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Inflammatory Skin diseases in HIV infected children at Ladoke Akintola University Teaching Hospital, Osogbo, Nigeria

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Abstract

Background: Reports on inflammatory skin manifestations of HIV are scarce in Nigerian children, considering the fact that they are common and indicative of underlying HIV disease staging or progression. Thus, the aim of this study was to determine the prevalence, types and distribution of inflammatory skin lesions amongst HIV infected Nigerian children. **Method:** All the children attending the paediatric anti-retroviral clinic of Ladoke Akintola University of Technology (LAUTECH) Teaching Hospital, Osogbo. were studied. Inflammatory cutaneous lesions of HIV were identified from clinical examination. Socio-demographic, clinical and laboratory details were also obtained. Data was analyzed with SPSS version 19 software. **Results:** Of the 102 children studied 25(24.5%) had inflammatory skin lesions. The age of the children studied ranged between 3months and 14years. Papular urticaria, Papular pruritic eruptions, Seborrhoeic dermatitis, Angular stomatitis, Milaria and Acne were found in 9(8.8%), 8(7.8%), 3(2.9%), 2(2.0%), 1(1.0%) and 1(1.0%) cases respectively. Inflammatory skin diseases were significantly reduced among children on HAART compared to those yet to initiate HAART. (P = 0.02, O.R = 0.29, 95% = C.I 0.11 - 0.81). **Conclusion:** Inflammatory skin diseases are not uncommon among the group studied with, papular urticaria and papular pruritic eruptions being the most common inflammatory skin disease in HIV infected children. Administration of HAART is associated with significantly reduced skin disease.

Keywords: Children, Inflammatory, HIV, Dermatoses.

INTRODUCTION

The skin is the largest organ in the body and probably the most frequently affected in patients with HIV/AIDS. Cutaneous manifestations of HIV have been noted in up to 90% of HIV infected populations.[1,2] Skin manifestations of HIV infection can present as a tumour, infection or inflammatory diseases or as a combination of these disorders.[1,2,3]

Reports on the inflammatory skin lesions in HIV infected individuals are scarce. Most of the previous reports on the profile of HIV infected children focused on infectious cutaneous manifestations of HIV. [4,5,6,7] Inflammatory lesions of the skin in HIV infected individuals however usually manifest when the CD4 count falls below 350ul while the infective counterpart usually manifest at CD4 counts less than 200ul. [8] Therefore, with underlying HIV disease progression, inflammatory skin lesions manifest earlier compared with infectious lesions, thus highlighting the importance of inflammatory skin manifestations as an early marker of underlying HIV disease progression.

Inflammatory skin diseases in the HIV infected is currently under researched especially among HIV infected Nigerian children and has never been studied at LAUTECH Teaching Hospital. The desire to pioneer this study at this hospital and the need to provide information on this topic in Nigerian children informed the decision to conduct this study. The present study was conducted at the Anti-retroviral clinic of the LAUTECH Teaching Hospital, Osogbo. The hospital is situated in Osogbo, the state capital of Osun State which had a population of 3.2million at the 2006 census.[9] The hospital provides specialist ambulatory and in-patient services for patients from Osun and the surrounding states such as Ekiti, Ondo, Oyo and Kwara states, which is within a 100km radius. The hospital also has a well-equipped and functional paediatric anti-retroviral clinic that undertakes the care of new and referred HIV infected children at no personal cost.

METHODOLOGY

All the new and old patients attending the paediatric anti- retroviral clinic of the Ladoke Akintola University of Technology Teaching Hospital, Osogbo between 1st of September 2003 and 31st of August 2004 were studied after obtaining consent from their caregivers. All children attending this clinic are children aged 18 months and above, who have previously tested positive to two different rapid HIV screening tests at the point of being enrolled for care. On the other hand, children aged below 18 months are enrolled after testing positive to the Polymerase Chain Reaction (PCR) test for the human immunodeficiency virus.

Information was obtained on consecutive children attending the clinic and recorded in a proforma specially designed for the study by the researcher. Socio- demographic details and other necessary details that may predispose to or prevent the development of skin diseases were obtained on the children studied and documented in the proforma. Thereafter individual comprehensive general and skin examination was conducted for each of the children in a well lit room in order to determine his or her well-being, clinical staging and for the detection of skin diseases.

The clinical staging of the patient was based on the WHO clinical staging. [10] Social economic classification of the patients was based on Oyedejis classification which classifies children into sub- social class I,II,III,IV and V. [II] Children in sub-social class I and II make up the upper social class, while those in IV and V make up the lower class and those in sub-social class III is equivalent to the middle social class. In order to arrive at sub-social class I-V, the occupation and educational attainments of the parents were classified into five groups. The groups the parents fall into are identified and the sum of the four groups for both the mothers and fathers are divided by four to give the sub- social class of the child. The grouping for the educational attainment of the parents are listed below.

