

Oral Manifestations of Institutionalized Human Immunodeficiency Virus-Positive Children and the Awareness of their Care Takers

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Abstract:

Background: Orofacial manifestations are among the earliest and the most common clinical signs of pediatric human immunodeficiency virus (HIV) disease. Most of these children are orphaned early and are taken care of by social organizations or relatives who lack adequate knowledge and awareness regarding their general or oral health.

Methods: In this study, oral manifestations in 90 HIV-positive children belonging to both the sexes, aged between 3 and 13 years were observed and a pre-structured questionnaire was distributed to 64 caretakers/parents of these children to assess their awareness about the oral health of these children. Children were selected from various HIV care centers in South India, and their oral cavities were examined for oral lesions, caries experience, and gingival conditions.

Results: Cervical lymphadenopathy (36%) was the most common extraoral mucosal condition and candidiasis (20%), linear gingival erythema (12.2%) were the common intraoral mucosal condition observed. Severe gingival inflammation was displayed by 40% of the children.

Conclusion: Oral lesions were observed in half of the study population examined. Dental caries increased with age. Lack of awareness among the caretakers/parents of these children about the effects of HIV on oral health was observed.

Key Words: Awareness, caretakers, children, human immunodeficiency virus, oral health

Introduction

It has been well documented in the last few years that women constitute one of the fastest growing segment of the human

immunodeficiency virus (HIV) infected population and that there has been a rise in perinatal transmission of the virus from mother to infant.¹ HIV infection is faster and more severe in children, due to immaturity of the immune system.²⁻⁴ In about half of these children, oral manifestations display the first signs of the disease.^{1,5}

Infection with HIV results in profound immunosuppression, rendering the host susceptible to the development of various opportunistic infections.⁶ The oral cavity is particularly susceptible to infection since it harbors numerous microorganisms that thrive in conditions of immunosuppression.⁷ Early detection of HIV-related oral lesions can be used to diagnose HIV infection and elucidate the progression of the disease, predict immune status, and provide timely therapeutic intervention.⁸ In a developing nation like India, this can be of immense benefit. Hence, this study was conducted to evaluate the oral manifestations in HIV-positive children. Most of these children are orphaned early and are taken care of by social organizations or less caring family members, who do not have adequate knowledge and awareness about general and oral health of these children. Hence, a questionnaire survey was also conducted to evaluate the awareness of caretakers of these children regarding their oral health.

Methods

Source of the data

A total of 90 children between the age group of 3 and 14 years belonging to both sexes, who were diagnosed to be HIV-positive from various HIV care centers in South India were selected for the study. Oral cavities of the children were examined after obtaining prior consent from the respective care center authorities.

Oral examinations

Oral manifestations of the children were recorded using a modified World Health Organization (WHO) oral health assessment form (1997).⁹ Oral cavity of the children was examined for oral lesions according to the diagnostic criteria for oral lesions in HIV infection of EC clearing house and WHO.¹⁰ Caries experience was recorded clinically, using the decayed and filled teeth (DFT) index for primary teeth and decayed missing and filled teeth (DMFT) index for permanent dentition. Gingival status was recorded using a modified gingival index given by Lobene *et al.*¹¹ The HIV-

positive children were examined at the care centers, seated on an ordinary chair, under good illumination either from natural light source or a hand torch using a sterile mouth mirror, while taking protective cross infection control measure using double disposable gloves and mask. All examinations were performed visually without probing of the oral tissues and were conducted by the same examiner, while a co-dentist assisted in recording the findings in the survey.

Questionnaire survey

The 64 caretakers/parents of these 90 HIV-positive children were given a pre-structured questionnaire to assess their awareness of the oral health of these children.

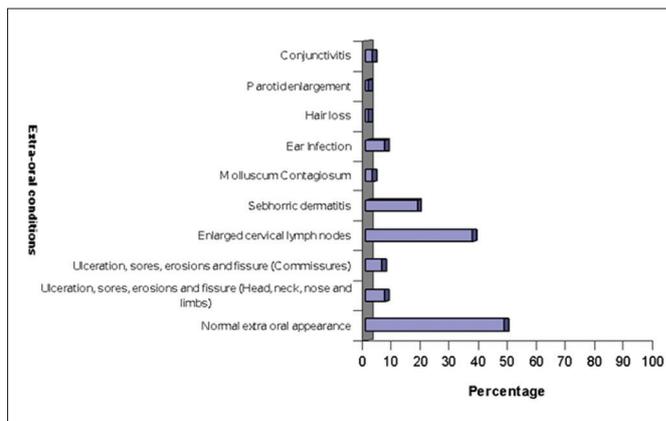
Result

Of the 90 children examined, 56 were boys and 34 were girls. 59% of the children were between the ages of 6 and 9 years. 45.6% of the children had lost both their parents to the epidemic.

