

RESEARCH NOTE

Open Access



Patterns of common skin infections among children living with HIV/AIDS in Hawassa City, Ethiopia: a cross sectional study

Bereket Duko^{*} , Melese Gebrie, Bedilu Deribe, Asres Bedaso and Mohammed Ayalew

Abstract

Objectives: Skin disorders are the most common health problems seen among HIV positive patients. It presents with a variety of manifestations which can cause significant morbidity. This study was aimed to assess the prevalence of common skin problems among children living with HIV/AIDS at Hawassa University Comprehensive Specialized Hospital, Hawassa, Ethiopia, 2017/2018. Hospital based cross-sectional study was conducted among 125 children living with HIV/AIDS who were recruited through simple random sampling techniques from February to April 2017. Pre-tested, structured questionnaires were used to collect the data.

Result: Among a total of 125 study participants, 72 (57.6%) of the children were males and 97 (77.6%) were in the age range of 10–14 years. 90 (72%) of participants had different kinds of skin problems. Among those who had one kind of common skin infection, 53 (42.4%) were males. Viral skin infections that accounts 48 (53.3%), were the leading cause of skin infections followed by 43 (47.8%), 33(36.7%) and 22 (24.7%) fungal infections, inflammatory and bacterial skin infections respectively. Among all children who were taking ART, only 2.4% of the children had skin related side effects.

Keywords: Pattern, Skin infection, Children, HIV/AIDS, Ethiopia

Introduction

HIV/AIDS is the most common and serious viral disease caused by human immunodeficiency virus (HIV) that affects about 39–46 million people in the world [1, 2]. Most reside in the developing world, with approximately two-third in sub-Saharan Africa and nearly 12% of these infections occurred in children younger than 15 years of age [3]. The USA and Europe have documented transmission rates in untreated women between 12 and 30%. Transmission rates in Africa are higher that ranges from 25 to 52% [4].

Skin infections account the most common clinical manifestations in children. About 90% of patients develop at least one type of skin disease during the course of their illness and more than one-third of patients present with skin lesions as a marker of HIV infection [5]. Skin and

mucocutaneous infections such as herpes simplex infection, candidiasis, impetigo, ecthyma and furuncles, molluscum contagiosum, plane warts, seborrheic eczema and Kaposi's sarcoma etc. are common skin infections among people living with HIV/AIDS [2]. Skin disorders in children living with HIV/AIDS may have atypical presentation, be inclined to be more severe and may diagnosed wrongly [6].

Children living with HIV can develop different infectious and inflammatory diseases of the skin. These skin or mucocutaneous disorders may provide an early clue to the presence of pediatric HIV infection and often more severe and more difficult to treat than in the immunocompetent child. Skin disorders are common in children in Ethiopia, where nearly four out of five (72.6–79%) children living with HIV/AIDS develop at least one skin type infection [6, 7].

Immune reconstruction induced by anti-retroviral therapy (ART) would be anticipated to decrease the prevalence of many opportunistic infections including

*Correspondence: berkole.dad@gmail.com
Faculty of Health Sciences, College of Medicine and Health Sciences,
Hawassa University, Hawassa, Ethiopia



skin disorders due to inhibition of viral replication [8]. Hence, skin infections are major health problems among children living with HIV presenting with a variety of dermatologic manifestations. In this study, our aim was to assess pattern of skin infections among children living with HIV/AIDS.

Main text

Study design and setting

This descriptive cross-sectional study was conducted among children living with HIV/AIDS at Hawassa University comprehensive specialized hospital, ART clinic from February to April 2017. The sample size was calculated using a single population proportion formula was used to calculate required sample size. A total of 270 children were registered in ART registry and actively taking ART drugs. Among those children who fulfilled the inclusion criteria, total of 125 children living with HIV/AIDS were recruited using simple random sampling techniques by computer generated number using the ART registry number as sampling frame.

Data collection

Interviewer administered structured and pre-tested questionnaires were used to collect the data. The questionnaire had four parts such as socio demographic data of the child, socio demographic data of the care giver, ART Treatment related factors and skin problems in children related questions. A standardized clinical history was documented and all participants undertake a comprehensive dermatologic examination by the dermatologists and expert nurse clinicians, as part of a full clinical evaluation including WHO staging. Clinical dermatological evaluation was done in daylight and majority of the diagnoses of skin infections were done clinically. Laboratory tests that are appropriate to diagnose skin infections

like KOH, gram stain, culture and sensitivity were done to affirm the diagnosis, when necessary.

Data analysis

Data were checked for completeness and consistency, then entered and cleaned using Epi-Data version 3.0. Statistical analysis was done using the Statistical Package for Social Sciences (SPSS) program version 20. Results were expressed as means and standard deviations and frequencies and percentages.

