CASE REPORT

Prevalence of oral lesions in HIV infected children on HAART and its correlation to disease progression at Arthur Davison children's hospital in Ndola, Zambia

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Abstract

Objective: The purpose of this study was to determine the prevalence of oral lesions in HIV infected children on highly active antiretroviral therapy (HAART) and association of HIV progression with oral lesions at Arthur Davison children's hospital in Ndola, Zambia.

Participants and Methods: A cross sectional study was conducted among 212 children aged 0-15 years. Participants were selected from patients coming to access HAART on any particular day at Arthur Davison Children's' Hospital Ndola, Zambia between November and December 2014 following informed consent. Participants needed to have been on HAART for at least one month.

Oral lesions were detected and diagnosed based on clinical presentation. Data was captured using Epi Data version 3.1 and analyzed using SPSS version 16.0 for windows. The Fisher's exact test and the Yates' corrected Chi-squared test were used to compare proportions at the 5% patient significance level.

Results: A total of 212 patients were recruited into the study. The majority (47.6%) was in the age group of 10-15 years. More than half (57.2%) of the patients were females. Of the 212 participants, 33 (15.6%) had oral lesions. Angular cheilitis was the most common lesion (8.1%) children, while Herpes simplex was the least common (0.5%). Out of 212 clients, 202 (95.3%) were on first line drugs (Zidovudine, Lamivudine & Niverapine, or Abacavir, Lamivudine & Niverapine). There was no statistically significant association between age and drug regimen (p=0.751). No significant association was observed between CD4 count and lesions (p=0.405).

Conclusion: A low prevalence of oral lesions was observed among children on HAART. Adherence and early initiation on HAART is encouraged in order to maintain the low prevalence of lesions in this population.

Keywords: Prevalence, Oral lesions, Children on HAART, Ndola, Zambia

Introduction

Oral lesions can be defined as diseases of the soft and hard tissues that affect oral cavity and its associated tissues and structures. Oral lesions may be classified as fungal (Oral Candidiasis which has four forms, Erythematous, Pseudomembranous, Angular cheilitis and Hyperplastic), viral (Oral Hairy Leukoplakia, Herpes simplex), bacterial infections (Necrotising ulcerative Gingivitis, Linear erythematous gingivitis, Necrotizing ulcerative periodontitis), neoplasms (Kaposi's sarcoma, non-Hodgkin's lymphoma, Immune-mediated lesions (aphthous ulcers and necrotizing stomatitis), others (xerostomia and salivary gland)[1].

Oral lesions in paediatrics are characteristic of the disease process and certain lesions are typical in the paediatric population[2]. Several factors may influence development of such lesions such as low CD4 T cell count and Xerostomia which may be due to drugs and lack of accessibility to highly active antiretroviral therapy (HAART)[3].

Prevalence of oral lesions has significantly reduced since the introduction of HAART, Most studies done on oral soft tissue lesions in HIV-infected were done on adults[4].In Zambia the only study on oral lesions among HIV-infected patients done at St Francis Hospital, Katete, involved 107 adults[5]. The most common oral lesion in this study was oral candidiasis (25%) and no study was found concerning prevalence of common oral lesions in children. The purpose of this study was to determine the prevalence of oral

lesions in HIV infected children on HAART and association of HIV progression with oral lesions. This information would be useful for the Ministry of Health [Zambia] to formulate strategies for prevention, early detection and improve management.

Participants and Methods

A cross sectional study was conducted among 212 children aged 0-15 years. Participants were selected from patients coming to access HAART on any particular day at Arthur Davison Children's' Hospital Ndola, Zambia between November and December 2014 following informed consent. Participants needed to have been on HAART for at least one month. Oral lesions were detected and diagnosed based on clinical presentation. An average of 600 patients were available to sample from in a month, a pilot study indicated that the prevalence of Oral lesions in HIV children on HAART was 16%. Considering a 95% confidence level and estimating the prevalence with 5%, the required minimum sample was 154. Adjusting for a 90% response rate, 212 children were consecutively sampled.

The Copperbelt University Public Health unit approved the study. Permission to conduct the study was obtained from the Executive Director of Arthur Davison Children's' Hospital.

