



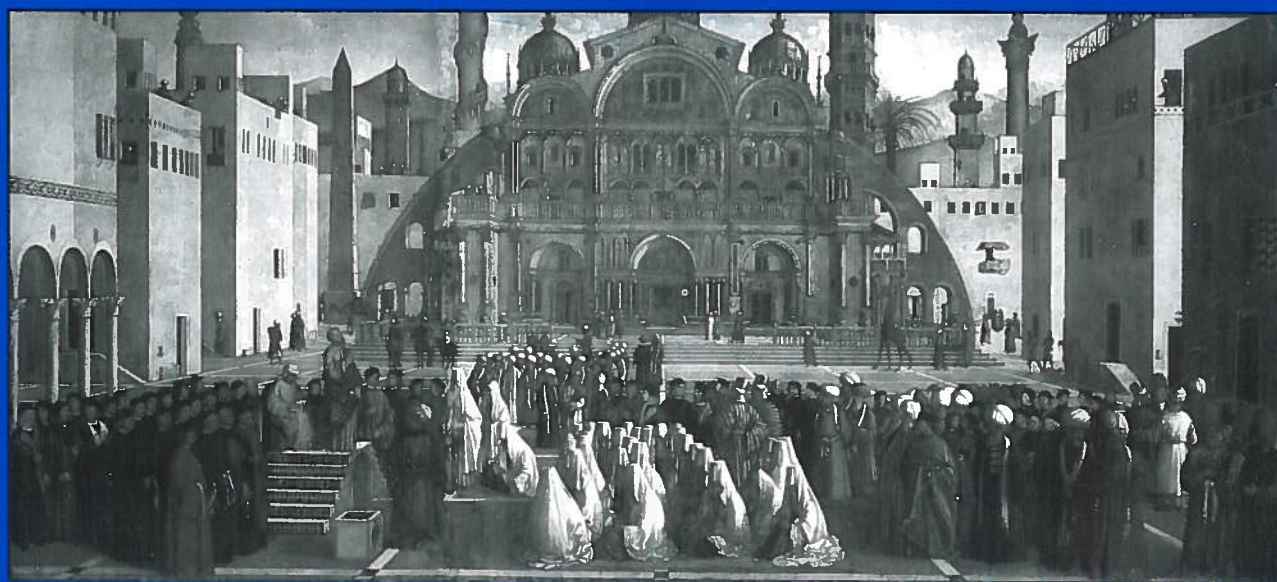
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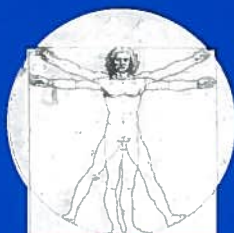
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ORAL MUCOSITIS IN CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIAD. LAURITANO¹, M. PETRUZZI², A. CAMBINI¹, M.S. GIACOMELLO¹, G. CACCIANIGA¹¹*University of Milano-Bicocca, Department of Neurosciences, Dental Clinic, Milano, Italy*²*Dental Clinic, University of Bari, Bari, Italy*

There are many types of cancers in children that are very different from those found in adults: leukaemia, lymphoma, and brain tumours are rather common in children. Acute lymphoblastic leukaemia (ALL) is the most common type of malignancy encountered. The role of pediatric dentist is very important before, during and after therapy: up to 24% of life-threatening infections arise from oral sites and areas. Early dental intervention and preventions procedures may significantly reduce oral complications associated with myelosuppressive cancer treatment. It is really important to evaluate the oral health surveys and to cut out potential sources of infection in mouth in these patients concurrent with their medical therapy. The aim of this review is summarizing the main features of oral mucositis in Childhood Acute Lymphoblastic Leukaemia, providing a little review for the approach, diagnosis and treatment of oral mucositis of ALL, which is frequent and potentially dangerous: it's important considering oral lesions of this type of childhood cancer in order to prevent complications before, during and after chemo or radio therapy to improve the quality of life of little patients.

There are many types of cancers in children that are very different from those found in adults: leukaemia, lymphoma, and brain tumours are rather common in children. Acute lymphoblastic leukaemia (ALL) is the most common type of malignancy encountered. World Health Organisation Cancer Mortality Database estimate 35.3 % of deaths from neoplasia in childhood is leukaemic forms. About 250000 new cases of leukaemia and 195000 deaths are registered every year all over the world(1).

From Oncology Nursing Forum of May 2011 we know that survival rates for childhood ALL have improved significantly over the past 50 years, such that the current five-year survival rate exceeds 85%. (2).

Acute lymphoblastic leukemia (ALL) is a clonal neoplastic disorder originating from lymphoid progenitors in the bone marrow, thymus and lymph nodes. About 80% of ALL are malignant proliferations of precursors of the B chain, while 20% include the frameworks of the involvement of the supply chain precursors T. It is a condition affecting both pediatric and adult population with peak prevalence between 2 and 5 years: ALL represents 80% of leukemias in children and young people under 15 years, and represents 20% of leukemia in the adult forms (3).

The etiology of ALL is unknown. Like other cancers this disease develops as a result of interactions of genetic and environmental conditions, such as important mutations in progenitor cells which are going to differentiate into T or B cells. It was also noted a certain familiarity especially in brothers, sisters and in twins: there is a 2-4 times higher risk of contracting the disease than in the average population and the risk is even greater in twins. However, there are some medical conditions closely associated to the develop of this disease: Fanconi and Bloom's syndrome, ataxia and teleangectasia. The risk is also increased in subjects exposed to chemicals such as benzene, cigarette smoke, pesticides, Vitamin K, or who has been previously undergone to cytotoxic treatments.

It has been shown that exposure to X-rays during pregnancy, such as excessive consumption of nitrates, may increase the incidence risk of acute lymphoblastic leukemia (3).

