

Role of pediatric oncologists in oral care for children undergoing cancer treatment : Study in Casablanca

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Abstract

Cancer therapies can be aggressive and cause oral complications that are frequent sources of discomfort or focal points of systemic infections compromising the good proceeding of the children antineoplastic therapy. The pediatric oncologists have a major role in reducing the intensity of these complications and improving the children's quality of life.

Aim : the aim of this study is to describe the attitude and practice of the pediatric oncologists towards dental care of children under cancer treatment.

Materials and Methods: this descriptive cross-sectional study was conducted on 33 practitioners made up of residents and teachers of four departments of the Casablanca university hospitals. The study was conducted over 6 weeks from 1st March to April 16 th.

The data collection was carried out through a questionnaire. The statistical analysis was performed using of the SPSS software

Results: 90.9% of the practitioners inform their patients of the necessity of dental care before cancer treatment, 39.4% among them ask systematically for a dental consultation, 93.9% of practitioners give oral hygiene instructions to children and their parents, 81.8% of practitioners prescribe a mouthwash to all children, 54.5% of practitioners advice their patients to brush their teeth several times a day, 6.1% of practitioners esteem that their knowledge in dental health are sufficient.

Conclusion: it appears that the majority of practitioners in Casablanca departments of pediatric oncology are aware of the importance of dental care in terms of

prevention and treatment even if differences exist in the application of this dental management.

Keywords : oncologist – children – oral care – cancer treatment

Introduction

According to the Cancer Register of the Grand Casablanca Region (2008-2012), the estimated yearly incidence of cancer in children is 11.5/100,000¹. This figure represents 3.3 % of all cancer recorded cases.

In the 0-14 age group, leukaemia was the most common type of cancer with 16.2%, followed by brain and meninges tumours with 16% and kidney cancer with 11.3%. More than 95% are treated in hospitals having a cancer registry² In addition to the existing three public hospital pediatric cancer units in Casablanca, Cheikh Khalifa Ibn Zaïd Hospital, The largest private hospital in Morocco, takes care of children and adolescents in pediatric oncology-hematology.

In recent years, neoplastic diseases in children have been accompanied by significant progress in treatment³, with long-term survival rates of 90% for some tumours, hence the need for more healthcare than at any other level and greater prevention of complications to improve quality of life as much as possible.

Oral complications in children with neoplasms can be significant and are the result of the immunosuppressive potential of the therapies used and their direct cytotoxic effect on the oral mucosa⁴. Cancer treatment can also severely impair odontogenesis. Dental caries and periodontal diseases are common especially in patients receiving radiotherapy of the head and neck; weakened immunity in these patients, combined with poor oral hygiene, can lead to rapid destruction of dental and periodontal tissues. The younger the child treated, the greater the oral complications, craniofacial and developmental abnormalities^{5,19}

Side effects of cancer therapies (mainly chemotherapy and radiotherapy) include chronic or acute oral manifestations that are frequent sources of discomfort (mucositis), changes in salivary function, foci of systemic infections and other side effects, depending on the type of cancer, its treatment and the stage of development of the child.⁶

It is important to emphasise that these various alterations require early and multidisciplinary care, as they may compromise the good proceeding of the therapy and complicate the oncologist's treatment plan, to the extent that the patient's life is endangered or the cancer therapy has to be interrupted. These disorders are aggravated by a precarious oral condition and the absence of a systematic protocol of preventive and curative oral hygiene. Several studies have addressed the issue of professional oral hygiene before oncology treatment⁷, they recommend that all cancer patients undergo an oral examination before the start of cancer treatment and treatment of pre-existing and concomitant oral problems in order to minimise oral complications in this population. Close collaboration is recommended between paediatric oncology services and Dentistry. In the United States, the National Institute of Dental and Craniofacial Research⁸ (NIDCR 2009), confirmed that raising awareness of the importance of oral health care among all paramedics, parents and oncology patients is essential for the good conduct of cancer treatment. According to the guidelines of the American Academy of Pediatric Dentistry⁹ (AAPD 2015), optimal oral hygiene strategies are the best guarantee of reducing the oral complications that a child with cancer may suffer from. The Leukemia & Lymphoma Society of Canada⁹ (LLSC, 2016) emphasizes that patients need to know more about dental care so that they can minimize side

effects and manage symptoms. Several studies have shown the major role of the paediatric oncologist in monitoring oral and dental infections that can complicate treatment and put the child's life at risk 10, 11. Given that paediatric cancer patients are mainly treated in public hospitals in Morocco 2 and as long as there is no Moroccan study that has focused on oral hygiene in paediatric oncology departments, we have carried out a study whose objective is to describe the attitude of paediatric oncologists at the Casablanca University Hospitals towards the oral hygiene of children undergoing cancer treatment, in order to highlight the involvement of these practitioners in improving oral health and in the control of oral complications before, during and after antineoplastic therapy.