The following data were collected on a structured capture sheet: age, gender, height, weight, type of oral lesion, type of HAART regimen andCD4 T cell count. Extra oral and intra-oral examinations were done by a qualified Dental Surgeon with the assistance of a qualified Dental Therapist. Participants sat on a chair and examined under natural light using disposable gloves and wooden spatulas. Oral lesions were detected and diagnosed based on clinical presentation. Nutritional status was assessed using World Health Organization standards[6] for 0-2 years old patients and Centers for Disease Control and Prevention[7] standards for 2-20 years old patients. Data was captured using Epi Data version 3.1 and analyzed using SPSS version 16.0 for windows. Any patient with Oral Candidiasis or Angular cheilitis or Herpes simplex or Parotid enlargement or Non-specific ulceration or Necrotizing ulcerative gingivitis was deemed to have oral lesion. The Fisher's exact test and the Yates' corrected Chi-squared test were used to compare proportions, where appropriate, at the 5% significance level.

Results

A total of 212 patients were recruited into the study. The majority (47.6%) was in the age group 10-15 years. More than half (57.2%) were females (Table 1). Of the 212 participants, 33 (15.6%) had oral lesions. Angular cheilitis was the most common lesion (8.1%), while Herpes simplex was the least common (0.5%) as shown in Table 2. Three (1.4%) patients had 2 combinations of oral lesions, 30 (14.2%) had one oral lesion only and 179 (84.4%) had no oral lesions.

Among 212 participants**,** 202(95.3%) of participants were on first line drugs (Zidovudine, Lamivudine & Niverapine, or Abacavir, Lamivudine & Niverapine). The remaining 10 patients were on second line drugs (Abacavir, Lamivudine and Lopinavir/r). There was no statistically significant association between age and drug regimen (p=0.751) as shown in Table 3.

Table 4 shows associations between demographic factors (age and sex) and CD4 count with oral lesion. No significant associations were observed between demographic factors (age [p=0.643] and sex [p=0.643]) and oral lesion. Furthermore, no significant association was observed between CD4 count and oral lesions (p=0.405).

Table 1: Distribution of the patients by socio-demographic variables (Total=212)

Factor	n (%)
Age (years)	
<10	111 (52.4)
10-15	101 (47.6)
Sex*	
Male	89 (42.8)
Female	119 (57.2)
[1]Weight for age (percentile)	
<2.5	84 (41.4)
2.5-97.5	117 (57.6)
>97.5	2 (1.0)
[1]Height for age (percentiles)	
<2.5	65 (32.5)
2.5-97.5	127 (63.5)
>97.5	8 (4.0)
[1]Weight for height (percentiles)	
<2.5	30 (35.7)
2.5-97.5	52 (61.9)
>97.5	2 (2.4)

*Percent based on a total of 208 due to missing information

[1] Numbers not adding up due to invalid height/length, missing information on sex, weight or height/length

Table 2: Prevalence of the Oral Lesions (Total=212)

[1]Oral lesion	n (%)
Oral Candidiasis	3 (1.4)
Angular Cheilitis	17 (8.1)*
Herpes Simplex	1 (0.5)
Parotid Enlargement	9 (4.2)
Non-specific Ulceration	4 (1.9)
Necrotizing Ulcerative Gingivitis	2 (0.9)
Any lesion	33 (15.6)

*Percent based on 211 patients due to missing information

[1]Some patients had more than one lesion

Table 3: Distribution of participants by age group and drug Regimen

Factor	Total	Drug regimen 1st line	2nd line	P value
Age (years)	n (%)	n (%)	n (%)	0.751
<10	111 (100)	105 (94.6)	6 (5.4)	
10-15	101 (100)	97 (96.0)	4 (4.0)	
Total	212 (100)	202 (95.3)	10 (4.7)	

Table 4: Associations of demographic and CD4 Count with oral lesions

Factor	Total n (%)	Oral lesion Yes n (%)	No n (%)	P value
Age (years)				
<10	111 (100)	19 (17.1)	92 (82.9)	0.643
10-15	101 (100)	14 (13.9)	87 (86.1)	
Sex				
Male	89 (100)	12 (13.5)	77 (86.5)	0.643
Female	119 (100)	20 (16.8)	99 (83.2)	
CD4 count				
<200	12 (100)	3 (25.0)	9 (75.0)	0.405
200+	200 (100)	30 (15.0)	170 (85.0)	

Discussion

The results from the current study indicate that the prevalence of oral lesions was low in HIV children on HAART at 15.6%. The most common oral lesions detected was Angular cheilitis (8.1%).No significant association was observed between CD4 count and oral lesions in the current study.