Educational groupings

I University and postgraduate training and equivalent

II Polytechnic, School of nursing, Technical Colleges and equivalents

III Secondary school training and equivalent

IV Primary school training and equivalent

V No formal education

Occupational groupings

I Senior public servants, professionals' managers, businessmen and contractors

II Intermediate grade public servants and senior school teachers

III Junior grade public servants, junior school teachers and equivalents

IV Petty traders, hairdressers, labourers, drivers, mechanics and similar grades

V Unemployed, students and subsistence farmers

The results of laboratory tests done on the clinic visit days were also obtained. Specifically, the results of the results of the white blood cell count, pack cell volume the CD4 counts and percentages were recorded. All the data obtained were also recorded in the proforma specifically designed for the study. The data obtained was entered into a computer and analyzed using SPSS version 19. Results for continuous variables were expressed as range, means with standard deviation. Categorical variables were expressed as percentages and associations were determined and significance based on p values less than 0.05. Odd ratios at the 95% confidence intervals were also computed for some associations.

RESULTS

Population studied

A total 102 HIV infected children were studied. The majority of the Children were aged below 5 years. Of the 102 children studied 60 (58.8%) were aged between 3 months and 5 years, 35 (34.3%) were aged >5-10 years and 7 (6.9%) were aged above 10 years. The majority of the children studied were boys. More details on the age and sex distribution are shown in Table 1.

Table 1: Details of population studied: ages, staging, concordance, and socio-demographic data

Age	
Mean (standard deviation)	5.0 (+/-3.2)
Range	3 months – 14 years
Sex	
Male	58(56.9)
Female	44(43.1)
WHO clinical staging of subjects Number(%)	
I	11(10.8)
II	48(47.1)
III	37(36.3)
IV	6(5.9)
Social class	
Upper	23
Middle	27
Lower	52
Parental HIV serostatus	
Corcondant positives	25
Corcondant negatives	1
Sero-disocordant	36
Unknown	40
Caregiver of the subject	
Mother	77 (75.5)
Father	15 (14.7)
Grandmother	4 (3.9)
Aunt	2 (2.0)
Patient	2 (2.0)
Uncle	1 (1.0)
Sister	1 (1.0)

Table 2: Spectrum of Inflammatory skin disease

Inflammatory skin disease	Number of children in whom found (n =102)	Percentage (Number = 102)
Papular pruritic eruptions	9	8.8
Papular urticarial	8	7.8
Seborrhoeic dermatitis	3	2.9
Angular stomatitis	3	2.9
Atopic dermatitis	2	2.0
Milaria	1	1.0
Acne	1	1.0
Kaposis sarcoma	0	0.0
Total	26*	

- *Note one of the children had two dermatoses, thus accounting for 26 skin conditions in 25 children

Table 3: Gender distribution of inflammatory skin disease

Inflammatory skin disease	**Male Number = 58**	**Female Number = 44**	**P value**	**Odds ratio**	**95% confidence interval**
Papular urticaria	6	3	0.79*	1.58	0.32 – 8.55
Papular pruruitic eruptions	6	2	0.48*	2.42	0.41 – 18.41
Seborrhoeic dermatitis	1	2	0.81*	0.37	0.01 – 5.44
Angular stomatitis	1	2	0.81*	0.37	0.01 – 5.44
Atopic dermatitis	0	2	0.36*	0.00	0.00 3.10
Milaria	0	1	0.89*	0.00	0.00 – 13.31
Acne	0	1	0.89*	0.00	0.00 – 13.31

*p with Yates correction

Table 4: Association between inflammatory skin disease and immune status, clinical staging, use of HAART and social class

Variable	**Number with dermatoses (%)**	**Number without dermatoses (%)**	**P value**	**Odds ratio**	**95% confidence interval**
Gender					
Male	14	44	0.92	0.96	0.38 – 2.37
Female	11	33			
WHO clinical stage	Number affected	Number without			
I	5	6	0.01	*	*
II	10	38			
III	7	30			
IV	3	3			
Mean blood counts					
CD4 count (S.D)	737.32 (+/_ 623.03)	791.98 (+/_ 454.96)	*	*	*
WBC Count (S.D)	7369.57 (+/_ 3465.73)	6780.95 (+/_ 1838.05)			
Lymphocyte count (S.D)	3525.76 (+/_ 2310.01)	3567.31 (+/_ 1258.27)			
Eosinophil (S.D)	888.17 (+/_ 772.61)	459.06 (+/_ 380.55)			
PCV Percent (S.D)	31.78 (+/_ 4.32)	32.19 (+/_ 4.25)			
Immune status					
Competent CD4>25%	14(23.0%)	44(77.0)%	0.66	1.23	0.49 – 3.07
Incompetent CD4<25%	11(26.8%)	30(73.2%)			
HAART Administration					
Yes	16(13.0%)	40(87.0%)	0.02	0.29	0.11 – 0.81
NO	19(33.9%)	37(66.1%)			
Sub-social class					
I	1	2	0.38	*	*
II	7	13			
III	3	24			
IV	13	36			
V	1	2			

