. Thus, the importance of the interaction between clinical nutritionist and chef is verified. Many strategies can be used in order to improve reception, such as nutrition workshops, preparations completed at the bedside, which can also make the patient learn to reproduce the culinary preparation (13,26,27).

Clinical gastronomy is successful when it is capable of adapting the prescribed diet completely, considering the patient's profile, their cultural and regional aspects, and, mainly, adapting to their preferences. Furthermore, it must be emphasized that the healing process is not based only on eradicating the disease, but also on ensuring the physical and emotional well-being of the patient. Menus for choosing food offer the patient the possibility of choosing what he most wants, increasing the possibility of food acceptance, which happens differently when a menu is imposed on him. There is no perfect formula for this, but improving the management of the nutrition servisse (19,25,28,29).

The standardization of menus and recipes, as well as their rotation, are facilitators for a more assertive volume of purchases, improvement in the execution of recipes, improvement of team productivity, organization of production processes, improvement of internal flows and, above all, the delicacy of the assemblies of the dishes that will be destined to the patients. Recipes created and adapted to a particular patient must be rigorously evaluated by the multidisciplinary team (18,29,30).

Pasty diets generally have low acceptance, even for patients with stable clinical conditions and appetite, so preparations must be developed to improve the visual and sensory aspects of the meal, in order to increase food acceptance and, in many cases, accelerate the process. weaning from probes (29,31).

Considering children as the target audience, the meal should be playful, in addition to satisfying the dietary prescription. Nutrition education contributes to children´s understanding and practice of healthy lifestyles behaviors. Having a well hydration status is an essential topic, especially since children are a vulnerable population who are much more prone to dehydration than adults are (28,32).

It is essential to develop technical production sheets, in addition to a mirror image, to guide the production team in assembling the dishes, in addition to redesigning, discussing and testing all processes, and teams must be trained in order to be able to to develop their new routines within this service model, which is clinical gastronomy. (28,32).

Clinical nutrition is constantly evolving, which must be accompanied by clinical gastronomy. In addition, patients should receive not only hospital discharge guidelines, but also the necessary tools for this concept to be extended to the home, considering that many patients will spend a long period on antineoplastic treatment. Therefore, recipe manuals, books, e-books for patients to continue with gastronomic support even at home and maintain adequate food acceptance. The approval of the Report on the European Gastronomic Heritage: Cultural and Educational Aspects in 2014 served as starting point to work on innovative audio-visual and multimedia materials for children (24,27,32).

Cancer can significantly affect taste sensation, either due to the disease itself or, more commonly, by effects of cancer therapies. These effects can be of central and/or peripheral origin and are often challenging to diagnose. Hospital food requires more than any other nutrition and dietetic collaboration with food and cooking since both should be directed towards the same end, the correct feeding of the patients admitted, in the most pleasant culinary way possible. Furthermore, poor nutrition increases hospital readmission risk. In hospitals, harmony among cooks, dieticians and health professionals is an exciting challenge that has a direct impact on the patient's benefits.

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