

Awareness towards Dental and Oral Health among Parents of Children Undergoing Anti-Cancer Treatment

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Abstract

Purpose: The study aimed to assess the attitudes toward dental and oral health of parents of children receiving anti-cancer treatment.

Methods: This cross-sectional descriptive study was based on a convenience sample of parents of 50 pediatric patients who were receiving anti-cancer treatment (study group) and 62 parents of healthy children (control group). Questionnaires were distributed to assess awareness towards oral and dental care.

Results: Ninety percent of the respondents of the study group acknowledged awareness of the heightened importance of maintaining their children's oral and dental health. Academic versus non-academic education of the mothers was associated with greater concern that their children use a fluoride-containing toothpaste. Forty percent of the parents of the study group reported having received information on the link between ontological treatment with tooth decay and periodontal disease from oncology doctors. Among the study group, 42% of the parents had not taken their children with cancer to a dentist, though 34% of the children had complained of oral pain. Among the control group, the respective proportions were 5% and 2%. During the course of anti-cancer treatment, 44% of the children in the study group had oral ulcerations and 22% had dry mouth.

Conclusions: Despite their awareness to the heightened importance of dental and oral health, parents of children receiving anti-cancer treatment less frequently took their children for dental examinations compared to parents of healthy children.

Implications for Cancer Survivors: This study highlights the need for periodic referrals of children who are treated for can-

cer, to pediatric dental clinics.

Keywords: Awareness; Parents; Dental; Cancer; Immunosuppressant

Introduction

Background

Children with cancer who undergo immunosuppressive oncology treatments such as chemotherapy, radiotherapy, and bone marrow transplants are at risk of developing acute and long-term oral and dental complications. Acute oral effects may include mucositis, bleeding, taste alterations, secondary infections, salivary gland dysfunction, periodontal conditions, trismus, osteoradionecrosis, and oral neurotoxicity. Late oral phenomena include exacerbated dental caries, temporomandibular dysfunction, osteoradionecrosis, craniodental development, dental developmental anomalies, and oral graft versus host disease [1-2]. When children and their parents cope with a life-threatening disease, less attention may be given to oral and dental health. Other factors that may challenge these children's oral health maintenance are changes in oral flora, low awareness of the effect of the disease on oral health, low motivation, and discomfort or pain in tooth brushing [2]. Parents, positive attitudes and knowledge of oral health were shown to significantly increase the likelihood of their children brushing twice daily and maintaining hygiene [3-6]. Maintaining daily oral hygiene, also during ontological treatment, helps reduce gingivitis, infections of dental origin, and mucositis, thus improving quality of life.

The aim of this study was to assess attitudes, knowledge, and reported behavior regarding dental and oral health, of parents of children who received anti-cancer treatment.

Methods

This cross-sectional descriptive study was based on a convenience sample of parents who responded to a questionnaire regarding their children's oral and dental health. The questionnaires were distributed to 50 parents of children who were treated in the pediatric hematological oncology department in Hadassah Ein Kerem Hospital (study group) and 62 parents of healthy children (control group). All parents of children undergoing anti-cancer treatment were given the opportunity to participate in the study. Additionally, parents of children of similar ages who visited the Department of Pediatric Dentistry at Hadassah Medical Center and Faculty of Dental Medicine in Jerusalem for a dental examination were also invited to participate. The questionnaire was based on similar questionnaires developed and published by Gupta (2016), and Koerdt (2017), and was translated by the investigators into Hebrew and Arabic [2-4]. The questionnaires were applied as an interview by the investigators during 2021-2022. Eligibility criteria for both the study and control groups were: parents of children aged 0-18 years that did not have any diseases, other than the ontological diseases of the children in the study group. The questionnaire consisted of 5 demographic questions, 2 questions about the child's medical condition, and 11 additional questions, which are presented in Table 1. Two questions referred to the parent's awareness of the influence of oncological disease on oral health (q1a, and q1b), 4 questions concerned dental health (q⁶, q⁷, q¹⁰, and q¹¹), 3 questions were about oral hygiene habits (q³, q⁴, and q⁵), and 2 questions were about dietary habits (q⁸ and q⁹).