Materials and methods

This cross-sectional descriptive epidemiological study was carried out in the city of Casablanca and involved the following four university hospital departments: the paediatric haematology oncology department of the 20 Août hospital, the radiotherapy department of the Ibn Rochd university hospital center, pavilion 3 of the Abderrahim Harouchi children's hospital and the paediatric oncology department of the Sheikh Khalifa Ibn Zaid hospital. The study lasted 6 weeks, from March 1 to April 16, 2019.

The survey targeted all practitioners working in the services mentioned above; teachers, specialists, residents and trainees. It was an exhaustive study.

Pediatric oncologists who treat childhood cancers were included; oncologists who deal exclusively with adult cancers were excluded.

After obtaining an approval from the various department heads, the dentist, distributed the questionnaires to the practitioners concerned by the study.

The data were collected using a four-part questionnaire: the first part concerned the oncologist practitioner's data, the second, third and fourth parts concerned successively the children's oral hygiene before, during and after cancer treatment, the fifth part concerned the oncologists' level of information on oral health and their need for collaboration with the dentists.

Data processing consisted of quantitative and univariate analysis using SPSS software at the Epidemiology and Bio-statistics Laboratory of the Casablanca School of Dentistry.

Results

Among the 33 practitioners interviewed, 32 received training at the university hospital center of Casablanca, 51.5% were represented by residents and 27.3% by professors. The majority of them treated children under chemotherapy (81,8%). The two following tables (table 1 and 2) successively illustrate the oral care by oncologists before and during the anticancer treatment:

Table 1 : Oral care of children in oncology services before cancer treatment

Variables	N	%	
Information on the need for oral care			
Yes		30	90.9
No		3	9.1

Information on the consequences of a bad oral state on the child's health		
Yes	30	90.9
No	3	9.1
Request for a panoramic X-ray		
Yes	0	0
No	33	100
Request for a dental consultation		
Systematic yes	13	39.4
In case of dental pain	3	9.1
If infection is suspected	6	18.2
In case of pain and infection	11	33.4
No	0	0
The timing of dental care and extractions		
Before the start of treatment	20	60.6
After treatment	2	6.1
Between two hospitalizations	10	30.3
Before or between two hospitalizations	13	
Removal of orthodontic appliances		
Yes	25	75.8
No	8	24.2

Table 2 : Oral care of children during cancer treatment

Variables	N	%	%
Frequency of occurrence of dental pain during treatment			
Never	0	0	0
Rarely	18	54.5	54.5
Often	12	36.4	36.4
Daily	3	9.1	9.1
Oral hygiene advice			
Yes orally	30	90.9	90.9

Yes orally and in writing	1	3	3
No	2	6.1	6.1
Category of professionals giving advice			
Doctor	21	63.6	63.6
Doctor and nurses	10	30.2	30.2
Mouthwash prescription			
Yes once a day	1	3	3
Yes several times a day	29	87.9	87.9
Yes in case of pain	2	6.1	6.1
No	1	3	3
Children receiving a mouthwash prescription			
All children	27	81.8	81.8
From a certain age	2	6.1	6.1
During certain treatment phases	4	12.1	12.1
Dental brushing authorization			18.2
Yes once a day			54.5
Yes several times a day	6	18.2	0
Not allowed	18	54.5	27.3
Other	0	0	
Recommended toothbrush	9	27.3	3
Surgical			75.8
Soft	1	3	0
Medium	25	75.8	0
Hard	0	0	21.2
No special toothbrush	0	0	
	7	21.2	
Information on physiotherapy advice			36.4
Yes	12	36.4	
No	21	63.6	
information on the value of fluoroprohylaxis			
Yes	14	42.4	
No	19	57.6	

With regard to children's oral hygiene after cancer treatment, 42% of the practitioners assessed the saliva secretion potential of children in the context of post-antineoplastic treatment. Finally, only 6.1% of practitioners considered their knowledge of oral health to be sufficient. All were convinced of the need to collaborate with dentists to improve the oral hygiene of children being treated for cancer.

