

Review Article



Oral Lesions in Pediatric Patients – A Review

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ABSTRACT

The aim of this study is to review the existing literature on the oral lesions in paediatric patients. The objective of this review is to give a detailed description of various studies and case reports of lesions in the oral cavity of paediatric patients. Oral lesions in children are diverse and show differences in clinical presentation and severity from that of adults. Paediatricians should be able to distinguish the normal clinical appearance of the intraoral tissues in children from gingivitis, periodontal abnormalities, and other oral lesions to manage the conditions better and sooner. Very little data exist for oral lesions in paediatric population. And this review article will be a detailed description of various oral lesions in children.

Keywords: Oral lesions, Pediatric lesions, Children, Severity, Systemic disease.

INTRODUCTION

Pediatric patients who come for a dental check up sometimes can present with various intra oral lesions that require accurate diagnosis, treatment or reassurance. Systemic diseases and oral health is always associated with each other. Certain oral lesions can indicate the presence of certain systemic conditions. Association between diabetes and periodontitis is a very good example for this. Oral signs and symptoms in a systemically compromised individuals can occur either from the beginning of the disease or during its progression. Undetected severe diseases like leukaemia can sometimes be revealed by its oral manifestation during intra oral examination by a dental professional.

Oral manifestations in HIV patients

The National AIDS Control Organisation estimates that the 2.3 million living with HIV/AIDS in India are children less than 14 years of age which comprises 3.4 %. Oral lesions in paediatric HIV infection are characteristic of the disease process and though, similar to adults, certain lesions are typical in the paediatric population.¹ Paediatric HIV infection is associated with a wide spectrum of oral lesions.^{1,2} The most frequently associated oral lesions are: candidiasis, herpes simplex infection, linear gingival erythema (LGE), parotid enlargement and recurrent aphthous stomatitis.^{1,2} Other viral and bacterial infections, including periodontal infections are less commonly associated, while hairy leukoplakia and Kaposi's sarcoma are rarely seen in HIV infected children.^{3,4}

i) **MUCOSITIS IN HIV:** Epithelial atrophy caused by anaemia and associated nutritional deficiency, predisposes to mucositis both of which lead to abnormal oral melanin pigmentation.⁵

- ii) **CANDIDIASIS IN HIV:** Candidiasis in an HIV infected child may present as creamy white pseudo membranous plaques, erythematous patches, angular cheilitis, non-scrapable hyper-plastic plaques or as combination of these⁶
- iii) **APHTHOUS ULCERS IN HIV:** Aphthous ulcers were present in nine patients (4.2%) with buccal mucosa, being the most common site. This finding was similar to the frequencies of 5% reported from Brazil and USA.⁷ Aphthous ulcers can be seen as minor, major or herpetiform or a combination of them, but usually take longer time to recover than that seen in non HIV infected patients.
- iv) **DENTAL CARIES IN HIV:** Several studies have shown slightly higher prevalence of dental caries in children with HIV. 63% of the children had past dental caries experience in a study on dental caries prevalence and dental health behaviour in HIV infected children.⁸ In primary dentition of HIV infected children, the anterior caries like early childhood caries, nursing bottle or baby bottle tooth decay pattern was commonly seen. The pattern of caries observed in this group of children may be as a result of poor oral hygiene practices, inappropriate use of a nursing bottle containing high sucrose liquids at bed time, medications containing high sucrose content, xerostomia induced by medication or HIV infection, the need for high caloric and carbohydrate/sucrose diets, and alterations in saliva viscosity, cytokines, protease inhibitors and immunoglobulin.⁹
- v) **DELAYED ERUPTION IN HIV:** In 31% of pediatric AIDS patients delayed tooth development has been reported and has been linked to lower CD4 counts.¹⁰
- vi) **XEROSTOMIA IN HIV:** HIV infected children are more commonly affected with xerostomia than HIV infected adults. The Causes of xerostomia includes



HIV infection itself, therapeutic antiviral and antimicrobial drugs, prophylactic medications, anti-retroviral, gamma globulin, or lymphocytic infiltration of the major salivary glands.¹¹

vii) **MAJOR SALIVARY GLAND ENLARGEMENT IN HIV:** Major salivary gland enlargement refers to lymphocyte mediated salivary gland disease in cases of HIV infection. It may affect the parotid and/or submandibular glands. It was first seen in paediatric HIV infection. It is also called Diffuse Infiltrative Lymphocytosis syndrome or Sjogren syndrome-like disease.¹¹ The aetiology of major salivary gland enlargement is unknown but infection with EBV or HIV or the interaction between these two viruses is suspected to be responsible.^{12,13}

