



The prevalence of oral manifestations in children with hematologic malignancies

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ABSTRACT

Leukemia is a common malignancy in young children. Acute lymphoblastic leukemia (ALL) accounts for 75% of all leukemia which has higher incidence in boys than to girls except during the first year of life. This study is the survey of oral manifestations in children who are suffering from leukemia and lymphoma in Amir Blood and Oncology Hospital, Shiraz, Iran.

Method & Material: In this 18 months durated study, the oral manifestations of 200 patients was analyzed including gingival bleeding & hyperplasia, pale mucosa hairy tongue, oral candidiasis, toothache and oral ulcers. The data obtained was subjected to statistical analysis using Chi-square test. Significance for all the statistical test was predetermined at a P value of 0.05 or less.

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Introduction

Cancer is one of the important causes of death in children between 1 to 14 years old. Boys are more often affected than girls (1.2:1). It is more often occurred in the first year of life [1-3].

Leukemia is proliferation of immature or blast cells of the bone marrow and replaces the normal marrow elements and tend to accumulate in various tissues of the body [4-7].

Leukemia is divided into acute and chronic on the basis of duration and character of the disease and each of them can be divided into myeloid and lymphoid by the type of involved cells [6].

Acute lymphoblastic leukemia (ALL) is an aggressive neoplasm, identified by disseminated proliferation of immature lymphoblasts of the bone marrow which may infiltrate lymphoid organs and some other body tissues [8]. It accounts for 97% of all leukemias and 75% of all acute leukemias [9].

Acute myelogenous leukemia (AML) is a neoplasm of immature myeloid WBCs which have an uncontrolled proliferation in the bone marrow space and in the peripheral blood [10].

Due to the high morbidity rate of AML, early diagnosis and appropriate management is essential. Rapidly forming gingival hyperplasia is mostly the first sign of disease [11,12].

Acute lymphoblastic leukemia (ALL), in children aged 2-10 years has a survival rate of 90% in 5 years [13].

Leukemia causes various oral manifestations. Oral manifestations can be divided into three groups. The first lesions are induced by malignant cells infiltration in to the structures such as gingiva and bone. Myelophthisic character of the disease is the cause of second lesions which contains symptoms of anemia, high bleeding tendency and increased susceptibility to infections. Third lesions are induced by the anti leukemic treatments which patients receive [14].

In some cases the first clinical sign of leukemia is oral manifestations, that can be recognized by dentists. Dentists have a significant role in control and maintenance of leukemic patient's oral health [15].

The most common manifestations of leukemia are lymphadenopathy, laryngeal pain, gingival bleeding, oral ulceration, gingival enlargement and oral infections [6,8,16].

The most common oral infection in these patients is candidiasis due to the extensive use of broad-spectrum antibiotics, chemotherapy, poor oral hygiene, malnutrition, and the general poor health condition of the patient. The most common viral infection in leukemia is due to herpes simplex which usually causes ulceration on the lips, palate, and tongue [15,17,18,19].

Gingival hyperplasia because of the infiltration of gingival tissue with leukemic cells is mostly observed in acute myelogenous leukemia (AML). Gingival hyperplasia is commonly seen with the following subtypes of AML: Acute monocytic leukemia (M5), acute myelomonocytic leukemia (M4) and Acute myelocytic leukemia (M1, M2) [20-23].

Non Hodgkin lymphomas (NHL) of the oral cavity characterized by malignant lymphoid cell neoplasms, which usually have B cell origin and subdivided histologically into different types of hematolymphoid tumors. Most NHLs involves lymph nodes but they can also arise in extra nodal sites in the oral cavity and oropharynx [24].

NHL commonly occurs in the sixth and seventh decade of life but among young children it predominantly contains two major sub groups: 1) Burkitt's lymphoma, which happens mainly between the third and sixth decade of life, 2) T-cell lymphoblastic lymphoma, which occurs predominantly in the first and second decade of life [25].

The common early sign of lymphoma is asymptomatic enlargement of the cervical lymph node chain, consequently the

dentist can play an important role in early detection by routine examination of the neck[26].