The prevalence and type of oral lesions may vary from region to region. The low prevalence of 15.6% in the present study may be attributed to early initiation and good compliance to HAART. In West Africa, studies were done in three countries and the prevalence of oral lesions in 420 children were 8.8% in Cote d'Ivoire, 8.5% in Mali and 5.0% in Senegal[8]. In Nigeria a prevalence of oral lesion of 51.8% was reported by Oladokun et al[9].

Outside Africa, a study conducted in India on HIV children on HAART revealed that the prevalence of oral lesions was 43%[10]. In Romania out of a study population of 173 children the most common oral and perioral lesions included: candidiasis (29%), ulcers (15% salivary gland diseases (9%), and herpes zoster 1%[11]. In New Jersey, Flanagan's study showed high prevalence of oral lesions (79%) and attributed this high prevalence to insufficient time of having been on HAART for significant immune reconstitution[12].

In this study, Angular cheilitis was the most the common type of oral candidiasis seen in 8.1% of patients which is higher than one reported in studies done in Nigeria 6.9%[7] and Zimbabwe 5%[13]. In a study done in Mozambique angular cheilitis was the most common lesion in 4% of the patients[14].

Parotid enlargement has been recognized as a distinct feature of HIV in children since the disease was first described. It was the second most common lesion (4.2%) in the current study. Parotid enlargement is a predictor of positive prognosis and long term survival in children with HIV[15]. A study done in Mozambique showed a prevalence of parotid enlargement of 23% which is much higher than the 4.3% found in the current study. The use of ART was attributed to the reduced prevalence of parotid enlargement[14]. In Romania out of a study population of 173 children the most common oral lesions included: salivary gland diseases (9%)[11]. In Nigeria, 5.8% of patients had parotid enlargement[9].

The hypothesis that parotid enlargement may come about due to abnormal accumulation of fat caused by Protease Inhibitors inducing peripheral lipody-strophy, is known to be caused by inhibition of two proteins that regulate lipid regulation resulting in hyperlipidaemia that contributes to central fat distribution[16]. In this study the significant prevalence of parotid enlargement does not concur with the hypothesis due to the fact that very few, if any, children found with parotid enlargement were on protease inhibitors.

In the present study the prevalence of oral candidiasis was 1.4% compared to 5.5% found in Mozambique[14]. In India the prevalence of oral candidiasis was 19%[10]. In Romania out of a study population of 173 children the most common oral lesions included: candidiasis (29%)[11]. In this study occurrence of oral lesions did not correlate to levels of CD4 count, contrary to findings in other studies[9,17]. This difference may partly be due to different oral lesions that were observed in patients between studies. In particular we observed Angular cheilities while Oladokun et al[9] did not observe this lesion in their study. In this study, the authors[9] observed that most patients had Pseudomembranous candidiasis which we did not observe in our study. Barasch et al[4] reported a significant correlation between oral candidiasis and CD4 count. However, the finding of no significant association between oral lesions and CD4 count in the current study accords that of Nabbania et al[18] who also reported a high prevalence of pseudomembra-nous candidiasis among their patients.

The limitation in our study was that the lesions were detected clinically and no samples were taken for Laboratory investigations. We did not determine the diagnostic performance of the method used in the current study compared to the recommended WHO method of diagnosis of oral diseases[19]. The population studied was exclusively from urban and peri-urban patients and data can be used for future research. However, the results presented may apply to similar urban and peri-urban populations.

In Zambia, HAART was introduced in 2004. The treatment was primarily to inhibit replication of the viral load, boosting the immune system and preventing and managing opportunistic infections including oral lesions. Introduction of HAART has proved to prolong lives of children and adolescents living with HIV and AIDS[20]. No association was observed between age and drug regimen. However, younger patients were put on 2nd drug regimen partly due to resistance to 1st line drug regimen for unknown reasons.

Conclusions

A low prevalence of oral lesions was observed among children on HAART. Adherence and early initiation on HAART is encouraged in order to maintain the low prevalence of lesions in this population.

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