viii) **TUBERCULOSIS RELATED ULCERS IN HIV:** Tuberculosis infection acts as an opportunistic infection as the immune response of HIV infected individuals is low and thus HIV and Mycobacterium tuberculosis occur as a combined infection and is common in developing countries.¹⁴ Oral manifestation would be painless, non-healing ulcerations on the buccal mucosa, hard palate, gingival or tongue. Sometimes it may be presented as a mass in the cheek¹⁵ or as macroglossia¹⁶ with tongue involvement. Identification of acid-fast bacilli in tissue sections or culture can be used to confirm the diagnosis. The oral lesions respond to treatment with use of anti-tuberculosis drugs.¹³⁻¹⁸

ix) **HSV INFECTION IN HIV:** HIV positive children who have two or more herpetic infection episodes within 1 year are classified as having moderately symptomatic HIV disease.¹⁹ There are 2 clinical forms: Primary herpetic gingivostomatitis, recurrent herpes simplex virus infection.²⁰ Primary herpetic gingivostomatitis is a systemic viral infection which presents with sudden onset of fever, swollen and tender cervical lymph nodes, irritability and malaise and widespread mucosal erythema, vesicles and painful coalescing ulcers. The gingiva, palate, dorsum of tongue, lip and the peri-oral skin are the commonest sites. Excessive drooling of saliva and pharyngitis often accompanies this infection. Resolution usually occurs within 14 days but the disease may linger for several more weeks in immuno-compromised children.²¹ Recurrent herpes simplex virus infection is characterized by sudden onset of focal erythema, clustered vesicles and painful coalescing ulcers. The ulcers usually involve the vermilion border of the lip, peri-oral skin and nasal mucosa and may form crusts extra orally. Intra orally, the gingivae and palatal mucosa are usually involved. Lesions typically heal within 7 – 10 days. Herpetic lesions recur frequently in severe immuno-suppression. Cytomegalovirus co-infection has been observed in these immunosuppressed individuals with persistent ulcers.^{22,23}

x) **ORAL HAIRY LEUKOPLAKIA (OHL) :** Oral hairy leukoplakia (OHL) was present in 1.4% of patients similar to frequencies reported from Romania, South Africa, and the USA (2%, 1% and 2%) respectively.²⁴⁻²⁶

xi) **KAPOSI'S SARCOMA IN HIV:** Kaposi's sarcoma is an opportunistic infection caused by the Epstein-Barr virus (EBV) and is a marker for increasing immunodeficiency. It is a common oral manifestation of HIV infection in adults with a point prevalence of approximately 20% but it is documented in only 2% of children infected with HIV. Human herpes virus – 8 has been identified in all forms of Kaposi's sarcoma.²⁷ Intra oral K.S occurs on heavily keratinized mucosa, the palate being the site in more than 90% of reported cases. Lesions can also be on the gingiva, tongue, buccal mucosa.²⁸ Kaposi's sarcoma presents as one or more erythematous, slightly bluish or violaceous macules or swellings with or without ulceration. It is predominantly seen on the palate or gingiva. A definitive criterion is characteristic histologic appearance on biopsy.²⁹ Nearly 30% of patients with KS also have lesions of the oral mucosa, most commonly on the hard palate. As these lesions grow, they may interfere with eating and speaking.

xii) **VARICELLA WITH HIV:** VZV infection can present as Herpes Zoster or Varicella (chicken pox). HIV infected children are at risk for persistent, recurrent, chronic infections with VZV. Children with advanced immune suppression seem to be at increased risk for recurrent disease and more severe manifestations of VZV. Chronic VZV infection has been described in HIV-infected children and adults with low CD4+ counts.^{29,30} Involvement of the second and third branches of the trigeminal nerve produces oral lesions on both keratinised and non keratinised oral mucosa that extend to the midline. Frequently concurrent vesicles and crusted skin lesions overlie the affected dental quadrant. Most cases heal without complications in children except for facial skin scarring.

xiii) **HUMAN PAPILLOMA VIRUS INFECTION IN HIV:** Human Papilloma Virus (HPV) induced oral lesions associated with HIV infection include Verucca vulgaris, condyloma acuminatum, focal epithelial hyperplasia, and koilocytic dysplasia which are referred to as oral warts. Oral HPV infections are rare in children. Oral warts present as raised, irregular, flesh coloured lesions.³¹ Oral HPV related lesions have a papillomatous appearance, either pedunculated or sessile and are mainly located on the palate, buccal mucosa, and labial commissure.³²

Oral manifestations in patients with Downs syndrome:

The skeletal and soft tissue features associated to DS individuals may contribute to increased drooling, angular



cheilitis, dry mouth, and an increased prevalence and severity of large and fissured tongue and cracked lower lips.^{32,33} Individuals with downs syndrome have relative macroglossia, as their oral space is smaller which makes the tongue look huge.³⁴

There can be marked fissuring of the dorsum of the tongue, and because of poor muscular control, the tongue is often protruded. Dental features associated with DS individuals include: microdontia of permanent dentition, altered crown morphology and shape, short root, enamel hypoplasia and hypocalcification, thinner enamel and dentine in the permanent dentition, taurodontism, hypodontia and supernumerary teeth, asymmetry and delayed eruption.^{35,36}