Prevalence of Dermatoses

Of the total 102 studied 25(24.5%) had non-infectious dermatoses, while 77(75.5%) did not have any form of skin lesion. One (0.04%) of the 25 children with dermatoses had two conditions. Papular urticaria and pruritic popular eruptions were the most common dermatoses. Other dermatoses encountered include seborrheic dermatitis, atopic dermatitis and angular stomatitis. The pattern of dermatoses is found in Table 2.

Age distribution of the skin infection

Most of the dermatoses were found among children aged above 10 years and below 5 years. Of the 60 children in the 0-5-year age bracket 17(28.3%) had dermatoses. The 6 children with dermatoses in the >5-10 years age bracket account for 17.1% of the 35 children in that age bracket. The remaining 2 children with dermatoses in the above 10 years age group with a total population of 7 children represent 28.6% of that age bracket. The differences in the rates of children with and without

dermatoses across these age brackets are not statistically significant (X^2 = 1.56, P = 0.46,)

Sex distribution of Dermatoses

Of the 58 boys, 14(24.1%) had dermatoses, while 11(25.0%) out of the 44 girls studied had skin infections. The differences between the two groups were not statistically significant. (p = 0.92, OR = 0.96, C.I = 0 .38 - 2.37)

Papular uticaria and papular pruritic eruptions were more common among the boys, while seborrheic and atopic dermatitis were more common among the girls. Details on the association between dermatoses and sex distribution are shown in Table 3.

Mode of transmission

Majority of the children studied acquired HIV through vertical transmission. Of the 102 total population 99(97.1%) were infected with HIV vertically while the method of transmission in the remaining 3(2.7%) was presumed to be horizontal, based on the negative retrovirus status of two of the mothers and history of transfusion with unscreened blood in the remaining one of the three children.

Awareness (52.0%) of the 25 children with dermatoses were not hitherto aware of their dermatoses Complaints were made about a rash in 7(28%) out of the 25 with skin rashes. The complaints/symptoms attributed to the rash include pruritus in 4(57.1%), discomfort in 2(28.6%) and pain in the remaining one (14.3%)

Association between complaints of a rash and presence of dermatoses

Approximately half of the children with dermatoses complained of a rash at presentation. Twelve (48.0%) children complained of rashes at presentation amongst the group of 25 with non-infective dermatoses and similar complaints of rashes were received in 21(27.3%) of the remaining 77 children without dermatoses. This association is statistically significant (X^2 = 3.71, P = 0.05).

Pre-hospital medications

Of the 25 children aware of their rashes before presentation, 8 (32.0%) had commenced medications before visiting the health facility. All the drugs administered were not appropriate for the dermatoses. Antibiotics were the most common form of self-medication and Funbacta A was administered in 2 while Ampiclox and Zithromax were administered in one case each. Antiseptics such as Dettol soap and gentian violet were used by 2 and one child. The two remaining children had dustin powder applied to their rashes.

Characteristics of the care givers that accompanied the child to the health facility

Majority of the caregivers that accompanied the children to the clinic for care were the mothers. The fathers, grandmother and other close relatives also brought some of the children to the clinic. More details on the caregiver accompanying the children to the health facility can be found in Table 1. Details concerning the patient and their parents were however provided by the relatives in the situations where the parents did not accompany their wards.

Parents' age

The ages of the fathers ranged from 27 to 71 years and the mean was 44.41(+/-8.89), while the range for the mothers was 25 to 45 with a mean of 33.81 (+/-5.18)

Retroviral status of the parents

Of the 102 mothers studied 100 (98.0%), had a positive retroviral status, while one (1%) had a negative retroviral status and the status of the remaining mother was unknown. Amongst the 102 fathers studied 33(32.4%) are retroviral positive, 43(42.2%) are negative and the status of the remaining 26(25.5) is unknown either as a failure to do the test by the father or failure to disclose the result. Further details concerning the concordance of the retrovirus status of the parents are stated in table 1.

