

Original article

**Risk Factors Among People Living With HIV(PLWHIV)Attending
Wad Medani VCT/ART Center, Gezira State, Sudan**

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Abstract:

Introduction: HIV is a global health burden, there is a great concern towards its risk factors to aid the prevention of this stigmatizing serious disease.

Objectives: This observational, prospective, cross-sectional health facility based study was conducted among people living with HIV in Gezira State central Sudan, to identify the risk factors among people living with HIV/AIDS.

Materials & Methods: The study was carried among HIV-infected patients attending Wad Medani VCT/ART Center from December 2010 to March 2011. Participants were interviewed using a structured questionnaire to record the socio-demographic characteristics, and risk factors for HIV infection.

Observation & Results: A total of 50 subjects were enrolled with a mean age of 36.39+13.57years, 52% were males, 56% were WHO stage III, 36% were WHO stage IV, while stage II and one were reported in 4%. The risk factors for acquisition of HIV among study subjects showed: history of dental extraction in more than one-third 18(34%), followed by surgical operation in 16(32%), scarification in 10(20%), blood transfusion in 9(18%), tattooing in 5 (10%) and needle stick injury in 1(2%). No correlation was observed between these factors and the acquisition of HIV apart from heterosexual sex ($P > 0.05$), heterosexual sex was reported in 66.7%, while 5.6% practice sex with the same gender.

Conclusion: This study shows that the heterosexual sex was the commonest mode of transmission among HIV-infected subjects, other risk factors were found to have no significant effect, and the majority of patients had advanced disease presentation.

Key Words: HIV Epidemiology, risk factors, heterosexual transmission, Sudan.

Introduction:

Sudan is surrounded by countries with high rates of HIV infection (The HIV belt). The first HIV case was reported in 1986, and by 2011 the total number of the reported cases had crept to 2218.⁽¹⁻³⁾ In 2002 an epidemiological and a behavioral survey was conducted by Sudan National AIDS Program(SNAP)and reported a prevalence of 1.6% of HIV among the general population^(1,4). In spite of being the largest study, it carried a lot of limitations by including both general and at-risk populations⁽⁴⁾. The most recent estimate of the prevalence of HIV/AIDS in Sudan after separation of South Sudan was indicated to be around 0.4%⁽⁵⁾.

The AIDS epidemic in Sudan is unevenly spread across the formerly unified Sudan. According to a recent overview ⁽⁶⁾, the epidemic is concentrated in the Southern part of the country, which recently became the Republic of South Sudan. Years of civil war and limited epidemiological data in Sudan make a robust assessment of the nature and dynamics of the epidemic difficult. In 2009, UNAIDS estimated HIV prevalence in Sudan to be 1.1 (0.9-1.4%) percent ⁽⁷⁾, with 260,000 (210,000 – 330,000) people living with HIV (PLHIV). Unfortunately, no separate estimates for Northern/Southern Sudan, rural/urban areas or individual states were included in the report.

Although Sudan is among the countries with lowest HIV/AIDS prevalence in Sub-Saharan Africa, the prevention efforts are still lagging behind. The HIV/AIDS test coverage was only 1% for Sudanese population, as indicated by the Sudan House Hold Survey (SHHS) in 2010 ⁽⁴⁾.

The spread of HIV is influenced by illiteracy and poverty; both of them are abundant in Sudan. Furthermore, the movement of the displaced people due to the war could increase the rate of HIV/AIDS cases, also; Sudan is by far a conservative and a religious society where sexual aspects are not openly discussed to aid preventive measures. A study published in Sudan ⁽⁸⁾ reported poor HIV/AIDS comprehensive correct knowledge among University students. Thus we conducted this research to examine the main factors associated with HIV/AIDS infection among people living with HIV in Gezira of central Sudan.

Materials and Methods:

Study Area:

The study was conducted in the Voluntary Counseling and Testing (VCT)/Antiretroviral Therapy (ARV) Centre, which is located in Wad Medani Teaching Hospital. The center was established in 2005, according to the WHO as a VCT to provide confidential testing and counseling for clients and suspected cases, health care, treatment, and follow-up. In January 2006, the Center started to provide antiretroviral therapy (ART).