Discussion

The choice of paediatric oncology services in Casablanca was based on the fact that they are the main oncology reference centers that care for children with cancer diseases in the Grand Casablanca region. The absence of specialists is explained by their assignment in other regions by the Ministry of Health. The high percentage of practitioners who treat children with chemotherapy is explained by the predominance of malignant haemopathies in children over solid tumours (treated with both chemotherapy and radiotherapy). The management of children receiving biphosphonates is much more limited, because of the problems they can cause in bone turnover 12 Pamela et al. find that clinical treatment of head and neck cancer with radiotherapy has oral sequelae that can affect patients' quality of life, affecting their chances of long-term survival. Radiation therapy and well-organised pre-treatment care can prevent or significantly reduce these oral problems 13 According to the National Cancer Institute 2006 5 and according to Othmani et al. 6 and Valera 14 , oral care for children with leukaemia is necessary and aims to reduce pain and discomfort, infectious and haemorrhagic risks, reduce soft tissue inflammation and restore masticatory functions. Any dental therapy will only be carried out in a context of

consultation between haematologist-oncologist and dental surgeon. Two evidence-based 8,15 guidelines, developed by expert groups in the fields of paediatric oncology and oral care, corresponded to these objectives. The majority of oncology practitioners (90.9%) inform parents about the consequences of poor oral health on the general health of their child. According to Çubukçu Ç.E. & Günes, A.M. (2008) 16 After diagnosis, a minority of parents simply did not take their child for regular check-ups because of time constraints, concomitant illnesses or because they did not perceive that their child had dental problems. The obligation to travel for dental care at another time and place can be an additional burden. It is therefore inevitable that dental care will be neglected in favour of that which is considered essential to the child's survival. Although mortality tends to decrease in oncology, it most often occurs as a result of a so-called opportunistic infection, it develops from latent, non-eradic foci which may be of dental origin 17 According to the Canadian Leukemia and Lymphoma Society 9 , there is a clear need to inform the child and his parents of the possible oral complications induced by the pathology and treatments and to give instructions on prevention and hygiene in order to limit them. The situation would be improved if all health professionals were equipped to give clear and consistent oral health advice and preventive measures. No practitioner routinely requests a panoramic X-ray examination before starting cancer treatment. This is due to the fact that oncology practitioners prefer to leave this role to the dental surgeon. This radiographic examination is necessary for initial assessment purposes, it is also a reference document for follow-up, for example to

determine the presence of infectious foci, periodontal disease, oral abnormalities and tumour invasion of the bones 13. If the child is routinely referred to a dentist, the dentist can take care of the prescription. In our study, a dental consultation is systematically requested in 39.4% of cases, while other practitioners request it in case of dental problems, if the child complains of pain and/or has a dental infection. According to a study carried out by members of the French society for the fight against cancer and leukaemia in children and adolescents aged 18, a dental consultation is systematically requested in oncology departments by 40% of practitioners. As Valera et col 14 and Arun M Xavier et col 19 point out, early and radical dental intervention reduces the frequency of problems, minimising the risk of associated oral and systemic complications. Each patient must be treated individually, and appropriate consultations with physicians and other dental specialists must be sought before dental care is undertaken, the child's risk of caries is also assessed and where dental treatment is indicated, a thorough discussion with the child's paediatric oncologist is necessary in order to coordinate the treatment programme 20. More than half of the practitioners in our study (60.6%) recommend dental care and extractions before starting antineoplastic treatment, which is a significant figure even if there is still room for improvement. According to Mercier and Col. 17, it is important, as much as possible, to perform care before the onset of oral problems, to include good oral rinses (0.9% saline or 1.4% sodium bicarbonate rinsing at least four times a day after meals). When mucositis is present, treatment is done with frequent care: every 2 to 4 hours, a compress soaked in saline solution or sodium bicarbonate can be applied to the teeth and gums 14. A mouthwash containing an

anaesthetic such as 2% viscous lidocaine helps to relieve pain. When the infection is proven, treatment is done with a polyethylene antifungal mouthwash: amphotericin (Fungyzone) or nystatin (Mycostatin). This antifungal is combined with an antiseptic such as sodium bicarbonate or chlorhexidine digluconate. Most studies have not shown any prophylactic action for the use of chlorhexidine. However, it does reduce bacterial species 24, 25, 26, 27. It is no longer routinely used to prevent oral mucositis in patients receiving radiotherapy, as it can cause reversible discolouration of the teeth and mucous membranes if used over a long period of time 28. Slightly more than half of paediatric oncologists (54.5%) advise children in care to brush their teeth several times a day, while 27.3% only allow brushing in cases of thrombocytopenia or painful mucositis. The majority of practitioners (75.8%) recommend using a soft toothbrush and 21.2% do not recommend a particular toothbrush. Based on the report of a British study 11 which sought to establish the current practice of oral care for children with cancer in 22 oncology centers. The use of routine preventive oral care showed the greatest variation between centers (90.9%): centers recommended regular tooth brushing with a minimum of two brushes per day, over 90% of centers suggested the use of a soft toothbrush but less than half specified the use of a fluoride toothpaste, despite the well-documented benefits of fluoride toothpaste] and the increased risk of caries associated with xerostomia. Only 36.4% of centers provided instructions on toothbrush care, such as not sharing toothbrushes with other family members, keeping toothbrushes dry and separate from others, and replacing them frequently (this ranged from every 6 weeks to every 3 months). The study carried out in France 18 showed that 84% of practitioners allow tooth