Lichen Planus in Children

Woo et al. 2007 did the literature review on childhood OLP from 1990 to 2005 and found the slight male predilection and common age of occurrence were 11 and 15 years with no ethnic predilection. Buccal mucosa was the commonly affected site, and most patients were with reticular pattern.³⁷ Kanwar et al. 2010, studied on 100 cases of childhood lichen planus and found that 16 had been vaccinated against hepatitis B. Familial pattern has also been reported.^{38,39} Lichen planus in childhood is uncommon, and the oral involvement is extremely rare. However, there is evidence of increased documentation of case reports and studies in recent years suggesting increase in the number of cases of childhood OLP indicating the rise of environmental factors.⁴⁰

Heart Transplant Recipient

Many authors^{41,42} agree that orthotopic heart transplant recipients show an increased prevalence of *Candida* yeasts and this was confirmed by our results. The reduction of *Candida* species in the oropharyngeal area could potentially decrease the incidence of disseminated candidiasis that is often associated to death cases in immunosuppressed patients.⁴² The number of *Candida* yeasts was significantly larger in the oral cavity of orthotopic heart transplant patients than in non-immunosuppressed subjects. There was higher prevalence of *C. albicans* in saliva isolates from both groups, but the proportion between this species and others was not statistically different.⁴²

Leukaemic Patients

Oral lesions may be the presenting feature of acute leukaemias, which can be rapidly fatal if left untreated.⁴³ Typical oral manifestations of acute leukaemias include gingival swelling, oral ulceration, spontaneous gingival bleeding, petechiae, mucosal pallor, herpetic infections and candidosis.⁴⁴ Severe gingival bleeding may be treated with local treatments with no need for platelet transfusion. Children rarely develop cancer but leukemia is the most common cancer among them; therefore, the highest cancer-related morbidity and mortality in children is due to leukemia.⁴⁴ There are 3000 to 4000 new cases of

ALL per year, two-third of which are in children. That is why ALL is largely considered childhood leukemia.⁴⁴ Katz and Peretz reported a case of trismus that resulted in a diagnosis of ALL. Trismus was most probably due to the infiltration of leukemic cells in the deep portion of contracting facial muscles.⁴⁵ Pericoronitis⁴⁶ and numb chin syndrome⁴⁷ are also reported as the primary manifestations of ALL. Gingival hypertrophy in another study was noticed as an unusual feature of precursor T-cell lymphoblastic leukemia.⁴⁸

Chemotherapy in Children

Oral mucosal wounds are also among the common findings in patients with leukaemia undergoing chemotherapy.⁴⁹ Candidiasis is a fungal infection commonly found in patients with leukemia undergoing chemotherapy. Periodontal disease due to infection is a common finding as well. Oral mucosal ulcers, uncontrolled herpes, candidiasis and pseudomonas infection were among the side effects of chemotherapy observed in patients.⁵⁰ Many studies recorded that mucositis typically appears 7 to 10 days after initiation of high-dose cancer therapy. Clinicians should be alert to the potential for increased toxicity with escalating dose or treatment duration in clinical trials that demonstrate gastrointestinal mucosal toxicity.⁵¹ High-dose chemotherapy, such as that used in the treatment of leukaemia.⁵² Approximately 40 % of adult cancer patients and more than 90 % of children under 12 years of age under going cancer treatment have oral manifestations that directly or indirectly arise from stomato toxicities, such as mucositis; xerostomia; fungal infections, such as candidiasis; and viral infections, such as labial herpes simplex.⁵³ The presence of an active dental surgeon on the multi disciplinary oncology team is therefore indispensable, as they can assist in the prevention, early diagnosis, and treatment of oral manifestations.

Steeve Johnson Syndrome

Stevens-Johnson syndrome, toxic epidermal necrolysis, and erythema multiforme are life threatening diseases causing mucocutaneous eruptions and can be difficult to manage medically. When oral tissues are involved, airway management can be of critical importance. Inflammatory changes including purulent conjunctivitis, erosion, ulcer and crusts may be observed in the eye, mouth, nose, pharynx, oesophagus, trachea, gastrointestinal tract, urinary tract and genital mucosae.

A case report of a child six-year-old, 154 cm tall and 18 Kg young boy who is the 1/1 child from non-related and healthy parents. He had painful aphthous ulcers in his mouth along with fever and skin lesions and blisters without itching, aphthous ulcers and vesicles were seen in oral cavity mucosa and patient's palate. Gums were inflamed (gingivitis) and there was no lymphadenopathy.⁵⁴



CONCLUSION

As a conclusion, dentists should be advised not only to recognize and treat the encountered oral lesions but also to refer the patient to specialized professionals for additional investigations, especially in the situation when suspect a severe systemic disease that require a precocious diagnosis or in the case when the establishment of diagnosis exceed the possibilities of the usual tests.

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