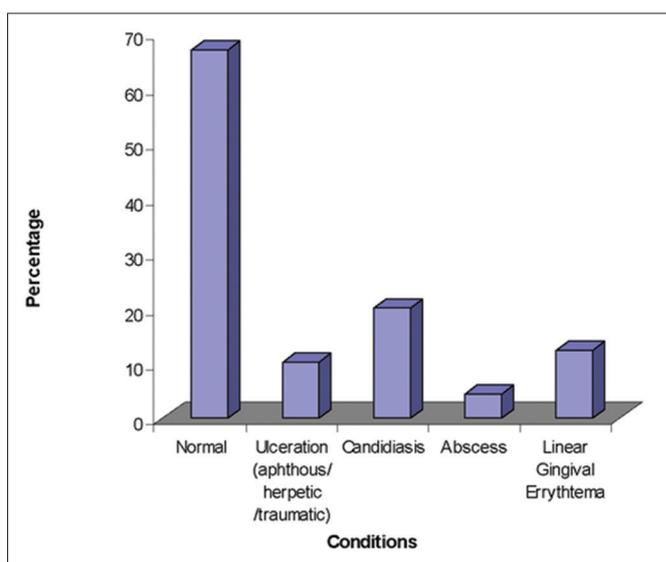
It was observed that 47.8% of the children had normal extraoral appearance and the most common extraoral condition among the remaining was enlarged cervical lymph nodes (36.7%) followed by seborrheic dermatitis (17.8%). Other extraoral conditions like molluscum contagiosum (2.2%), ear infection (6.7%), hair loss (1.1%), parotid enlargement (1.1%), and conjunctivitis (2.2%) were also noticed (Graph 1).

About 66.7% of children showed normal oral mucosa, while among the remaining the most common oral mucosal condition observed was candidiasis (20%) commonly on tongue, followed by linear gingival erythema (LGE) (12.2%) (Graph 2). Pseudomembranous candidiasis was observed in 77.8% of these children and erythematous type in the remaining (Table 1). Among the caretakers/parents interviewed, only 31.2% of them had observed intraoral mucosal lesion in these children of which common problem observed was a white patch (9.3%). On gingival examination, it was found that 37.8% of children had normal gingivae. Severe gingival inflammation was observed in 40% of the children, while moderate gingival inflammation was seen in 14.4% (Graph 3). 34.4% of the caretakers/parents were aware of problems affecting the gums with bleeding being the most common gum problem (Table 2). 9 (10%) children out of 90 had various forms of enamel opacity and hypoplasia (Table 3).

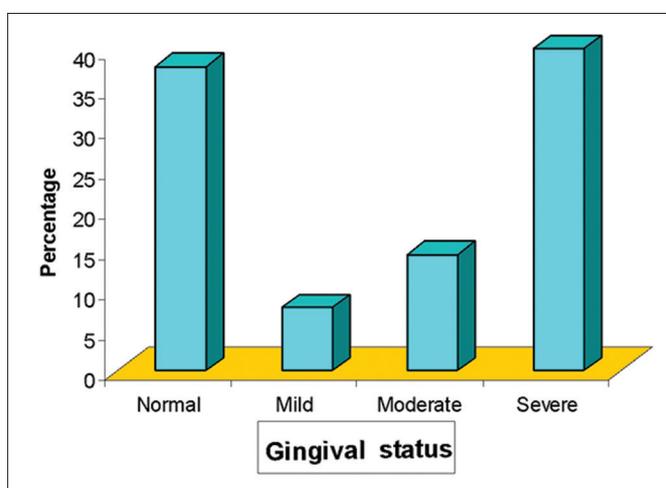
Of the 34 children in primary dentition group, only 12 (35.2%) children had carious teeth with mean DFT of 3.1764 and of the 51 children in mixed dentition group, 46 (89.2%) of them had decayed teeth with a mean DFT of 4.607 and mean DMFT of 1.5294. Four out of five children with permanent dentition had carious teeth with a mean DMFT of 2.50. The filled component of DFT and DMFT was found to be 0 for all the children (Tables 4 and 5). Only 4.6% of the caretakers had consulted a dentist for extraction of decayed teeth in these children.