brushing and 26% of services provide the toothbrush to patients. Oral hygiene is essential, it must be systematic but individualised according to the child's haematological condition. As argued by Valera et al. 14, if the platelet count is above 50,000/mm³, the use of a toothbrush and dental floss is recommended, when the platelet count is between 20,000/mm³ and 50,000/mm³, the use of ultra-soft brushes or a compress is recommended, if the count is below 20,000/mm³, brushing should be avoided and should be replaced by rinsing with a non-alcoholic antiseptic mouthwash. Approximately two thirds of practitioners (63.6%) do not inform parents about the advice of early mechanotherapy in case of cervical-facial radiotherapy, due to the lack of information of most of them. According to the journal Effinger 29, trismus is observed in 7 to 27% of young patients treated by radiotherapy for carcinomas of the nasopharynx. Included in the radiation field, the masticatory muscles may undergo fibrosis, putting child cancer survivors at increased risk of poor oral and dental health, compromising oral function and the proper conduct of dental care 30. To this end, the young patient will be asked from the beginning of treatment to make opening, closing and teaching movements as much as possible, the use of piled clothes pegs or tongue depressors between the arches or the prescription of physiotherapy are all possible 21 Our study showed that only 42.4% of the practitioners questioned were informed of the benefits of fluoroprophyllaxis during and after cancer treatment. The study carried out in France 18 in the paediatric oncology department indicated that 58% of departments were informed about the possible application of fluoride varnish to protect teeth. Fluoroprophyllaxis can prevent caries and osteo-radio-necrotic complications. It would be interesting to

underline that fluoride intake for children undergoing anti-cancer treatments must be part of the prevention and care protocol 31. Only less than half of practitioners (42.4%) assess salivary flow after radiotherapy, although it has been shown that above a cumulative dose of 75 Gy, damage linked to the irradiation of the salivary glands is permanent. there is fibrosis and degeneration of salivary acinar cells which induce necrosis of the main salivary glands. Saliva becomes more viscous, its buffering capacity and pH decrease, leading to a significant increase in the prevalence of infections such as candidiasis, periodontal disease and caries to combat xerostomia 20, constant moistening of the mouth with artificial saliva or water has been shown to be effective 30. Only 6.1% of respondents consider their knowledge of oral health to be sufficient. According to a study carried out in the USA by members of the American Society of Radiation Oncology in Michigan on the oral health of patients treated with radiation therapy of the head and neck, 25% of the radiation therapists indicated that they lacked knowledge of oral health 32. This underlines the importance of training oncologists to increase their knowledge of oral hygiene education and oral care of children receiving cancer treatment in order to reduce the oro-facial complications that the child may suffer. Moreover, all the practitioners (100%) in our study are convinced of the need to collaborate with dentists for better care of children in oncology departments. This percentage shows that multidisciplinary training is necessary to optimise the results of cancer treatments. The pediatric oncology team must clearly inform the dentist of the patient's health status and treatment plan and, in turn, the dentist must communicate to the medical team the patient's oral health status, the proposed treatment plan and the time required before

starting treatment. The limitations of the study are the small sample size of hemato-oncology practitioners and the cross-sectional nature of the study, which does not allow correlations but only observations.

Conclusion / Recommendations

Taking into account the results of our survey, which highlight the attitude of practitioners towards the oral care of children in pediatric oncology services, the dental care strategy must take into account the therapeutic chronology and the general condition of the child, hence the need to provide this care in a hospital setting, in consultation between odontologist and oncologist.

It seems interesting to suggest the following recommendations:

- Involve the oncologist in improving the oral health of children with cancer, through the integration of a systematic preoperative oral assessment for these children.

The oncologist must refer patients to a dentist for preventive and curative care

- The integration of a dentist into the multidisciplinary pediatric team so that an automatic assessment of the oral hygiene of children with cancer is carried out.

- A dental care units integrated into the hematology hospital structures constitutes a step in the improvement of the multi-component treatment protocols

- Establish prevention and dental care protocol which will describe the role of medical oncologists and dental surgeons in improving the quality of life of children cared for in pediatric oncology services.

These protocols will serve as a guide available to all medical staff taking care of children with cancer

- Organize training sessions for medical oncologists through round-tables to highlight the importance of oral health in children receiving cancer treatments

- Make documentation about health and oral care in pediatric oncology services available to various stakeholders

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