

Unknown HIV Infection Prevalence and Associated Factors: Findings from A University Teaching Hospital in Tanzania

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Abstract

Background: Early detection and effective treatment with antiretroviral drugs would help preserve/improve the immune system, ameliorate quality of life of persons with HIV/AIDS and prevent unintentional spread of the virus. To that end provider initiated HIV counseling and testing (PIHCT) is recommended as standard of care for all patients attending health facilities in HIV endemic countries. This study aimed at determining the prevalence and factors associated with unknown HIV infection among medical admissions at Muhimbili National Hospital (MNH) as an indicator of PIHCT practice in Dares salaam, Tanzania.

Methods: Patients newly hospitalized into MNH medical wards with unknown HIV sero-status were recruited in this hospital based cross sectional study. Patients were interviewed, examined, counseled and tested for HIV. CD4+ T lymphocytes count was determined for HIV positive and patients were followed up to determine in hospital outcome and duration of stay.

Results: Of the 505 patients with unknown HIV status, 30 (5.9%) tested positive for HIV and all of them had visited another health facility before being referred to MNH compared to 78.5% among those who tested negative ($p=0.004$). More than two thirds (66.7%) of the newly diagnosed HIV patients had advanced disease. But, history of chronic diarrhea and/or severe weight loss, severe wasting (Slim disease) common features of AIDS in the 1980s were not apparent despite the late clinical presentation. Patients presenting with fever, oral ulcers, oral candidiasis, altered mental status, generalized lymphadenopathy were more likely to be diagnosed with HIV infection. Age of ≥ 50 years had a negative correlation towards a new diagnosis of HIV infection.

Conclusion: Over 85% of medical patients referred to MNH did not know their HIV status. Newly diagnosed HIV sero-positive patients did not present with AIDS defining illnesses although over two thirds of them had advanced disease and in hospital mortality was high.

Keywords: Provider initiated HIV counseling and Testing among medical admissions, Dar Es salaam

Introduction

Early detection and effective treatment of opportunistic infections and use of antiretroviral drugs help preserve/improve the immune system, ameliorate quality of life of persons with HIV/AIDS and prevent unintentional transmission of HIV infection. In addition awareness of HIV status has been reported to have positive effect on HIV-related risk behaviors [1]. To that end, provider initiated HIV counseling and testing (PIHCT) is recommended as standard of care for all patients attending health facilities, in countries with high HIV rates in the general population [2]. Published studies indicate that 20%-52% of hospital medical ward beds, in sub-Saharan African (SSA) may be occupied by HIV infected patients, with opportunistic infections (OIs) accounting for the majority of these admissions [3].

Tanzania hospital data suggest that HIV infection is highest among patients with infective conditions [4]. Similar findings were reported among Ugandan medical ward patients where HIV prevalence rates were reported to be highest [5].

One of the key strategies of HIV prevention, care, treatment and ultimately control is provision of HIV counseling and testing to the general population and in particular persons receiving care in health facilities. The uptake of routine HIV counseling and testing in most health facilities however, has been reported to be inadequate due to various reasons [6]. Provider initiated HIV testing and counseling (PIHCT) in health care facilities, in countries with generalized epidemic, was first advocated by WHO in 2007 as a strategy to increase the uptake of HIV testing [2]. Subsequently, many SSA countries, including Tanzania, introduced PIHCT as standard of care for people attending health facilities.

By and large reported studies on PIHCT uptake from SSA have focused on outpatient populations [7].

This study aimed at determining the prevalence and factors associated with unknown HIV infection among patients hospitalized in the Medical wards of Muhimbili National Hospital

Methods

Study design and population

We conducted a hospital based cross sectional study in the medical wards of Muhimbili National and Teaching Hospital in Dar es salaam, Tanzania. Patients aged > 14 years and hospitalized for the first time in the MNH medical wards with unknown HIV sero-status were recruited. Patients known to be HIV infected and those who had participated in an HIV vaccine trial conducted in Dar es salaam earlier were excluded. The study was conducted for three months from August to October 2014.