Statistical Analysis

All the data were inserted into Excel software and calculations were performed using SPSS statistical software (SPSS, version 25.0, IBM, NY). Quantitative variables were described as means and standard deviations and as medians and ranges. Qualitative variables were presented by frequencies and percentages. The ANOVA test was used to compare quantitative variables, and the Kruskal-Wallis or Mann-Whitney test to compare variables not normally distributed. Categorical data were compared by using the chi test or Fisher's test.

Results

Of the 50 parents in the study group, 19 were of children younger than five years, 11 of children aged 5 -10 years, and 20 of children older than 10 years. Of the 62 parents in the control group, 4 were of children under age 5 years, 16 of children aged 5-10 years, and 42 of children older than 10 years. Most of the participants were mothers (76% of the study group and 82% of the control group). The majority of the parents had an academic education, 62% of each group. Among the children receiving anti-cancer treatment, 50% had a diagnosis of leukemia or lymphoma, 16% had cancer of the central nervous system, 18% had a solid tumor, and 16% were diagnosed with another cancer. Of all these children of the study group, 82% received chemotherapy, 14% received chemotherapy in combination with radiation, and 4% underwent a bone marrow transplant. Ninety percent of the respondents in the study group reported knowing the heightened importance of maintaining oral and dental health due to their children's medical condition, and 60% knew that oncological treatment may increase the risk of developing caries and periodontal disease. A significant correlation was found between the mothers' education (academic/non-academic) and their concern that their children use fluoride-containing toothpaste ($\chi^2 (1,1)=9/064, p=.003, c=.426$). Forty percent of the respondents in the study group responded that they received information regarding the link of oncological treatment with tooth decay and periodontal disease from oncologists, 20% from dentists, 10% from oncology nurses, and 2% from family doctors. Table 1 shows the responses of the parents in the study and control groups to the questionnaire. Thirty-eight percent of the parents in the study group and 53% in the control group reported that the children in question brushed their teeth twice daily. Forty-two percent of the parents in the study group and 5% in the control group reported that they had not taken the children in question to a dentist. Seventeen (34%) of the children in the study group complained of oral pain and only one (2%) in the control group. Forty-six percent of the parents in the study group reported that their children consumed sweetened beverages and 56% reported the consumption of snacks between meals once a day or more. These proportions compared to 39% and 64%, respectively, of the parents' reports in the control group. During anti-cancer treatment, 44% of the children had oral ulcerations and 22% had dry mouth.

Table 1: Responses to the questionnaire, among parents in the study and control groups

	Question	Yes	
		Study group (n=50)	Control group (n=62)
1a	Are you aware of the link between oncological treatment and periodontal disease?	31 (62%)	0
1b	Are you aware of the link between oncological treatment and tooth decay?	34 (68%)	0
2	What was your source of information regarding the link of oncological treatment with tooth decay and periodontal disease? Oncologists Oncology nurses Family doctors Dentists	20 (40%) 5 (10%) 1 (2%) 10 (20%)	0
3	Does your child brush teeth twice a day?	19 (38%)	33 (53%)
4	Does your child brush teeth with the help of an adult?	21 (42%)	8 (13%)
5	Does your child receive fluoride supplementation?	27 (54%)	36 (58%)
6	Was your child ever examined by a dentist?	29 (58%)*	58 (95%)*
7	Has your child ever complained of pain in the oral cavity?	17 (34%)*	1 (2%)*
8	Does your child consume sweets and snacks once a day or more?	28 (56%)	40 (64%)
9	Does your child consume sweetened beverages once a day or more?	23 (46%)	24 (39%)
10	Has your child complained of ulcers in the mouth?	22 (44%)*	2 (3%)*
11	Has your child complained of dry mouth?	11 (22%)*	4 (7%)*