Graph 1: The extraoral conditions seen in human immunodeficiency virus-positive children.



Graph 2: Depicting the intraoral mucosal conditions in the human immunodeficiency virus-positive children.



Graph 3: Depicting the gingival status in the human immunodeficiency virus-positive children.

Half of the children examined were on sugar containing antibiotic syrup Septran® and sweetened vitamin B complex

syrup. Only 10 children were administered antiretroviral drug zidovudine (Table 6). On interview, 59.4% of the caretakers were found to be aware of the problems affecting the teeth of their ward (Table 2).

Discussion

HIV disease remains a significant health care problem. It results in profound immunosuppression, rendering the host susceptible to the development of various opportunistic infections.⁶ Standard antibody testing is now available to

determine a person’s HIV status at an early age. However, because of the expense of complex technology, health workers in developing countries, where most of the world’s pediatric acquired immunodeficiency syndrome cases are found, must rely on early clinical indicators of HIV infection.¹² Regular maintenance and supervision of oral hygiene as well as regular dental consultation are vitally important for all children especially in the immunocompromised group like those with HIV infection. Parents/caretakers are responsible for guiding and supervising the maintenance of oral health in these children.

The questionnaire survey of 64 caretakers and parents revealed that most of them were aware of HIV infection affecting the overall health of the child, whereas only few were aware that it affected the child’s oral health (Table 2). This displays the ignorance of the caretakers regarding the effects of the disease on oral health.

Enlargement of cervical lymph nodes in children with HIV infection is usually a part of generalized lymphadenopathy. It is an early non-specific finding in HIV-infected children, and its presence alone does not meet the Centre for Disease Control criteria for symptomatic HIV infection.¹³ Here, the most prevalent extraoral manifestation was cervical lymphadenopathy which is in accordance with the findings of Costa *et al.*¹³ and Chan *et al.*¹⁴ A report from the Italian register of pediatric HIV infection documented that lymphadenopathy was a non-specific clinical sign in most of the long-term survivors and about half of the short-term survivors, indicating that the presence of lymphadenopathy was a positive predictor of survival in HIV-infected children.¹⁵

Parotid gland enlargement has been recognized as distinctive feature of HIV infection in children since the first descriptions of the disease and has been reported in 10-30% of children with symptomatic HIV infection¹⁶ and its presence is a predictor of positive prognosis and longtime survival in HIV-infected children.¹⁵ Bilateral parotid enlargement was found in only one child in our study, which is in accordance with the findings of Ketchem *et al.*¹⁷ However, other studies¹⁸ have reported a higher prevalence of parotid gland enlargement.

Seborrheic dermatitis was the second most common extraoral condition observed which was seen on scalp and face and is accordance with the findings of Dhurat *et al.*¹⁹ One child showed hair loss which could be because of seborrheic dermatitis affecting the scalp or opportunistic pyogenic infection.

Table 1: Types of candidiasis seen in HIV-positive children.

Candidiasis	Frequency	Percent
Pseudomembranous	14	77.8
Erythematous	04	22.2
Total	18	100

Table 2: Questionnaire answered by the caretakers/parents of HIV-positive children gave the following results.

Questions answered by the caretakers/parents	Caretakers/parents
	n (%)
Aware that HIV infection affected overall health of the child	61 (95.3)
Aware that HIV infection affected the oral health	8 (12.5)
Preferred toothbrush and paste for their child/ward	62 (96.8)
Did not supervise brushing in their child/ward	35 (63.7)
Children advised to use mouth wash	0 (0)
Observed halitosis in their ward	45 (70.4)
Aware of the problem affecting the teeth of the child	38 (59.4)
Aware of the problem affecting the gum of the child	22 (34.4)
Intraoral mucosal lesions observed	20 (31.2)
White patch observed	8 (9.3)
Aware of fluoride/pit and fissure sealant therapy being a preventive measure for dental caries	1 (1.6)
Consulted a dentist for oral problems	3 (4.6)

HIV: Human immunodeficiency virus

Table 3: Enamel opacity/hypoplasia seen in HIV-positive children.