Study Procedure

Consecutive patients admitted in the medical wards during the designated study days (Mondays, Wednesdays and Fridays) were enrolled. All consenting individuals meeting the inclusion criteria were interviewed by using structured questionnaire where personal particulars and clinical symptoms were recorded. The questionnaire and consent forms were applied in Swahili language which they are conversant with. Willing patients were interviewed, examined, counseled and on consenting screened for HIV infection using Determine and confirmed by using Unigold test. A sample was considered sero-negative if non-reactive on Determine and sero-positive if reactive on both assays. CD4+ T lymphocytes count values were determined for HIV positive patients on FACS Count Flow cytometry machine. Pre and post HIV test counseling was provided to all participants. All study participants received appropriate and standard care for their medical conditions. Daily evaluation of patients in the ward was done, from the day of admission to discharge to determine their clinical outcome and duration of hospital stay. The duration of hospital stay was calculated by subtracting the day of admission from the day of discharge or death. Discharge or death on the same day of admission was considered as a single day of in hospital stay. Patients with unknown HIV infection referred to those tested and diagnosed with HIV on that admission, provided the patient had no formal documentation /or no medical records that stated the patient was HIV positive. All study participants signed written informed consent, for study subjects aged < 18 years verbal assent was obtained and consent was requested from the parent/or guardian of the minor.

Data Analysis

Data coding, entry, cleaning and analysis was done by using Statistical Package for Social Sciences (SPSS) version 19.0. Continuous variables were reported as mean ± standard deviation and categorical variables as percentages. Comparison of characteristics between groups was done using t-test for continuous variables and Chi-square or Fisher's exact test for categorical variables. We used univariable and multivariable logistic regression model to examine associations between various characteristics and HIV status. Crude odds ratio (COR), adjusted odds ratio (AOR), 95 % confidence intervals and p-values were determined.

Results

A total of 610 patients were admitted in medical wards during the study period. The actual study population was 583 after discounting 27 of whom 7(1.1%) were discharged before enrolment, 5 (0.8%) died before assessment and 15 (2.4%) declined to take part. From the 583 participants 78 (13.4%) had confirmed HIV disease. The remaining 505/583 (86.6%) patients had unknown HIV sero- status and were enrolled into the study of whom 336 (66.5%) were females. The mean age of the study participants was 44.9 years with a range between 14 and 95 years and 61.6 % were aged below 51 years. Over 40% of the study subjects were unemployed or students with no source of income. Among the 505 study subjects with unknown HIV sero-status 30 (5.9%) were found to be HIV infected. Overall HIV prevalence in medical wards was found to be 18.5%.

HIV infection proportion was 10.4% and 2.1% among subjects in the age group 31-40 compared to those in the age group of 50 years or more respectively, p=0.003. Divorced or widowed study subjects had the highest HIV proportion 5 (8.9%) while those who were married or cohabiting had the lowest 13 (4.4%), but the difference was not statistically significant (Table 1).

HIV prevalence was greatest among subjects with formal employment (10%). The proportion of HIV positive was significantly higher among patients residing in Dar es Salaam (7.2%) compared to those residing in other regions (2.3%). A higher proportion of current alcohol users were HIV infected (10%) compared to 3.7% non-users (p= 0.004.). Individuals with a history of having sexually transmitted diseases (SDIs) had a higher HIV prevalence (17.2%) than those with no history of symptoms (2.3%), p=0.02.