p value<0.05

Discussion

This study showed that parents of children who were receiving anti-cancer treatments had a high awareness of the importance of their children's oral and dental health. About 62% answered that they understood the effects of their children's ontological disease on periodontal disease and caries development, and 68% reported awareness regarding tooth decay. Among the study group, 42% of the parents had not taken their children with cancer to a dentist. This compares to only 5% of the parents in the control group who reported not having taken their children in question to a dentist. These data are remarkable as 34% of the study group children and only 2% of the control group complained of oral pain. Gupta et al. found that only 13% of parents of children receiving anti-cancer treatment had previously taken their children to a dentist [3]. Although the parents in our study were aware of the connection between oral and ontological illness, and although the children complained of pain that was sourced in the mouth, most of the parents did not consult with a pediatric dentist. In Israel, children receiving anti-cancer treatment are provided with dental insurance, removing financial worries during treatment. Possible reasons for this are that the children's medical condition or the family's availability did not allow for dental or other treatments beyond those that were life-saving. Additional explanations include low cooperation of the children, and a preference among the parents to postpone the dental treatment until the end of the ontological treatment. Inter professional collaborative care between pediatric dentists and oncologists during and after cancer therapy may promote optimal outcomes for pediatric patients [3,7]. Protocols of oncology departments must include a dental examination for each child before starting cancer treatments. This should entail personalized recommendations for maintaining children's oral health, during the illness and during the recovery period.

Most of the respondents to the questionnaires were mothers. Therefore, we examined the association between the mothers' education and their awareness of the importance of maintaining oral and dental health due to their children's medical condition. A significant correlation was found between the mothers' education and awareness. Specifically, academic mothers in both the study and control groups were more often concerned that their children used fluoride-containing toothpaste. This study reinforces the argument that educated women are more likely to investigate and learn about ontological disease and its effects on various aspects of children's health and well-being, including oral health [6]. Saied-Mowlem et al found that mothers with greater oral health knowledge and positive attitudes had children with better dental health, including sound dentition and regular twice-daily tooth brushing [6]. Families with higher education levels tend to have greater knowledge about oral health and a higher demand for dental services, resulting in better oral hygiene practices for their children in the early mixed dentition stage [14].

Compared to the control group, parents of children who were receiving anti-cancer treatments more often reported that their children complained of pain in the mouth and dry mouth. This was expected, as these symptoms are side effects of anti-cancer treatments [8-13]. The reported range of mucositis frequency varies from 30% to 40% to almost 100%, depending on the severity [12-13]. Hypo salivation and related complaints, particularly xerostomia, are common long-term complications of radiotherapy in the head and neck region. However, this phenomenon is rare in children and is usually transient [11]. Moreover, the ontological diagnosis was found to be correlated with parents' reports of the presence of sores in their children's mouths. Among healthy children, oral pain, dry mouth, and mouth sores were rare. This finding reinforces that among children undergoing anti-cancer treatment, more oral complications are present, and greater importance should be attributed to oral hygiene and oral health.

Limitations

A limitation of the study is that the participating parents were recruited from a convenience rather than a consecutive sample. As they were all parents of children with cancer who agreed to participate in dental research, their awareness may have been higher than that of non-participating parents. Moreover, a reporting bias should be considered, as the dental habits and dental visits presented are according to parental reports. Further studies should be conducted using a larger sample size.

Conclusion

Despite their awareness of the importance of their children's dental and oral health, parents of children receiving anti-cancer treatment consulted with pediatric dentists less than did parents of healthy children. This study highlights the need for periodic referrals of children who are treated for cancer, to pediatric dental clinics.

Declarations

Ethics Approval and Consent to Participate

The study protocol was approved by the Institutional Review Board of Hadassah Ein Kerem Hospital (HMO-0760-21). Written informed consent for participation in this study was obtained from each parent.