Condition of enamel	Frequency	Percent
Normal	81	90
Demarcated opacity	3	3.3
Diffuse opacity	2	2.2
Hypoplasia	3	3.3
Diffuse opacity and hypoplasia	1	1.1

Table 4: Caries experience in HIV-positive children with primary dentition.

Number of children	Number of children with caries	Percentage with caries	Mean DFT	D/DFT	F/DFT
34	12	35.2	3.1764	108	0

DFT: Decayed and filled teeth

Table 5: Caries experience in HIV-positive children with mixed dentition.

Number of children	Number of children with caries	Percentage with caries	Mean DFT	D/DFT	F/DFT	Mean DMFT	D/DMFT	M/DMFT	F/DMFT
51	46	89.2	4.607	235	0	1.5294	78	0	0

The mean DMFT was 2.50. DMFT: Decayed missing and filled teeth, DFT: Decayed and filled teeth

Table 6: Medications consumed by HIV-positive children.

Medications	Frequency	Percent
Septran® and B-complex syrup	45	50
ART (zidovudine)	10	11.1
None	35	38.9
Total	90	100

ART: Antiretroviral therapy

Purulent discharge from the ears, ulceration in head, neck, nose, and limb, and ulcerations on commissures of lip seen almost same number of children. Ulcerations observed were non-specific and could not be attributed to any etiologic agent due to lack of laboratory facility to confirm the same. Conjunctivitis and molluscum contagiosum were observed in two children as was with findings of Frezzini *et al.*²⁰

Magalhães *et al.*⁴ had reported enamel hypoplasia in 23.68% of children examined, but this study found only 10% of the children with enamel hypoplasia of various forms.

Oral manifestations of HIV-infected children are among the earliest and the most common clinical signs of pediatric HIV disease. However, they have been reported in the literature infrequently, especially in Asian populations. Previous studies of HIV-positive children in Northern Thailand (57.5%), Brazil (61%), Romania (55%), and Thailand (49%), showed considerably higher percentage of oral lesions than that of HIV-infected children in USA (27%).²¹ The difference may be due to the limited availability of anti-retroviral therapy for children in developing countries due to its high cost. In this study, 33.3% of the children showed oral mucosal lesions. These varying prevalence figures could be attributed to racial, social, and geographical variations in disease presentation.

Candidiasis has been documented in various studies as the most frequently occurring oral manifestation in HIV-infected children with a prevalence ranging from 20% to 72%.¹⁴ In this study, oral candidiasis included pseudomembranous candidiasis or erythematous candidiasis¹² and candidiasis was observed in 20% of the children examined, which is in accordance with the studies done by Ketchem *et al.*,¹⁷ Moniaci *et al.*,⁸ and Katz *et al.*,²² Only 35.5% respondents noticed oral mucosal lesions in their child/ward, most common of which was white patch. Since oral mucosal lesions are not easily noticeable, the majority of the caretakers were not aware of the same. Topical antifungal agents such as amphotericin B lozenges or nystatin pastilles, which should be dissolved in mouth four times a day up to 2 weeks, can be beneficial for oral candidiasis.²³

Gingivitis has been shown to occur with a high frequency and greater severity in HIV-infected children.^{24,25} It has been observed that 37.8% of the children had normal gingiva with no inflammation, whereas the remaining showed moderate to severe form of gingival inflammation. Similar observations

were made by Gelbier *et al.*,²⁶ However, in the study by Chen *et al.*,²⁷ it was observed that majority of the children had moderate gingival inflammation which differed from our observations, and it could be because of the use of modified gingival index¹¹ involving only visual examination of gingival tissue. On interviewing the caretakers/parents, we found that most of them were unaware of the problems affecting the gums of these children highlighting their ignorance about this condition. Those who present with gingival and periodontal disease respond to scaling and regular reinforcement of oral hygiene instructions.²³

LGE was diagnosed as a distinct red linear band of erythema extending 2-3 mm apically from the free marginal gingiva and occurs frequently in HIV-infected adults. Howell *et al.*²⁸ in their study in young children found LGE to be present in 38% of the children whereas other studies have reported lower prevalence.²⁹⁻³¹ It was the next most frequently seen oral lesion, observed in 12.2% of the children in this study. The difference in prevalence of LGE may be related to the levels of immunosuppressions in the subjects of various studies.²⁸