Table 1: HIV infection proportion by Socio- demographic profiles

Variable	HIV Positive n (%) (n=30)	HIV Negative n (%) (n=475)	Total N	P-value
Sex				
Male	11(6.5)	158 (93.5)	169	0.70
Female	19 (5.7)	317 (94.3)	336	
Age groups				
<30	9 (6.3)	134 (93.7)	143	0.001
31 - 40	10 (10.4)	86 (89.6)	96	
41 - 50	7 (9.7)	65 (90.3)	72	
> 50	4 (2.1)	190 (97.9)	194	
Marital status				
Single	12 (7.9)	140 (92.1)	152	0.20
Married/Cohabiting	13 (4.4)	284 (95.6)	297	
Divorced/Widow	5 (8.9)	51 (91.1)	56	
Education level				
No formal	1 (1.5)	67 (98.5)	68	0.28
Primary	18 (7.3)	229 (92.7)	247	
Secondary	7 (5.1)	131 (94.9)	138	
College and higher	4 (7.7)	48 (92.3)	52	
Occupation				

Formal employment	11 (10)	99 (90)	110	0.08
Self employed	11 (5.9)	174 (94.1)	185	
Student/ no employment	8 (3.8)	202 (96.2)	210	
Residence				
Dar es salaam	27 (7.2)	348 (92.8)	375	0.04
Other regions	3 (2.3)	127 (97.7)	130	
Health care visit				
Yes	30 (7.4)	373(92.6)	403	0.02
No	0	102 (100)	102	
Current alcohol use				
Yes	18 (10)	162 (90)	180	0.004
No	12 (3.7)	313 (96.3)	325	
History of STDs				
Yes	5 (17.2)	24 (82.8)	29	0.02
No	25 (5.3)	451 (94.7)	476	

† Fisher's exact test

More than two thirds (66.7%) of HIV infected individuals had advanced HIV disease based on the WHO HIV clinical staging. The most frequently reported symptoms in newly diagnosed HIV positive patients were fever 19 (63%), malaise 18 (60%), night sweats 12 (40%), weight loss 11 (36.7%), difficulty in breathing 10 (33.3%) and altered mental status 10 (33.3%). Other frequently reported symptoms included oral ulcers 7(23.3%), and skin lesions 7 (23.3%). (Table 2) Generalized lymphadenopathy 9 (30%), oral thrush 8 (26.7%), mucous membrane pallor 8(26.7%), and nail changes 7 (23.3%) were the most frequently detected abnormal physical signs among HIV infected patients. Tuberculosis was diagnosed in 16.7% of patients with HIV infection.

Table 2: Presenting Symptoms among Study Subjects in Relation to HIV Status

Symptoms	HIV Positive n (%) (n=30)	HIV Negative n (%) (n=475)	P-Value
Fever	19 (63.3)	90 (18.9)	< 0.001
Cough	4 (13.3)	94 (19.8)	0.386
Weight loss	11(36.7)	101 (21.3)	0.049
Night sweats	12 (40.0)	60 (12.6)	< 0.001
Diarrhea	2 (6.7)	10 (2.1)	0.112
Oral Ulcers	7 (23.3)	7 (1.5)	< 0.001
Altered mental status	10 (33.0)	62 (13.1)	0.025
Palpitations	6 (20.0)	129 (27.2)	0.390
DIB	10 (33.3)	165 (34.7)	0.876
Malaise	18 (60.0)	176 (37.1)	0.012
Skin disease	7 (23.3)	40 (8.4)	0.006
Others	3 (10.0)	65 (13.7)	0.784

Others; Seizures, abdominal pain

The median CD4+ T lymphocytes count was 247cells/mm³; and 46.7% had CD4 T lymphocytes count less than 200 cells/mm³. During the hospitalization course, the inpatient mortality rate was

26.7% among HIV positive compared 13.3%among HIV negative (p= 0.041). The mean duration of hospital stay was 6.9 (SD 3.7) days among HIV positive patients compared to 5.9 days (SD 4.8) among HIV negative (p =0.264).