Consent for Publication

Not applicable

Availability of Data and Materials

All the data related to the study are available and can be found in Table 1. For additional details, please contact the corresponding author: Dr. Elinor Halperon, elinorhal@gmail.com.

Competing Interests

The authors have no conflicts of interest to declare.

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Authors' Contributions

EH and AFN conceptualized and designed the study, coordinated and supervised the data collection, and critically reviewed the manuscript for important intellectual content. HK designed the data collection instruments, collected data, carried out the initial analyses, and drafted the initial manuscript. GG, MM, AS, and DR conceptualized and designed the study, and reviewed and revised the manuscript. All the authors approved the final manuscript as submitted and agreed to be accountable for all aspects of the work.

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References

1. Dental Management of Pediatric Patients Receiving Immunosuppressive Therapy and/or Radiation Therapy. *Pediatr Dent*. 2018, 40: 392-400.
2. Kang CM, Hahn SM, Kim HS, Lyu CJ, Lee JH, Lee J, et al. (2018) Clinical risk factors influencing dental developmental disturbances in childhood cancer survivors. *Cancer Res Treat*.
3. Gupta A, Marwaha M, Bansal K, Sachdeva A, Gupta A (2016) Dental awareness among parents and oral health of paediatric cancer patients receiving chemotherapy. *J Clin Diagn Res*: 17412-819.
4. Koerdt S, Hartz J, Hollatz S, Frohwitter G, Kesting MR et al. (2018) Dental prevention and disease awareness in children with congenital heart disease. *Clin Oral Investig* 3: 1487-93.
5. Pahel BT, Rozier RG, Slade GD (2007) Parental perceptions of children's oral health: the Early Childhood Oral Health Impact Scale (ECOHIS). *Health Qual Life Outcomes*.
6. Saied-Moallemi Z, Virtanen JI, Ghofranipour F, Murtomaa H (2008) Influence of mothers' oral health knowledge and attitudes on their children's dental health. *Eur Arch Paediatr Dent*.
7. Ritwik P (2018) Dental Care for Patients with Childhood Cancers. *Ochsner J*.
8. Fayle SA, Curzon ME (1991) Oral complications in pediatric oncology patients. *Pediatr Dental* 13: 289-95.
9. Halperson E, Matalon V, Goldstein G, Saieg Spilberg S, Herzog K, Fux-Noy A, et al. (2022) The prevalence of dental developmental anomalies among childhood cancer survivors according to types of anticancer treatment. *Sci Rep*.
10. Elad S, Raber-Durlacher JE, Brennan MT, Saunders DP, Mank AP, Zadik Y, et al. (2015) Basic oral care for hematology-oncology patients and hematopoietic stem cell transplantation recipients: a position paper from the joint task force of the Multinational Association of Supportive Care in Cancer/International Society of Oral Oncology (MASCC/ISOO) and the European Society for Blood and Marrow Transplantation (EBMT). *Support Care Cancer*.
11. Jensen SB, Vissink A, Limesand KH, Reyland ME (2019) Salivary gland hypofunction and xerostomia in head and neck radiation patients. *J Natl Cancer Inst Monogr*.
12. Elad S, Cheng KKF, Lalla RV (2020) Mucositis Guidelines Leadership Group of the Multinational Association of Supportive Care in Cancer and International Society of Oral Oncology (MASCC/ISOO). MASCC/ISOO clinical practice guidelines for the management of mucositis secondary to cancer therapy. *Cancer* 19: 4423-31.
13. Sonis ST (2013) Oral mucositis in head and neck cancer: risk, biology, and management. *Am Soc Clin Oncol Educ Book*.
14. Chen L, Hong J, Xiong D, Zhang L, Li Y et al. (2020) Are parents' education levels associated with either their oral health knowledge or their children's oral health behaviors? A survey of 8446 families in Wuhan. *BMC Oral Health*.

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