Study design and technique:

The study was an observational, prospective, cross-sectional hospital based carried out in the period from December 2010 to March 2011, Wad Medani VCT/ART center.

Study population:

HIV positive clients and patients (having their blood tested by ELISA, Biorex, UK) and coming for regular follow-up, and agreed to participate were approached in a ratio of 1:1 making a total of 50 cases. Those who had negative tests for HIV were excluded from the survey. Participants were then interviewed using a structured questionnaire to collect socio-demographic data, needle stick injury, surgical operation, dental extraction, scarification, and tattooing.

Data Analysis:

Data were analyzed by using the Statistical Package for Social Sciences (SPSS) version 17.0. Comparison and characteristics between variables were performed using the Chi-square test (χ^2). *P*-value less than 0.05 was considered as significant. Results were tabulated and presented in simple percentage forms.

Ethical Clearance:

Informed consent was obtained from all study subjects or the parents when children were tested; no names were taken from subjects and confidentiality was ensured. Similarly, permission was received from the State Coordinator of SNAP. Ethical clearance for the study was then obtained from Ethical Clearance Committee of the Faculty of Medicine, University of Gezira.

Observation & Results:

Out of fifty participants, 26(52%) were males, 24(48%) were females, and 3(6%) were children, with an age range between 3-65 years and a mean age of 36.39±13.57 years. Most of the study subjects 43(86%) lie between 16-55 years. Table (1). Twenty-one (42%) were married, 13(26%) were single, and 16(32%) were either widowed or divorced. The majority of the study subjects 30(60%) were coming from the central Sudan, 6(12%) from the West, 5(10%) from the East and the rest 5(10%) were from Northern Sudan. Table (2). Concerning the level of education: 17(34%) had primary school education, 14(28%) were illiterates, 9(18%) had higher school education, 7(14%) had a university education, and 3(6%) had Khalwa education. Table (3).

Table (1): Showing the distribution of patients according to their age (n=50)

Age group	Male	Female	Total
1_____15	3	-	3
16_____25	2	4	6
26_____35	8	6	14
36_____45	7	10	17
46_____55	4	2	6
56_____65	2	2	4

Table (2): Showing the distribution of patients according to their origin (n=50).

Origin	Total	Percent
Central	30	60%
East	5	10%
West	7	14%
North	1	2%
Foreigner	7	14%
TOTAL	50	100%

Table (3): Showing the distribution of patients according to their level of education (n=50).

education Level of	Male	Female	Total
Primary school	10	7	17
High Secondary school	5	4	9
Illiterate	5	9	14
University	4	3	7
Khalwa	2	1	3
TOTAL	26	24	50

When the World Health Organization (WHO) staging system was applied: 29 patients (58%) were found to have WHO stage III, 16(32%) were stage IV, while stage I and two were found in(4%) of participants. Table (4).

Table (4): Showing the distribution of patients according to WHO staging system (n=50).

Stage	Total	Percent
WHO I	2	4%
WHO II	2	4%
WHO III	29	58%
WHO IV	16	32%
Total	50	100%

Risk factors for acquisition of HIV among study subject showed: history of dental extraction in 18(34%), surgical operation in 16(32%), scarification in 10(20%), blood transfusion in 9(18%), tattooing in 5(10%)and needle stick injury in 1(2%).However, all of them showed a significantly low level, $P > 0.05$ Table (5).Extramarital sexual activity was reported in 18/50(36%), 12 of them(66.7%)had heterosexual sex, while one (5.6%) had sex with men. Heterosexual sex was found to carry a significant risk for acquisition of HIV, $P=0.001$.See Table (6).

Table (5) showing the risk factors for acquisition of HIV. (n=50).