Socioeconomic class of the parents

Most of the fathers had received school education. Of the 102 studied 11(10.8%) received university education, 19 (18.6%) diplomas, 27(26.5%) secondary and 40(39.2%) received primary education. The remaining five (4.9%) fathers had no formal education training respectively. Concerning the mothers their educational training were equivalent to university, polytechnic, secondary and primary school training in 5(4.9%), 17(6.7%), 22(21.6%), 49(48.0%) respectively, while 9(8.8%) had no formal education.

Most of the parents had occupations that fitted into group IV. Thus 12(11.8%), 10(9.8%), 35(34.3%), 43(42.2%) and 2(2.0%) fathers occupied group I,II,III,IV and V respectively, while 2(2.0%), 9(9.8%), 27(26.5%), 51(50.0%) and 13(12.7%) mothers occupied similar group I,II,III,IV and V respectively. The social classes of the children studied can be found in Table 1.

Table 4 shows that the percentage of children with dermatoses. This increased progressively across the sub-social class from, I to V. However the differences across these sub-classes were not statistically significant

DISCUSSION

Inflammatory skin manifestations of HIV affected a sizeable proportion of the population, in the present study, with involvement of at least one in five of the subjects. The reports from previous studies are also consistent with the present report in which both inflammatory and infectious skin lesions are common among HIV infected children, however with infectious lesions predominating. [12,13,14] The prevalence estimate of 24.5% obtained for inflammatory dermatoses in the present study is smaller than the 41% and 44.8% obtained in Ibadan, South West Nigeria and Ethiopia respectively. [13,14] The differences in geographic locations may possibly explain the differences in prevalence estimates.

There was no significant difference in the distribution of inflammatory lesions across the age groups or sexes in the present study. However inflammatory skin lesions were least common in the 5-10 year old age bracket and most common in the age above 10 years. Previous studies have also not documented any association between the ages of the children and skin manifestation. Although there was no statistically significant difference between the rates of skin lesions among boys and girls, popular pruritic eruptions and papular urticaria were more common among boys. The results in the present study are consistent with findings from previous studies.[2,13,14,15] Reaction to insect bites, which is believed to be responsible for papular urticaria is common in tropical countries .Boys are likely to have greater exposure to bites because they are usually more adventurous, and this may explain the predilection of this lesion for boys. A connection between papular pruritic eruption and urticarial is hereby postulated for the similar predilection for the male gender.

Papular urticaria was the most common inflammatory eruption documented in the present series. Insect bites are very common in the tropics and they manifest as cutaneous wheals in both HIV infected and uninfected individuals thus, diminishing the predictive value of this skin disease as a role marker of underlying HIV disease. Papular pruritic eruption on the other hand has been found to be associated with a fast disease progression amongst HIV infected children, while seborrhoeic dermatitis is an early cutaneous manifestation of HIV. [16,17] The present study did not follow up the disease progression amongst those with papular pruritic eruptions. It will however be necessary to investigate this association further with a view of determining the specific etiology and preventing or delaying its development. In the early days of anti-retroviral therapy in Nigeria Initiation of HAART was presently recommended at stage II when CD4 count is higher than 350cells/ul, however currently all stages in children should initiate treatment. [10]

Angular chelitis and atopic dermatitis were documented in less than 5 percent of the population in the present study thus suggesting that they are uncommon mucocutaneous findings in HIV infected children. The low prevalence of atopic dermatitis and angular chelitis in the general Nigerian population may explain the low prevalence of these two skin conditions. A study in Nigeria showed atopic dermatitis to be almost non-existent, while angular chelitis occurred in 2.5% of the 1066 of the primary school children studied. [18] Previous studies also show that both angular chelitis and atopic dermatitis are uncommon among HIV infected children. [12,14] Risk of atopic dermatitis is however increased among HIV infected children and the diseases more troublesome and difficult to manage among infected children.[19]

Milaria and acne accounted for less than 3 percent of the inflammatory dermatomes. Previous studies on inflammatory skin disorders in HIV infected children did not record these disorders in addition these studies stated no link between these disorders and HIV infection. Thus, it is postulated that the coexistence of these disorders is casual rather than causal.

The percentage of children with inflammatory skin disorders amongst the immune suppressed were higher compared with those not immune suppressed in the present study, however this association was not statistically significant. On the other hand, there was a significant reduction in the percentages of children with cutaneous inflammatory disorders amongst those on HAART, thus suggesting that immunity and HAART may play a protective role against the development of skin disorders. Previous reports by other researchers also support this finding. [20,21]

CONCLUSION

Inflammatory cutaneous lesions were common in the present study with the affectation of at least one in five of the children studied. Papular urticaria and papular pruritic eruptions were the most common inflammatory skin disorders recorded in the present study. Administration of HAART may have a protective effect against inflammatory skin disorders due to the significant reductions in inflammatory dermaotoses recorded amongst those on HAART.

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