Univariate and multivariable odds ratios for HIV positive in relation to various factors is shown in Table 3. Patients presenting with fever or malaise had about a three fold increased odds to be HIV infected compared to those who did not present with similar symptoms. Patients presenting with oral candidiasis (AOR=44), altered mental status (AOR=14), generalized lymphadenopathy (AOR=10) were more likely to be diagnosed with HIV infection. Age of ≥ 50 years had a negative correlation towards a new diagnosis of HIV infection.

Table 3: Logistic regression analysis of factors associated with HIV sero - positivity

Bivariate			Multivariate	
Characteristic	OR(95%CI)	P	AOR(95%CI)	P
Age >50	0.3(0.1-0.7)	0.009	0.1(0.0-0.5)	0.004
Alcohol use	2.9(1.4 - 6.2)	0.006	2.0(0.7- 6)	0.221
STIs	3.8(1.3-10.7)	0.013	1.2(0.2-7.5)	0.827
Symptoms				
Fever	7.4(3.4-16.1)	0.000	3.6(1.1-12)	0.034
Weight loss	2.1(1.0 - 4.7)	0.010	2.1(0.9- 4.7)	0.054
Night sweats	4.6(2.1-10.1)	0.000	1.7(0.5 -6.1)	0.403
Diarrhea	3.3(0.7-16)	0.133	-	
Oral ulcers	28.6(8.4- 97)	0.000	19(2.0 -183)	0.010
Confusion	3.6(1.4- 9.4)	0.010	0.4 (0.1- 3.1)	0.402
Malaise	2.5(1.2 - 5.4)	0.015	2.7 (0.9-8.2)	0.079
Skin lesions	3.3(1.3-8.2)	0.010	3.4(0.6 - 19)	0.157
Signs				
Hair changes	5.6(1.1-29)	0.040	0.8 (0.0-59)	0.906
Oral candida	86(17 - 429)	0.000	44.5(3- 668)	0.006
LN	28.6(9.7-84)	0.000	10.2(2.1-43)	0.002
AMS	4.7(1.8-12)	0.002	14.2(2.4-95)	0.006

AMS - altered mental status, LN- lymphadenopathy

Discussion

In 2007 the WHO published guidelines on provider initiated HIV testing and counseling (PIHCT) to increase HIV testing rates particularly among persons attending health care facilities in countries with generalized epidemic. In the same year, Tanzania adopted these recommendations and made PIHCT standard of care in all healthcare facilities. Health care providers; are directed to recommend HIV testing and counseling to patients as part of standard care even if they do not have obvious HIV-related symptoms or signs. Such patients may nevertheless be HIV infected and may benefit from knowing their HIV-positive status in order to receive appropriate health care services.

The overall HIV prevalence amongst the medical admissions was 18.5%, which is higher than the prevalence of 6.9% found among the adult population of Dar es salaam in 2011/12 [8]. The HIV prevalence of 18.5% however is lower than 35% reported from the

same wards in the early 1990s [9]. The HIV prevalence among the general population in Dar es salaam in the 1990s was above 10% compared to 6.1% in 2011/2012. The HIV prevalence among hospital admissions is to a large extent a reflection of the prevalence in the general population where it has declined from its peak during the 1990s. In addition, wide scale provision of ART for people with HIV/AIDS partly contributed to the observed reduced proportion of HIV related admissions in comparison to the situation in the early 1990s. Nonetheless, the burden of HIV/AIDS in the medical wards at MNH remains high in spite of provision of ART at no financial cost to patients. The observed reduction in HIV prevalence among medical admissions correlates well with findings from recent studies done in other parts of Africa [10,11].

The majority (80%) of the HIV infected had advanced HIV disease at the time of diagnosis. Given that, HIV testing ought to be a routine procedure in all hospital facilities in Tanzania the 505 who did not know their HIV status in spite of having been attended other health care facilities before referral to MNH, represent missed opportunities for early HIV testing at the referring health care facilities. It is quite likely that, patients with AIDS defining illnesses were tested for HIV at peripheral health facilities which may explain the observed prevalence of 5.9% being lower than expected. Nonetheless, these results underscores the point that HIV disease may present for the first time with severe immune-suppression without the “classical” symptoms of severe weight loss (slim disease), chronic diarrhea and/or Kaposi’s sarcoma likely to prompt most health care providers to initiate discussion and provide an opportunity for HIV testing.