Result

Socio-demographic characteristics of the children

Among a total of 125 study participants, 72 (57.6%) of the children were males and 97 (77.6%) were in the age between 10 and 14 years. 91 (75.8%) of the children’s were attending primary education (grade 1–8) and majority 88 (70.4%) of the children were fully immunized their vaccination (Table 1).

Socio-demographic characteristics of the care takers

Out of 125 caretakers of children, 96 (76.8%) were female, 65 (52%) were in age group 25–34 years, 114 (91.2%) were from urban residence, 42 (33.6%) and 38 (30.4%) of caretakers were Amhara and Oromo by ethnicity, respectively (Table 2).

Prevalence of common skin infections

Out of all study participants, 90 (72%) had different kinds of skin problems. Of those patients who had at least one kinds of common skin infection, where 53 (42.4%) were males and 37 (29.6%) were females (Fig. 1). Among all study participants, majority 107 (85.6%) of the study participants were currently on WHO clinical stage I and, 114 (91.2%) of the children’s had been taken ART drugs for greater than or equal to 6 months. 70 (56%) of the study

Table 1 Socio-demographic characteristics of the children living with HIV/AIDS in Hawassa Comprehensive Specialized Hospital, Hawassa, Ethiopia, 2018 (N = 125)

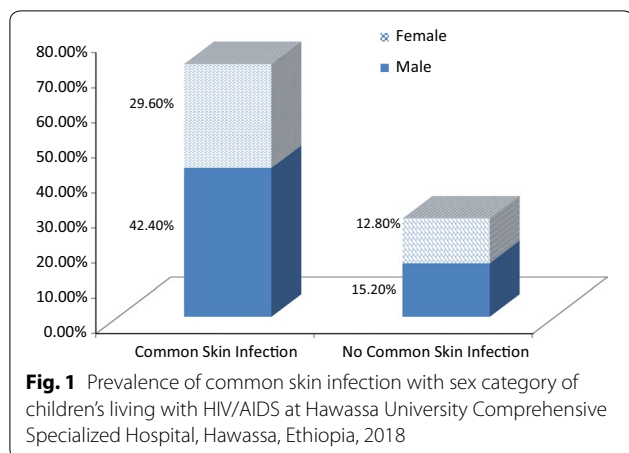
Variables	Categories	Number	Percent (%)
Age	0–4 years	4	3.2
	5–9 years	24	19.2
	10–14 years	97	77.6
Sex	Male	72	57.6
	Female	53	42.4
Level of education (N = 121)	Kindergarten education	4	3.3
	Primary education	91	75.2
	Secondary education	26	21.5
Immunization status	Fully immunized	88	70.4
	Immunized some	33	26.4
	Non-immunized	4	3.2

Table 2 Socio-demographic characteristics of care taker of children living with HIV/AIDS in Hawassa University Comprehensive Specialized Hospital, Hawassa, Ethiopia, 2018 (N = 125)

Variables	Categories	Number	Percent (%)
Age	15–24 years	13	10.4
	25–34 years	65	52.0
	35–44 years	34	27.2
	≥ 45 years	13	10.4
Sex	Male	29	23.2
	Female	96	76.8
Residence	Urban	114	91.2
	Rural	11	8.8
Marital status	Single	10	8.0
	Married	104	83.2
	Divorced	5	4.0
	Widowed	6	4.8
Religion	Orthodox	60	48.0
	Muslim	19	15.2
	Protestant	43	34.4
	Catholic	3	2.4
Ethnicity	Amhara	42	33.6
	Oromo	38	30.4
	Sidama	22	17.6
	Wolayita	17	13.6
	Others	6	4.8
Family size	2–4	88	70.4
	5–7	33	26.4
	≥ 8	4	3.2
Level of education	Illiterate	11	8.8
	Read and write	27	21.6
	Primary education completed	37	29.6
	Secondary education completed	29	23.2
	College/University completed	21	16.8
Occupation	Merchant	22	17.6
	Gov't employee	28	22.4
	Self-employee	39	31.2
	Daily laborer	20	17.6
	Farmer	6	4.8
	Student	5	4.0
	Other	5	4.0
Average monthly income	> 1500 EBR	32	25.6
	700–1499 EBR	60	48.0
	< 700 EBR	27	21.6
	Non specified	6	4.8
Family history of skin infection	Yes	19	15.2
	No	106	84.8

subjects were taken first line ART drug. Regarding drug adherence, 115 (92.0%) and 113 (90.4%) of the study participants had drug dose and schedule adherence respectively. Among all children who were taking ART, only 2.4% of the children had skin related side effects. Viral

skin infections which accounts 48 (53.3%) were the leading cause of skin infections followed by 43 (47.8%), 33 (36.7%) and 22 (24.7%) fungal infections, inflammatory and bacterial skin infections, respectively (See Additional files 1, 2 and 3).