Viral lesions manifested in the oral cavity include ulcers involving the tongue, palate, buccal mucosa, and pharynx caused by varicella zoster and coxsackie virus.⁶ Naidoo and Chikte¹⁸ reported intraoral ulcers in 14% of the institutionalized HIV-positive children. In the current study, 10% of the children showed intraoral ulcerations. These lesions are also seen in healthy children and are not specific to children with HIV infection.⁶ The intraoral ulcers observed were not attributed to any etiologic agents, due to lack of lab facilities to diagnose them. Topical corticosteroids such as triamcinolone, hydrocortisone lozenges, or beclomethasone spray can be used to manage these ulcers. Symptomatic relief can be obtained with the usage of chlorhexidine or benzydamine mouthwashes.²³ Dentoalveolar abscesses were observed in four children and none of the caretakers or parents was keen on seeking treatment from a pediatric dentist.

There was an overall increased incidence of caries in these children. The filled and missing components were zero in all primary and permanent teeth as the children had limited access to comprehensive medical or dental care. Only few of the caretakers had sought dental consultation for their ward and most were not aware of fluoride and pit and fissure sealants as a preventive measure for dental caries. Caries prevalence increased with age which may be due to exposure to unfavorable factors over time.

The higher caries rate among the children in the current study can be attributed to the use of sugar containing drugs (Septran® and B-complex syrup in 50% of the children and anti-retroviral drugs in 11%), the compromised immune status of these children and unmet preventive and restorative treatment need. Fluoride supplements with dietary advice in these children

can improve their dental health. Endodontic treatment can be carried out with the same expectations of success as in patients without HIV. All HIV-positive patients should be placed on preventive regimens irrespective of oral manifestations and need to be recalled at intervals not exceeding 6 months.²³

Conclusion

- The extraoral condition of almost half the children examined was found to be normal and among the remaining, cervical lymphadenopathy was the most common manifestation with submandibular lymph node being affected most of the time
- Two-thirds of the children displayed normal oral mucosa, while among the remaining children candidiasis was the most common intraoral lesion followed by LGE
- Most of the children showed moderate to severe gingival inflammation and increase in the prevalence of dental caries, which increased with age
- There was a general lack of awareness among the caretakers/parents of these children about the effects of HIV on oral health. Most of the caretakers/parents were found to be unaware of the problems affecting the oral hard and soft tissues of their ward/child and any treatment protocol for the same
- Care-takers/parents did not seek professional dental consultation for their ward/children.

