

Supportive Care Interventions in Taste and Smell Alterations in Childhood Cancer and Hematopoietic Stem Cell Transplantation

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Abstract

Improving survival for children with cancer has been attributable to the provision of intensive therapies (i.e., high-dose chemo/radiotherapy and Hematopoietic Cell Transplantation-HCT). However, as a result of these treatments, most children suffer and experience severe and distressing treatment-related symptoms such as taste and smell alterations that can hamper the quality of life of these patients by influencing their appetite, body weight, and psychological well-being. In addition, one of the major adverse side effects during Hematopoietic Stem Cell Transplantation (HSCT) is malnutrition due to the many treatments related factors such as altered taste and smell and dry mouth. Since children have more nutritional requirements for growth and development, they are more vulnerable to malnutrition.

Editorial

Mortality in children and adolescents with cancer has declined substantially over the last few decades. This decrease can be largely attributed to intensive therapies and improved supportive care [1,2]. Unfortunately, intensive treatment is often accompanied by a high prevalence of severe physical and psychological symptoms [2,3]. While some symptoms have been well recognized by healthcare providers, such as pain, mucositis, and vomiting, others, such as nausea, sadness, and changes in taste, may be identified less frequently [1].

It is important to mention that there are other serious side effects of chemotherapy which are called oral complications. It is shown that oral complications in childhood cancer undergoing myeloablative chemotherapy prior to Hematopoietic stem cell transplantation or radiation therapy for solid tumors or head and neck malignancies are high. Also, there are some severe oral complications, such as oral infections, xerostomia, and mucositis. These side effects are usually followed by severe pain, malnutrition, potential systemic infections, bleeding, and taste dysfunction. As a result of these side effects, we can name a high hospitalization rate and a large rise in health care costs. Both acute and chronic oral side effects of cancer treatments are more common in children and adolescents than adults, with a rate of 30%–100% [4]. Moreover, the third most prevalent complaint (60.3%) is taste changes [5,6]. These are among ignored symptoms by health professionals that eventually lead to low food intake and consequently deteriorates nutritional status [7].

The lack of healthy food intake has some dangerous consequences, such as a low probability of survival, high rates of infections, and reduced well-being and quality of life. One of the consequences

of taste changes has been studied among adult patients. These patients that were on chemotherapy regimens such as taxane, anthracycline, and platinum-containing drugs) often experienced taste changes along with impaired smell function. However, this problem has not been studied in childhood chemotherapy [5]. Both taste changes and smell function in childhood cancer (n = 10) has been evaluated in just one study. This evaluation was done after bone marrow transplantation but not while chemotherapy treatment [5,7].

There are some bothersome symptoms of chemotherapy, including taste changes, oral mucositis, nausea, and vomiting that eventuate in the reduction of nutritional intake. Poor food quality in childhood cancer is associated with an increased risk of chronic disease. In addition, dietary preferences may be deeply altered during therapy by both the bothersome symptoms related to treatment and the drugs themselves, such as steroids, that mainly change appetite [8].

Malnutrition in childhood cancer is very risky because these children have increased nutritional needs due to cancer and its treatment. These patients also have increased nutrient requirements to attain proper growth and neurodevelopment. It has been shown that having a good nutrition intake plays a crucial role in various clinical outcomes, including response to therapy, health care cost, and health-related quality of life. Therefore, nutrition is very important in children with cancer who have taste and smell alterations in order to prevent the development of malnutrition [9].

Most patients undergoing HSCT may be considered at nutritional risk because of the anticipated toxicities affecting the ability to sustain adequate oral intake for a minimum of 3 weeks to 4 weeks. However, the role of baseline nutritional status is remarkable to the degree that any changes in this baseline before chemotherapy are considered negative prognostic factors when these patients are evaluated. In other words, possessing a healthy nutritional status takes less time for recovery [10].

The rapid increase of malnutrition after the start of cancer treatment underlines the need to develop evidence-based and efficient methods to provide nutritional support for children with cancer [11].

As recent studies show, various treatment approaches have led to improving taste changes, such as the use of zinc, transcranial magnetic stimulation, Alpha lipoic acid, ginkgo biloba, and pilocarpine [12–16].

In addition to these interventional studies, many individual cases reports on the management of taste disorders like High dose biotin, Application of glutamate, and Branched-chain amino acid-enriched supplementation (Aminofeel, Transient cooling of the mouth by using ice cubes, are found in the literature [12,13].

In order to increase the sensitivity of taste buds in treatment and

care, applying the following recommendations can be helpful;

- Mild spices and sweeteners.
- Nutritional aromas.
- Excessive fluid intake.
- Attention to oral care.
- Meats can be kept in sweet liquids.
- Use easily digested protein sources (fish, eggs, cheese, etc.)
- Frequent and small consumption.
- If possible the preparation of food should be done in another place.
- Eating cold foods instead of warm or hot foods.
- Fluid intake should be increased in order to increase salivation.
- Use of soft lemon or fruit candy, chewing gum, and lozenges.
- The ambient air should be humidified.
- Sour or tart food (lemonade) if the patient does not have mucositis.
- Artificial saliva [12–16].

In conclusion, it seems that malnutrition which is a crucial prognostic factor of mortality, morbidity, response to therapy, or toxicity in patients with cancer, is an inevitable consequence of taste and smell changes. Taste and smell changes have been reported before, during, and after cancer therapy, although much of the research relates to patients undergoing chemotherapy or radiotherapy. Prevalence estimates range from 16% to 70% in the former and 50% to 70% among the latter. There are some suggestions that should be given to the patients in order to prevent the risk of anorexia as one of the consequences of taste and smell alterations. In particular, appropriate approaches should include adequate information to anticipate taste changes and a psychological follow-up during the actual alteration of taste in everyday life.

In addition to mentioned treatment and care interventions to prevent anorexia/malnutrition risk, which is caused by taste and smell changes, the following should be included: Identification of children who can be malnourished or at nutritional risk must be achieved through improved approaches for risk stratification and classification- i.e., Pediatric Yorkhill Malnutrition Score (PYMS); A.S.P.E.N. Guidelines for the Use of Parenteral and Enteral Nutrition; Protein-energy malnutrition (PEM); WHO Z-score; Body Mass Index (BMI), Weight For Height (WFH), Arm anthropometry, etc. After determining risk factors, various strategies (parenteral and enteral nutrition) have been demonstrated to reduce malnutrition, minimize side effects of treatment and improve survival. The rapid increase of malnutrition after the start of treatment underlines the need to develop evidence-based and efficient methods to provide nutritional support for children with cancer. According to these factors, an individualized nutritional care plan may be initiated. To meet the aim of determining the expectations for nutritional

support and to develop new objectives, there is an essential need for multidisciplinary approaches such as collaboration and close communication between the patients, their families, and the medical team.

In addition, providing psychosocial support to children with cancer and their families will help them cope with the disease.

Health care provider for children who receive cancer therapy has the difficult task of skillfully combining the roles of scientist and clinician. These simultaneous roles require the health care providers to be humanist practitioner who is skilled in treatment decision-making, competent in clinical care practices and compassionate and empathic in human interactions while maintaining the ability to theoretically explain therapeutic and person-specific care outcomes.

Conflict of Interest

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. Informed consent was obtained for this publication.

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