Sex	Male	Female	Total
Risk factor			
<i>Surgery</i>	6	10	16
<i>Blood transfusion</i>	4	5	9
<i>Dental treatment</i>	10	8	18
<i>Scarification</i>	6	4	10
<i>Tattooing</i>	2	3	5
<i>Needle stick injury</i>	1	0	1

$P > 0.05$

Table (6) showing extra-marital relationships among the study subjects¹

Sexual behavior	Frequency	Percent
Single partner	3	16.7%
Multiple partners	2	11.1%
Male/female(heterosexual)	12	66.7%
Female/female	1	5.6%
Total	18	100%

P=0.001

¹The percentages were taken from a total of 18 subjects

Discussion:

Sudan is a very conservative Muslim community⁽⁸⁾, in which people with HIV are seen as a real stigma. This stigma towards people with HIV is due to poor knowledge about the disease transmission⁽⁹⁾, and it is linked to low levels of education. The data of Issam⁽¹⁰⁾ at Omdurman supported the current observation where most of the infected subjects were illiterate or had a low level of education. Poor knowledge towards HIV/AIDS towards public health education is due to poor governmental commitment and the weak role of the media.

A total of 50 participants, who met theselectioncriteria, were enrolled in the study. HIV infection among females was found to have nearly the same percentage as in males (48% Vs. 52%).In contradiction to the study of Badredin et al.⁽⁸⁾ which was done at Omdurman VCT Centre, that showed a male to female ratio of52.4:47.6.The data was conforming to the survey of Issam et al.⁽¹⁰⁾ in that males were outnumbering women in Khartoum State VCT Centers. But after all is wassimilar to the global epidemiological statistics, despite the initial description of the disease among men who have sex with men (MSM) in the United States, more than 80 percent of infections occur through heterosexual transmission, and over 50 percent of all HIV-infected people in the world are women⁽¹¹⁾. A serosurvey study of the prevalence of HIV was carried out in Port Sudan, during 1987 on 593 subjects who practiced a high-risk behavior;including sexual promiscuity, showed a high prevalence HBV (80%) and none of them was HIV-positive⁽¹²⁾.

Children were not excluded from HIV infection. In this study 3 (6%) were children, this pool in the global epidemics of HIV among children. As of December 2005, approximately 2.3 million children were living with human immunodeficiency virus (HIV) infection globally; 570,000 children died secondary to HIV-associated disease during 2005 alone. (WHO/UNAIDS Geneva, Switzerland, 2002)in agreement with the data of Issam⁽¹⁰⁾ who showed a percentage of 2 to 5%. Most of the study subjects 43 (86%) were in the age group between (16 -55 years), and this result is nearly similar to the epidemiological facts about HIV,it is most common among adults and children⁽¹³⁾.Interestingly it was conforming to the local data of Issam and Badredin⁽⁸⁾ The majority 30 patients (60%) were from central Sudan, 6 (12%) from western Sudan, 5 (10%) from eastern Sudan, 1 (2%) from northern Sudan and 4 (8%) were Africans immigrants. This is governed by the fact that the center is located in Wad Madani city, where it is connected to the different parts of the country by national highways. World Health

Organization (WHO) staging system. Showed that most of the patients 29 patients (58%) were WHO stage III and 16 (32%) were stage IV, which was considered late stages of the disease⁽¹⁴⁾. The delayed presentation is probably due to lack of health education, patients self-referral and the problem of the social stigma, as well as to the behavior of the disease itself, as it mimics many other diseases that make it a late suspicion.

Risk factors for HIV acquisition among the study population showed a significant heterosexual behavior among 66.7%. This is consistent with the local data (SNAP) and nearly similar to the regional rates for HIV acquisition in sub-Saharan countries. In a study performed by more than 4000 men and women from Rwanda and Zambia, who underwent voluntary counseling and testing for HIV, an estimated 55 to 93 percent of new heterosexually acquired HIV infections among adults occurred within serodiscordant marital or cohabiting relationships⁽⁴⁾. Little is known about the overall prevalence of male same-sex behaviors in African societies, although there has been a surge in research in this area⁽¹⁵⁾. A prospective interventional study was conducted among 70 of the displaced in Port Sudan by Magda et al., to determine the effect of health education in improving their knowledge, attitude and behavior towards HIV/AIDS. The study revealed that unsafe sex has dropped from 97.1% to 87%, and the use of condom has increased from 35.7% to 44.3%⁽¹⁶⁾.