Aggressive chemotherapy and irradiation could generally influence and aggravate general health and quality of life of survivors. The effects of chemotherapy or the infections correlated to it continue to be the leading causes of morbidity and mortality in patients with ALL or lymphoma today. We can see in literature that 24% of

Key words: Childhood cancer, acute lymphoid leukemia, oral mucositis

Corresponding author:

Dr. Dorina Lauritano
Department of Neurosciences and Biotechnology
University of Milano-Bicocca
Via Cadore 48 20052 Monza- Italy
Mobile:+393356790163
Email:dorina.lauritano@unimib.it

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life-threatening infections arise from oral sites and areas. Early dental intervention and prevention procedures may significantly reduce oral complications associated with myelosuppressive cancer treatment. It is really important to evaluate the oral health surveys and to cut out potential sources of infection in mouth in these patients concurrent with their medical therapy (4).

The aim of this review is summarizing the main features about the approach, diagnosis and treatment of oral mucositis, which are frequent and potentially dangerous: it's important considering oral lesions of this type of childhood cancer in order to prevent complications before, during and after chemo or radio therapy to improve the quality of life of little patients.

Oral mucositis

Children under chemotherapy ALL, especially those treated with CRT, are more likely to have oral problems related to mucositis (5).

There are several factors which influence the site and severity of mucositis, such as the type of leukemia, the dosage of radiation and chemotherapy treatments, the health of patient and the conditions of oral hygiene before and during the treatment.

The most common oral problems caused by chemotherapy or eventually radiotherapy are the inflammation of the mucous membrane of the mouth (6) (Fig.1). Today the treatment of solid malignant tumors and leukemias with cytotoxic chemotherapy has always more efficacy but it is also associated with short- and long-term side effects. Among the clinically important acute side effects is disruption in the function and integrity of the mouth. These disease- and treatment-induced complications may also produce oral discomfort and pain, poor nutrition, delays in drug administration, increased hospital stays and costs, and, in some patients, life-threatening infection (septicemia) (7). Intensive chemo-radiotherapy damages the mucosal barrier of the mouth and throat and it is often associated with severe oral inflammation and infection, including herpes simplex, candidiasis, mucositis, and gingivitis (8, 11).

Normally mucositis is a state characterized by redness, loss of the epithelial barrier and ulceration: it is a disease that lasts for about 3 weeks: starts 3-5 days after the first dose of chemotherapy, and reaches its peak in 7-14 days. It tends to decline, if not over infected, especially by *Candida albicans*, and Herpes Simplex I. From a clinical point of view, mucositis is initially configured as a burning sensation, followed by inflammatory changes in the soft oral mucosa, which appears as erythematous erosive and ulcerative lesions (Fig.2).

Soft palate, oropharynx, buccal and labial mucosa, floor of the mouth and the underside (ventral) and



Fig. 1. Face and lips of a child with chronic GVHD.

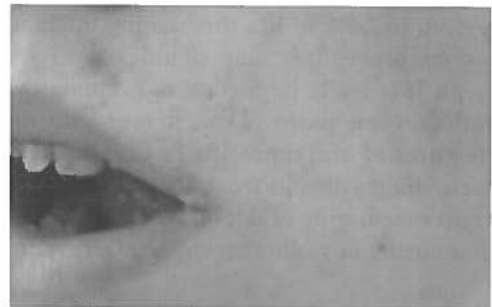


Fig.2. Particular of lips in child of 10 years with oral mucositis.

lateral surfaces of the tongue can be interested. Very often mucositis is anticipated by a state of altered taste, especially in patients undergoing radiotherapy with cumulative dose over 30 Gy (8). The perception of the bitter and acid are the first to be changed. The loss of taste is closely correlated with a decrease in the flow of saliva: a loss of saliva's flow reduces the protection of mucous membranes, involving changes on pH in the mouth with alterations on ionic composition of saliva: this consequently helps the onset of dysgeusia and stimulates the onset of mucositis.

Complete resolution of mucositis occurs seven to fourteen days after its onset. The neutrophils are the body's first line of defense. Therefore, the incidence and severity of infection are inversely related to their number.

Although a number of strategies and products are available for the management of oral mucositis, there is, as yet, no consensus on the management of this condition other than the effective means of administering pain medication. This may, in part, explain the reason for the current standard treatment for oral mucositis being symptomatic care with analgesics and nutritional support. Latest biological models validate once again the association between correct procedures of oral hygiene and improvement of mucositis, where the endotoxins due to bacteria colonizers, can amplify the cytokine cascade

and thus exacerbate the damages to the mucosa (12).

So there's usually an equality in the dental and nursing literature about the institution of good and consistent oral hygiene (9).

Today, according to the common clinical experience, it is common to practically prevent oral mucositis prescribing mouthwash with sodium bicarbonate, chlorhexidine and saline solutions and diphenhydramine and lidocaine 2% 10 ml for the relief of pain spit out after 30 seconds like a local anesthetic. It can be used paste containing Sucralfate to promote tissue regeneration (9, 13).

Chlorhexidine seems to be the best therapy prescription for prevention, reducing the severity and duration of mucositis the key is the correct dosage because this drug has destroying potentiality against the oral mucosa (10, 14). There are few studies in which the role of chlorhexidine is still discussing because of its irritant effect on oral mucosa.

There's generally a reduction in the incidence of mucositis up to 60% during the period of neutropenia related to implementation of the protocols of oral hygiene: but it depends on, as already mentioned, many variables (chemotherapy dosage, drug clearance, immunological local and systemic levels).

CONCLUSION

Dentists play a very important role in leukemic patient especially in prevention of oral mucositis. Our review we would analyze a protocol which could help us to prevent the onset of oral mucositis during antineoplastic therapy to improve the quality of life of leukemic children.

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