Discussion

The aim of this study was to assess the pattern of skin problems among children living with HIV/AIDS attending in Hawassa University comprehensive specialized hospital, Hawassa, Ethiopia. Thus, skin and mucocutaneous infections can be the early indication of HIV-associated compromised immune system [2, 9]. Therefore, identification of these HIV-related skin problems may possibly lead to early diagnosis of HIV infection and ending with timely initiation of appropriate ART [2].

This study showed that 72% of children had at least one type of skin disorders. Similar to our study, high prevalence of skin and mucocutaneous infections has been reported in Addis Ababa, 72.6% and 79% [6, 7], in Cameroon (68.8%) [10], in Nigeria (72%) [11], and India (67.06%) [9]. Nevertheless, the finding lower than studies from Tanzania (85%) [12], Zimbabwe 88% [13] and, India 93.7% [14] and (88.3%) [15] and higher than a study conducted in Guinea (54.62%) [16]. The variations might be due to the occurrence and pattern of skin infections vary from region to region since specific skin manifestation are common in certain regions of the world [17]. In addition, differences in climatic and environmental circumstances [14], self-care and sanitation, and variation in sample size in the different studies may affect the varied results observed.

Viral skin infections which accounts for 53.3% were the leading cause of skin infections followed by fungal infections which accounts for 47.8% and inflammatory related skin infections (36.7%). This finding is in line with a study from India where viral, fungal and bacterial skin infections took the highest prevalence [18]. The higher prevalence of these infectious dermatosis is due to the weakening of the Langerhan's cells responsible for the mucocutaneous immunological system [19]. There has been a remarkable reduction in the opportunistic

infections such as skin infections like oral candidiasis and seborrheic dermatosis with the introduction of Highly Activated Antiretroviral Therapy (HAART) [20]. However, some skin problems have paradoxically exacerbated after beginning of HAART like herpes zoster, mycobacterium infections and drug reactions [21].

Infectious dermatosis is the most common cause of skin infections. Hence, in our study the most common infectious dermatosis was candidiasis (32.2%) and among non infectious dermatosis, pruritic papular eruption (PPE) (20%) accounts highest prevalence.

Conclusion

This study revealed that high prevalence of mucocutaneous disorder in HIV infected children. Most of the mucocutaneous disorders were secondary to infectious causes and drug related inflammatory condition. Children with advanced immune-suppression are suffering from a wide spectrum of muco-cutaneous disorders. Thus, thorough evaluations of children are recommended in HIV care and treatment centers to address these problems.

Limitations of the study

The study conducted only descriptive part. Lacking detailed analysis on associated factors is the limitation of the study.

Additional files

Additional file 1. Distribution of specific skin infection as per common skin infection category of children's living with HIV/AIDS at Hawassa University Comprehensive Specialized Hospital, Hawassa, Ethiopia, 2018.

Additional file 2. HIV/AIDS clinical staging and ART related characteristics of the children living with HIV/AIDS in Hawassa University Comprehensive Specialized Hospital, Hawassa, Ethiopia, 2018 (N = 125).

Additional file 3. Association of common skin infections category, Specific CSIs and their determinant factors of the children living with HIV/AIDS in Hawassa University Comprehensive Specialized Hospital, Hawassa, Ethiopia, 2018 (N = 125).

Additional file 4. Written informed consent form for the study.

Authors' contributions

BD, MG and BDe were conceived the study and were involved in the study design, reviewed the article, analysis, report writing. AB and MA were involved analysis, report writing and, BD and MA drafted the manuscript. All authors read and approved the final manuscript.

Acknowledgements

The authors appreciate the respective study institutions & the study participants for their cooperation in providing all necessary information.

Competing interests

The authors declare that they have no competing interests.

Availability of data and materials

All relevant data are within the paper.

Consent for publication

Not applicable.

Ethical approval and consent to participate

Ethical clearance was obtained from the institutional Review Board (IRB) of the College of Medicine and Health Sciences at Hawassa University. Permissions to undertake the study were also obtained from relevant authority of the hospital and the study subjects that were involved in the study. Both oral and written consent from the guardian or parent was obtained and confidentiality has been assured. The nature of the study was explained to the study participants about the research to the respondents prior to data collection. In addition, confidentiality of all information's was ensured. No resistance was made if a respondent wants to withdraw from the research at any time (see Additional file 4).