When they were approached 505/520 (97.1%) patients consented to HIV testing, suggesting that failure to the implementation of PIHCT policy was not due to patient refusal. And therefore reasons behind partial operationalization of the PIHCT policy are likely to be centered on the health care providers and/or health care facilities rather than patients. The results of this study indicate that a significant number of health facility attendees in Dar es salaam are not being tested for HIV as per PIHCT policy directives. High acceptance rate for HIV counseling and testing has also been reported among inpatients in Uganda and among TB patients in Ethiopia, Kenya and Democratic Republic of Congo [5, 12-16]. On the other hand uptake of PIHCT among women attending STD clinic in South Africa was reported to be less than 50% [17]. Available evidence shows that the uptake of PIHCT is variable depending on the population under study. Consequently, there is urgent need to conduct studies to determine the impediments to fully implementation of the PIHCT policy at the health facilities in Dar es salaam including MNH.

Data from studies done in the 1990s reported severe wasting (slim disease), severe weakness prolonged fevers and chronic diarrhea as the most characteristic features of HIV/AIDS [18, 19]. In contrast; results from this study show that fever, oral candidiasis, generalized lymphadenopathy and altered mental status were the commonest clinical features found among those hospitalized with unknown HIV infection. Reasons behind the absence of the “principal “clinical features for HIV/AIDS among patients seen in this study are not clear, but are likely to be multi-factorial. First; it may just be a selection bias due to a low HIV testing threshold for patients with the severe weight loss, chronic diarrhea etc in peripheral hospitals and hence such patients were not referred to MNH or they were correctly put in the group with known HIV infection. Secondly; AIDS patients presenting with typical features of other recognized

diseases and with relatively few indicators of immunodeficiency have been reported in Africa before [20]. Lastly; the clinical features may be a reflection of changing properties of the HIV virus over the duration of the epidemic. In a meta-analysis of HIV -1 virulence in association with disease progression, it was found that the HIV-1 virulence over the course of the epidemic had changed; a factor that could impact on the clinical manifestations [21, 22]. However, studies with much larger number of HIV/AIDS patients are required to confirm these findings. There was no significant difference in the mean duration of hospital stay between HIV sero-positive and sero-negative patients. Although, we expected HIV/AIDS patients to have longer hospital stay than HIV-negative patients this was not the case probably because of the higher in hospital mortality rate among HIV positive patients compared to HIV negative (p=0.041). In contrast data from several government hospitals in Zimbabwe showed that HIV/AIDS patients had significantly longer hospital stay than non-HIV infected patients [23].

The in hospital mortality was highest (64.3%) among patients with CD4+ T lymphocytes counts of less than 200 cells/mm³. High in hospital mortality rates among patients with HIV/AIDS have also been reported in several studies in SSA [24 - 26].

Muhimbili National Hospital where the study was done receives selected patient population not representative of the general patient population in Dar es salaam health facilities and hence our results may not be representative of Dar es salaam hospitals. In spite of this limitation, our data points out the fact that; opportunities for HIV testing and counseling are at best suboptimal in Dar es salaam hospitals.

Conclusion

Over 85% of patients from the MNH medical wards enrolled into this study did not know their HIV sero-status. Newly diagnosed HIV positive patients did not have classical AIDS defining illnesses although over two thirds of them had advanced HIV disease at the time of diagnosis. The mortality rate in this group was also high.

Declaration

Ethical approval was granted by the Muhimbili University of Health and Allied Sciences (MUHAS) Institutional Review Board (IRB) and permission to conduct the study was obtained from the Muhimbili National Hospital (MNH) administration.

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