References

1. Ramos-Gomez F. Dental considerations for the paediatric AIDS/HIV patient. *Oral Dis* 2002;8 Suppl 2:49-54.
2. Ramos-Gomez FJ. Oral aspects of HIV infection in children. *Oral Dis* 1997;3 Suppl 1:S31-5.
3. Rosenberg ZF, Fauci AS. Immunopathology and pathogenesis of human immunodeficiency virus infection. *Pediatr Infect Dis J* 1991;10(3):230-8.
4. Magalhães MG, Bueno DF, Serra E, Gonçalves R. Oral manifestations of HIV positive children. *J Clin Pediatr Dent* 2001;25(2):103-6.
5. Santos LC, Castro GF, de Souza IP, Oliveira RH. Oral manifestations related to immunosuppression degree in HIV-positive children. *Braz Dent J* 2001;12(12):135-8.
6. Chigurupati R, Raghavan SS, Studen-Pavlovich DA. Pediatric HIV infection and its oral manifestations: A review. *Pediatr Dent* 1996;18(2):106-13.
7. Lozada F, Silverman S Jr, Migliorati CA, Conant MA, Volberding PA. Oral manifestations of tumor and opportunistic infections in the acquired immunodeficiency syndrome (AIDS): findings in 53 homosexual men with Kaposi's sarcoma. *Oral Surg Oral Med Oral Pathol* 1983;56(5):491-4.
8. Moniaci D, Cavallari M, Greco D, Bruatto M, Raiteri R, Palomba E, et al. Oral lesions in children born to HIV-1 positive women. *J Oral Pathol Med* 1993;22(1):8-11.
9. World Health Organization. *Oral Health Survey: Basic Methods*, 4th ed. Geneva: WHO; 1997.
10. Classification and diagnostic criteria for oral lesions in HIV infection. EC-clearinghouse on oral problems related to HIV infection and WHO collaborating centre on oral manifestations of the immunodeficiency virus. *J Oral Pathol Med* 1993;22:289-91.
11. Lobene RR, Weatherford T, Ross NM, Lamm RA, Menaker L. A modified gingival index for use in clinical trials. *Clin Prev Dent* 1986;8(1):3-6.
12. Ramos-Gomez FJ, Petru A, Hilton JF, Canchola AJ, Wara D, Greenspan JS. Oral manifestations and dental status in paediatric HIV infection. *Int J Paediatr Dent* 2000;10(1):3-11.
13. Costa LR, Villena RS, Sucasas PS, Birman EG. Oral findings in pediatric AIDS: A case control study in Brazilian children. *ASDC J Dent Child* 1998;65(3):186-90.
14. Chan A, Milnes A, King SM, Read S. The relationship of oral manifestations to parameters of immune function and CDC stage in children born to HIV positive women. In: *Pediatric AIDS and HIV Infection: Fetus to Adolescent*, Baltimore: William and Wilkins; 1994. p. 101-7.
15. Features of children perinatally infected with HIV-surviving longer than years. *Italian Register for HIV Infection in Children. Lancet* 1994 22;343:191-5.
16. Pahwa S, Kaplan M, Fikrig S, Pahwa R, Sarngadharan MG, Popovic M, et al. Spectrum of human T-cell lymphotropic virus type III infection in children. Recognition of symptomatic, asymptomatic, and seronegative patients. *JAMA* 1986;255(17):2299-305.
17. Ketchum L, Berkowitz RJ, McIlveen L, Forrester D, Rakusan T. Oral findings in HIV seropositive children. *Pediatr Dent* 1990;12(3):148-6.
18. Naidoo S, Chikte U. Oro-facial manifestations in paediatric HIV: A comparative study of institutionalized and hospital outpatients. *Oral Dis* 2004;10(1):13-8.
19. Dhurat R, Manglani M, Sharma R, Shah NK. Clinical spectrum of HIV infection. *Indian Pediatr* 2000;37(8):831-6.
20. Frezzini C, Leao JC, Cedro M, Porter S. Aspects of HIV disease relevant to dentistry in the 21st century. *Dent Update* 2006;33(5):276-8, 281-2, 285-6.
21. Pongsiriwet S, Iamaroon A, Kanjanavanit S, Pattanaporn K, Krisanaprakornkit S. Oral lesions and dental caries status in perinatally HIV-infected children in Northern Thailand. *Int J Paediatr Dent* 2003;13(3):180-5.
22. Katz MH, Mastrucci MT, Leggott PJ, Westenhouse J, Greenspan JS, Scott GB. Prognostic significance of oral lesions in children with perinatally acquired human immunodeficiency virus infection. *Am J Dis Child* 1993;147(1):45-8.
23. Birnbaum W. Dental care for patients with HIV. *Dent Update* 1995;22:359-62.
24. Kline MW. Oral manifestations of pediatric human immunodeficiency virus infection: A review of the literature. *Pediatrics* 1996;97:380-8.
25. Ceballos-Salobrena A, Gaitan-Cepeda LA, Ceballos-Garcia L, Lezama-Del Valle D. Oral lesions in HIV/

- AIDS patients undergoing HAART including protease inhibitors: A new face of oral AIDS? *AIDS Patient Care STDS* 2000;14(12):627-35.
26. Gelbier M, Lucas VS, Zervou NE, Roberts GJ, Novelli V. A preliminary investigation of dental disease in children with HIV infection. *Int J Paediatr Dent* 2000;10(1):13-8.
 27. Chen JW, Flaitz CM, Wullbrandt B, Sexton J. Association of dental health parameters with oral lesion prevalence in human immunodeficiency virus-infected Romanian children. *Pediatr Dent* 2003;25(5):479-84.
 28. Howell RB, Jandinski JJ, Palumbo P, Shey Z, Houpt MI. Oral soft tissue manifestations and CD4 lymphocyte counts in HIV-infected children. *Pediatr Dent* 1996;18(2):117-20.
 29. San Martin T, Jandinski JJ, Palumbo P, Murray P. Periodontal diseases in children infected with HIV. *J Dent Res* 1992;71:151.
 30. Leggott PJ, Robertson PB, Greenspan D, Wara DW, Greenspan JS. Oral manifestation of primary and acquired immunodeficiency diseases in children. *Pediatr Dent* 1987;9(2):98-104.
 31. Palumbo P, Jandinski J, Connor E, Fenesy K, Oleske J. Medical management of children with HIV infection. *Pediatr Dent* 1990;12(3):139-42.