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Assessment of oral health-related quality of life among children with acute leukemia

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Abstract

Aim: To assess the impact of oral health on the quality of life in children with acute leukemia.

Methods: Forty children (age 11 to 14 years) with acute leukemia from the Pediatric Oncology and Hematology Departments of the 20th August Hospital Casablanca and the Pediatrics Department P3 at Abderrahim Harouchi Hospital Casablanca, Morocco were surveyed. Data was collected via an administered questionnaire. The questionnaire is a translated version of the Child-Oral Impacts of Daily Performance Questionnaire in Arabic (validated in Morocco).

Results: The most commonly reported problems were: dental tartar, teeth position abnormalities, tooth decay, dental sensitivity and oral ulcerations. The overall prevalence of oral problems impacting upon daily activities (eating, speaking, cleaning teeth, relaxing, sleeping, smiling, showing teeth, studying and being in touch with other children) over the last 3 months was 52.5%. The most frequently affected daily activity was eating difficulties (45%) while the most frequently reported problem was oral ulcerations.

Conclusion: Studies have confirmed that children over the age of 11 are able to perceive their general and oral health as well as its impact on their daily lives. The current study showed that oral problems on top of general health complications among children with acute leukemia lead to a deterioration in their quality of life, which is already affected by malignancy and chemotherapy.



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Improving awareness on the importance of oral health-related quality of life among children with acute leukemia would be valuable.

Keywords: Oral health, quality of life, child, acute leukemia

INTRODUCTION

Leukemia can develop from lymphoid or myeloid cells and is generally classified as acute if cells are in an early stage of differentiation^[1]. According to a study conducted in the Pediatric Hematology-Oncology Department of Abderrahim Harouchi Hospital Casablanca, Morocco between January 2006 and December 2013, of 142 cases of acute leukemia, acute lymphoblastic leukemia (ALL) represented 89.5 % of cases^[2].

The oral cavity represents a privileged site for the development of complications related to both ALL and chemotherapy. These complications are mostly acute (mucositis, hyposialia, opportunistic infections, haemorrhage) but sometimes, long-term dental and craniofacial sequelae can develop as well. Oral management is thus always necessary for prevention or cure before, during and after cancer treatment^[3]. Therefore, the paediatric dentist plays an important role in the diagnosis, prevention, maintenance, and treatment of oral complications which can compromise the quality of life of children affected by leukemia^[4]. The World Health Organization defines quality of life as the perception that an individual has of his place in life, in the context of the culture and the value system in which he lives, in connection with his objectives, expectations, standards and concerns^[3]. To estimate the oral health-related quality of life in childhood, we opted for the Child-Oral Impacts of Daily Performance (Child-OIDP)^[5] which was developed from an abstract model of the oral quality of life, and submitted for psychometric evaluation^[6].

In spite of the critical oral state of children affected by leukemia and its certain impact on their quality of life, No previous study was performed to assess the the oral health-related quality of life among children suffering from acute leukemia in Morocco. Therefore the current study aims to shed some light on the impact of oral problems on the daily activities of children with acute leukemia through a survey questionnaire.

METHODS

The survey was a transverse, descriptive epidemiological investigation conducted within the Department of Pediatric Hematology-Oncology of the 20th August Hospital Casablanca and Department of Pediatrics P3 of Children's Hospital Abderrahim Harouchi Casablanca, which are referral health centers in Morocco treating sick patients of the Casablanca Region and part of the surrounding areas. The study was conducted by one investigator using a questionnaire administered to children who were between 11 to 14 years old, had acute leukemia and receiving chemotherapy/radiotherapy, and able to answer independently. Multiple variables were studied and the most important were:

Variables linked to the habits of oral and food hygiene

3 parameters were studied.

Frequency of brushing

The estimated number of dental brushings in a day (0, 1, 2 or 3 times).

Number of snacks a day

The number of meals taken by the child in a day (0, 1, 2 or > 2 times a day).

Dentist consultation

The estimated date of the last dental consultation, which can be: 1 year , [1-2years [, [2-5years [, > 5 year, never.

Variables linked to the child's quality of life

The child's quality of life was estimated using the translated version of the CHILD-OIDP questionnaire.