Funding

No funding was received for this study.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Received: 9 November 2018 Accepted: 5 December 2018

Published online: 12 December 2018

References

- Sepkowitz KA. AIDS—the first 20 years. *N Engl J Med*. 2001;344(23):1764–72.
- Aljehawi NA, Bugrein OO, Grew A, Duweb GA. Cutaneous manifestations in HIV infected Libyan patients. *Serbian J Dermatol Venereol*. 2017;9(3):113–8.
- UNAIDS. Global AIDS epidemics. Geneva: UNAIDS; 2012.
- Yogev R CE. Acquired immunodeficiency syndrome (human immunodeficiency virus). 2000.
- Harmainder S et al. Skin infection in children with HIV/AIDS. *Indian J Dermatology*. 2016.
- Endayehu Y, Mekasha A, Daba F. The pattern of mucocutaneous disorders in HIV infected children attending care and treatment in Tikur Anbesa specialized hospital, Addis Ababa. *BMC Dermatol*. 2013;13:12.
- Doni SN, Mitchell AL, Bogale Y, Walker SL. Skin disorders affecting human immunodeficiency virus-infected children living in an orphanage in Ethiopia. *Clin Exp Dermatol*. 2011;37:15–9.
- Seoane RE, Bellon JM GD, et al. Role of antiretroviral therapy in mucocutaneous manifestations in HIV infected children over a period of two decades. *Br J Dermatol*. 2005;13:382–9.
- Poi RR, Vanaki RN, Yelamali BC, Badakali AV. Pattern of muco-cutaneous manifestations in HIV infected children at tertiary care hospital, north Karnataka, India. *Int J Contemp Pediatr*. 2015;2(4):419–23.
- Mbuabgaw J, Eyong I, Alemnji G, Mpoudi N, Same-ekobo A. Patterns of skin manifestations and their relationships with CD4 counts among HIV/AIDS patients in Cameroon. *Int Soc Dermatol*. 2004;2001:2002–6.
- Shittu RO, Salami AK, Odeigah LO, Mahmoud AO, Adeniran SA, Nyamnggee AA, et al. Prevalence and pattern of dermatological lesions in relationship to CD4 cell counts among newly diagnosed HIV patients in Nigeria, West Africa. *World J Life Sci Med Res*. 2013;3(1):26–32.
- Endayehu Y, Mekasha A, Daba F. The pattern of mucocutaneous disorders in HIV infected children attending care and treatment in Tikur Anbesa specialized hospital, Addis Ababa. *BMC Dermatol*. 2013;13(1):1.
- Lowe S, Ferrand RA, Morris-jones R, Salisbury J, Mangeya N, Dimairo M. Skin disease among Human Immunodeficiency Virus-infected adolescents in Zimbabwe: a strong indicator of underlying HIV infection. *Pediatr Infect Dis J*. 2012;29(4):346–51.
- Premanadham N, Reddy PS. Original research article HIV patients with dermatological manifestations correlated with CD4. *Int J Curr Microbiol App Sci*. 2015;4(2):575–81.
- Malkud S, Dyavannanavar V. Mucocutaneous manifestations of HIV infection. 2016;2(September):84–7.
- Soumah MM, Bangoura MA, Keita M, Tounkara TM, Diané BF, Sylla D, et al. Skin manifestations of HIV infection in children in pediatric services of Conakry University Hospital (Guinea). *J Cosmet Dermatol Sci Appl*. 2018;8:39–46.
- Sivayothorn A, Srihra BLW. Prevalence of skin disease in patients infected with Human Immunodeficiency Virus in Bangkok, Thailand. *Ann Acad Med Singapore*. 1995;24:528–33.
- Puttaiah S, Hospital M. A hospital based cross sectional study of mucocutaneous manifestations in the HIV infected A hospital based cross sectional study of mucocutaneous manifestations in the HIV infected. *Int J Collab Res Intern Med Public Health*. 2015;2(3):50–78.
- Panya MF, Mgonda YM, Massawe AW. The pattern of mucocutaneous disorders in HIV-infected children attending care and treatment centres in Dar es Salaam, Tanzania. *BMC Public Health*. 2009;5:5–9.
- Donic I, Vesic SJD. Oral candidosis and seborrheic dermatitis in HIV infected patients on highly active antiretroviral therapy. *HIV Med*. 2000;5:50–4.
- Sotto A, Guillot B, Dandurand MJJ. Exacerbation of skin mycobacterial lesions under highly active antiretroviral therapy in an HIV-infected patient. *AIDS*. 1999;13:1790–1.

Ready to submit your research? Choose BMC and benefit from:

- fast, convenient online submission
- thorough peer review by experienced researchers in your field
- rapid publication on acceptance
- support for research data, including large and complex data types
- gold Open Access which fosters wider collaboration and increased citations
- maximum visibility for your research: over 100M website views per year

At BMC, research is always in progress.

Learn more biomedcentral.com/submissions