Materials and methods:

A cross-sectional study was carried out at Amir Blood and Onchology Hospital, Shiraz, Iran. 200 children suffering from leukemia or lymphoma had been visited by a specialist in oral medicine. In addition to the changes in oral cavity, sub type, time of onset and first evidences of the disease and the patient's age and gender had been recorded. Among these patient's %72.5 of them were already undergoing the different phases of intensive chemotherapy, %12 of them passed the period of chemotherapy and %15.5 of patients were not under chemotherapy until the research time. All relevant history including treatment regimen, medical and drug history were obtained from the hospital records. Oral examination was conducted using sterile mouth mirrors and disposable sterile gloves. The data obtained was subjected to statistical analysis using Chi-square test. Significance for all the statistical test was predetermined at a P value of 0.05 or less.

Results:

Among the 200 children examined 129 (%64.5) were boys with a mean age of 7.24 year and 71(%35.5) were girls with a mean age of 8.06 year old. The most type of leukemia in these patients was ALL and the less common was Burkitt's lymphoma.

percentage	number	subtype
71.5	143	ALL
21	42	AML
4.5	9	NHL
.5	1	Burkitt's lymphoma
2.5	5	Hodgkin lymphoma
100	200	total

%50.9 of patients reside in rural areas and %49.9 of them reside in city. Most of the patients (%72.5) were under chemotherapy during the research and %15.5 of them didn't get any chemotherapy. %12 of patients had got chemotherapy before but not during the research was done. %47 of patients had no pain in their teeth. Just %8 of them complained from generalized pain in their one or both jaws. The prevalence of gingival hyperplasia was %26 and the prevalence of spontaneous bleeding of gingival was %13 %63.5 of the patients didn't have oral candidiasis, and among those who had oral candidiasis, most of them was allocated to angular cheilitis. %82 of the children had no ulcer in their mouth, among those who had ulcer, most of them was located on labial mucosa(%7.5) and then on the buccal mucosa (%5). Non of the patients had gingival ulcers. %40.5 of the patients had hairy tongue. In order to appoint the relationship between the oral manifestations and the type of cancer, we use the chi-square test in the level of 0.05. The result of these tests shows that there isn't any relationship between the type of cancer with gingival hyperplasia, gingival bleeding and oral candidiasis, painful teeth and oral ulceration. 10 patients had oral manifestations as the first sign of disease which was gingival hyperplasia and gingival bleeding.

Discussion:

Cancer is the cause of mortalities in children between 0-14 years of age with the highest incidence in the first year of age. The second peak is in 2 or 3 years of age and it declines until age 9 and then steadily increases through adolescence [27]. Except during the first year of life the incidence is higher in boys than girls. In our study most of the patients were boys (69.5 %).

The most common pediatric malignancy is Acute Lymphoid Leukemia (ALL) which is %75 of all newly diagnosed leukemia's and one fourth(%25) of all cancers in childhood with a peak incidence at 4 year of age [3]. Most of our patients suffered from ALL(71.5%) similar to the findings of Subramaniam P, et al and Hou G-L, et al. (6,16)

Oral candidiasis, oral ulceration, gingival bleeding & hyperplasia, painful teeth are some of the oral manifestations of leukemic children whom they are/or not under chemotherapy[3,4]. One of the most common oral manifestations in our survey was hairy tongue (%40.5) and after that was gingival hyperplasia & inflammation (%26). gingival bleeding was %43.2 in AML patients and %28.6 in ALL patients in Hou G-L retrospective study in 1997[16]. 3 patients with ALL and 5 patients with AML had localized or generalized gingival enlargement in Michaud M, et al study in 1997[4]. %36.5 of our patients were suffering from oral candidiasis, in which angular cheilitis was the most common of them. Candidiasis of the oral mucosa was found in 21 leukemic patients in Michaud M, et al study in 1997[4]. Vincristin can cause neuropathy of the trigeminal and facial nerves which is clinically presents as a paroxysmal jaw pain, perioral paresthesia and weakness of the facial muscles, these symptoms usually subside when the drug is discontinued[28,29]. Generalized pain in the upper and lower jaws was the complaint of %8 of our patients who were treated with vincristin, similar findings were reported by Driezen S, et al in 1975[28]. 10 of our patients had oral manifestations as the first sign of disease which was gingival hyperplasia and bleeding. Cooper CL, et al in 2000 [20], Gogalniceanu D, et al in 2010 [22], Demirel S, et al in 2007 reported 3 cases who had gingival hyperplasia as an early diagnostic oral manifestation in acute leukemia.

Conclusion:

Due to the high prevalence of oral manifestations in leukemic pediatric patients and because most of these manifestations are the first sign and symptoms of this disease, it is important to paying more attention to these manifestations and the complete examination of oral cavity by dentists.

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