The first part included 18 items which represents a list of common oral problems (toothaches, sensitive teeth, decayed teeth, exfoliation of deciduous teeth, space between teeth, fractured permanent teeth, tooth staining, size or shape of teeth, position of teeth, bleeding gums, swelled gums, dental tartar, oral ulcerations, bad breath, deformation of the mouth or face, eruption of permanent teeth, missing tooth, other problems) during the last three months, that may or may not be related to the disease and its treatment.

The second part included 8 items which represented daily activities (eating, speaking, cleaning teeth, relaxing, sleeping, smiling, showing teeth, studying and being in touch with other children) that were difficult to perform during the last 3 months while specifying the extent (little, moderate, or severe) and frequency (1-2 times/month, ≥ 3 times/month, ≥ 3 times/week).

In the third part, the children must mention the oral problems which had impacted their daily activities.

Data was processed with Epi-Info 6.0.fr. with assistance from the Epidemiology and Biostatistics Laboratory team of the Faculty of Dentistry, University Hassan II of Casablanca, Morocco.

RESULTS

Oral and food hygiene

47.5% of patients brushed their teeth regularly, 62.5% took snacks less than 2 times a day and 70% had never seen a dentist [Table 1].

Oral and dental problems

The most common problem was the presence of dental tartar (82.5%), followed by problems with tooth position (67.5%), decayed teeth (57.5%) and sensitive teeth (50%) [Table 2].

Impacts of oral problems on daily activities

These oral problems had an impact on the daily activities of children: difficulties in eating (45% of children), in cleaning the mouth (15%), in smiling and laughing (15%) [Table 3].

DISCUSSION

The validity of self-evaluation of a child's oral health- related quality of life in general, and of oral health in particular, is accepted by some authors^[7,8]. Indeed, studies show that from the age of 11, children have a full perception of their general health, mouth and interactions of these with their lives^[7,9].

However, children are the subject of numerous oral problems which can affect their quality of life. Consequently, the introduction of quality of life measures linked to the child population's oral health is essential. In the present study, the frequency of daily oral hygiene was ≥ 2 times/day for 25% of children in our cohort, 1 time/day for 22.5% while 52.5% brushed irregularly.

With regard to dental consultation, 70% of the children have never consulted a dentist.

Table 1. Distribution of sample by oral and food hygiene

	Workforce	%
Number of brushing operations		
Irregularly	21	52.5
1 time/day	9	22.5
≥ 2 times/day	10	25
Number of snacks		
< 2 times/day	25	62.5
≥ 2 times/day	15	37.5
Last dentist consultation		
< 1 year	6	15
1-2 years	4	10
2-5 years	1	2.5
≥ 5 years	1	2.5
Never	28	70

Table 2. Prevalence of oral problems perceived by children

List of oral issues	Workforce	%
Tooth aches	9	22.5
Sensitive teeth	20	50
Decayed teeth	23	57.5
Exfoliation of deciduous teeth	1	2.5
Space between teeth	13	32.5
Fractured permanent tooth	4	10
Tooth staining	19	47.5
Size or shape of teeth	5	12.5
Teeth position	27	67.5
Gum bleeding	13	32.5
Swollen gums	10	25
Dental tartar	33	82.5
Oral ulcerations	16	40
Bad breath	14	35
Deformity of mouth or face	00	0
Permanent teeth eruption	4	10
Missing tooth	11	27.5
Other problems	02	5

Table 3. Prevalence of oral impacts on children's daily activities

Daily activities	Workforce	%
Eating	18	45
Talking	4	10
Cleaning mouth	6	15
Relaxing	3	7.5
Maintaining emotional state	6	15
Smiling, laughing, showing teeth	6	15
Performing school tasks	0	0
People contact	3	7.5

Another study carried out in Casablanca, Morocco on a population of healthy children revealed that 57.8% of them brushed their teeth at least twice a day, 30% brushed once a day and 12.1% did not brush their teeth. The same study demonstrated that 26% of children have never consulted a dentist^[10].

These results can be explained by the state of the children's general health in our study. In fact, in children with leukemia, their parents are so worried by the malignancy they neglect oral health. As leukemia is accompanied by a tendency for gingival bleeding, the fear of and high risk of hemorrhage in turn, lead children to avoid brushing their teeth.