Conclusion:

It can be concluded that the heterosexual sex was the commonest mode of transmission among HIV-infected subjects, and the majority of patients had advanced disease presentation. Health education is highly needed to protect against HIV, and to decrease the rate of the late presentation of HIV-infected subjects.

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References:

1. Sudan National AIDS Program (SNAP), Situation Analysis, Behavioural and Epidemiological Surveys and Response Analysis, Sudan, FMOH SNAP, 2002.
2. UNAIDS: 2009 AIDS epidemic update. UNAIDS/09.36E/JC1700E. Geneva, Joint United Nations Programme on HIV/AIDS AND World Health Organization, November 2009.
3. Centers for Disease Control and Prevention (CDC). The Global HIV/AIDS pandemic, 2006. MMWR Morb Mortal Wkly Rep 2006; 55:841.
4. Dunkle, KL, Stephenson, R, Karita, E, et al. New heterosexually transmitted HIV infections in married or cohabiting couples in urban Zambia and Rwanda: an analysis of survey and clinical data. Lancet 2008; 371:2183.
5. Smith AD, Tapsoba P, Peshu N, et al. Men who have sex with men and HIV/AIDS in sub-Saharan Africa. Lancet 2009; 374:416.
6. Abu-Raddad LJ, Hilmi N, Mumtaz G, Benkirane M, Akala FA, Riedner G, Tawil O, Wilson D. Epidemiology of HIV infection in the Middle East and North Africa. AIDS, 2010. 24 Suppl 2: p. S5-23.
7. UNAIDS & WHO. *Epidemiological Fact Sheet – Sudan*. 2011.

8. Mohamed BA, Mahfouz MS. Factors Associated with HIV/AIDS in Sudan. *Biomed Res Int.* 2013; 2013: 971203
9. Elbadawi AS, Mirghani HO. Assessment of HIV/AIDS comprehensive correct knowledge among Sudanese University: Across-sectional analytic study 2014. *he Pan African Medical Journal.* 2016;24:48. doi:10.11604/pamj.2016.24.48.8684
10. Issam AW Mohamed. Empirical Data Analysis of HIV/AIDS in Sudan with Reference to Khartoum State. *Econometrics, Data Collection and Data Estimation Methodology Journal*, Vol. 4, Issue 45, June 27, 2011
11. Beyere, C. HIV epidemiology update, and transmission factors: risk and risk context – 16th International AIDS Conference epidemiology plenary. *Clin Infect Dis* 2007; 44:981.
12. Burans JP, McCarthy M, El Tayeb SM et al. Serosurvey of prevalence of human immunodeficiency virus amongst high risk groups in Port Sudan, Sudan. *East Afr Med J.* 1990;67:650–5.
13. UNAIDS: 2009 AIDS epidemic update. UNAIDS/09.36E/JC1700E. Geneva, Joint United Nations Programme on HIV/AIDS AND World Health Organization, November 2009.
14. Participant Manual For the basic ART. Clinical Training Course. WHO- June 2004.pp 24.
15. Harania RS, Karuru J, Nelson M, Stebbing J. HIV, hepatitis B and hepatitis C co- infection in Kenya. *AIDS.* 2008;22:1221–2.
16. Elhadi AM, Suliman AL. The Effect of Health Education in Raising the knowledge and Attitude among the Displaced children towards HIV/AIDS IN Port Sudancity. *Gezira Journal of Health Sciences* 2011;7(2):56-22.[In Arabic].
17. Issam AW Mohamed. Surveying HIV/AIDS Epidemic in Khartoum State with Reference to Economic Impacts. *Health Economics Journal*, Vol. 3, No. 43, April 2011