Thus, ALL and its treatment can both directly and indirectly affect the patients' oral health and significantly reduce their quality of life^[11].

The impact of ALL treatment on tooth development and oro-facial growth is significant. Oral complications include the sequelae of hematologic malignancies and the unwanted effects of treatment. They can be classified as:

1. Primary complications, which occur mainly because of the disease itself, result from the infiltration of malignant cells in oral structures such as the gum and bone - for example, gingival hypertrophy or toothache due to pulp infiltration.
2. Secondary complications are generally a consequence of radiotherapy or chemotherapy, such as thrombocytopenia, anaemia and granulocytopenia. In particular, it has a tendency to bleed and susceptibility to infections.
3. Tertiary complications generally arise from the complex interactions of treatment and its side effects, such as immunosuppression, ulcerations, inflammation of mucous membranes, osteoradionecrosis, xérostomia, change of taste, trismus or carious lesions^[11].

In the present study, the global prevalence of oral problems was 100%.

In fact, oral mucositis is one of the most common oral complication in patients receiving chemotherapy.

A study carried out in Mexico on children with ALL demonstrated a prevalence of 38.7% of oral mucositis^[12]. The great majority of children reported that oral ulcerations were the main cause of oral problems. It contributed to the difficulty of achieving all the daily activities quoted in the questionnaire. Therefore, we can say that the quality of life of the children in our study is mainly influenced by oral mucositis.

Indeed, the pain associated with oral mucositis can cause difficulties in eating, drinking and speaking, which can all lead to weight loss, anorexia, cachexia and dehydration. Accordingly, the patient's quality of life is affected^[11]. In addition, the complications of general health have a clear impact on the quality of life of children with leukemia. In our study, 16 children reported that they left school because of the duration and frequency of hospitalizations, as well as fatigue and their psychological state.

Most of the complications of acute leukemia are due to the administration of chemotherapy which not only destroys the affected cells (lymphoblasts) but impairs the production of other blood cell types and other organs. Among these complications, those that directly influence the everyday life of the child include:

1. Emotional And Psychological Problems: This can result from treatment, the impact of disclosing the diagnosis to the patient, his parents and his social environment. The diagnosis of leukemia is traumatic, both on a physical and psychological level which can affect family functioning^[13].
2. Exhaustion: After treatment, some patients report extreme fatigue and incapacitation because of this exhaustion. It appears this may be exacerbated further by other physiological (anaemia for example) or behavioral (recalling breaking of bad news of the diagnosis, for example) factors^[14].
3. Malnutrition: This increases in prevalence especially when chemotherapy is intensive and treatment intervals shorten^[15].

Oral changes in children suffering from acute leukemia are often overlooked due to the priority given to their general health as well as treatment from both the parents and the medical team. This causes a change in the oral state, because these children may need assistance with daily brushing while hospitalized. Also, the psychological impact of leukemia may lead to overt parental concern towards the disease and result in neglect of their children's teeth and less attention on oral health. According to our study, the resulting oral problems, coupled with the poor general state of health of children with leukemia, will further damage their quality of life that is already impaired by leukemia and chemotherapy. Thus, providing oral health management to children with acute leukemia could improve their quality of life significantly.

In conclusion, acute leukemia can affect various body organs and systems and especially, the oro-facial region. Oral lesions that develop in hematologic malignancies are either due to the pathology itself or from its treatment. These oral afflictions impact upon the everyday life of children suffering from leukemia and affect their quality of life. That is why consultation with a dental surgeon as soon as the disease is diagnosed is necessary. The dental surgeon must be aware of the oral complications and dental problems arising from acute leukemia and how that may affect the patient's life. The global care of the child with leukemia, in collaboration with the medical team, is paramount towards improvement of his quality of life.

DECLARATIONS

Authors' contributions

Made substantial contributions to conception and design of the study: Bensouda S,
Conception of the study: Khoubila N,
Collect of Data: Iourdane H
Data analysis and interpretation: Al Jalil Z, Hamza M

Availability of data and materials

Not applicable.

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Conflicts of interest

All authors declared that there are no conflicts of interest.

Ethical approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

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