Original Research Article

Seroprevalence of Syphilis among Human Immunodeficiency Virus Positive Individuals Attending Immune Suppressed Syndrome Clinic at International Hospital, Kampala Uganda

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Abstract

Background: Syphilis continues to be a persistent public health challenge and gaining renewed attention against the back drop of HIV pandemic especially in the less developed high HIV stricken countries like Uganda. This study enrolled 150 HIV infected individuals. The objective was to determine the syphilis sero-prevalence and factors associated with syphilis infection among HIV positive individuals attending immune suppressed syndrome (ISS) clinic at International Hospital Kampala -Touch Namuwongo Project (TNP).

Methods/Design: This was a cross sectional study that recruited participants between January and May, 2014. Rapid plasma reagin test (RPR; BD Diagnostics) was used to screen for syphilis and if positive was confirmed by the *Treponema pallidum* haemagglutination assay (TPHA; Biotec Laboratories Limited Ipswich Suffolk, UK).

Results: We found 10% (*n*=15) seroprevalence of syphilis in the HIV positive individuals. Further; gender, age, occupation, marital status, polygamous relationship and education level attained did not show statistically significance association with syphilis infection ($p>0.05$). This prevalence was slightly higher in males (10.9%) than females (9.6%). The age groups 15-30 and 31-63 years had the highest (73%) and lowest (27%) seroprevalence of syphilis respectively.

Conclusion: Syphilis appears to be common amongst HIV infected individuals studied. We recommend an urgent need to sensitize, screen and treat reproductively and sexually critical age group.

Key words: *Treponema pallidum* Hemagglutination Assay, Human Immunodeficiency Virus, Rapid plasma reagin, Immune Suppressed Syndrome, Prevalence, Syphilis

1. Introduction

Syphilis is a sexually transmitted infection (STI) caused by a spirochete bacterium *Treponema pallidum*. It is a multistage disease characterized by localized, disseminated and chronic forms of infection. An estimated 12 million people globally have been infected; of which, almost two-thirds are in sub-Saharan Africa and south/southeast Asia [1]. In Uganda a report in 2009, human immunodeficiency virus (HIV) and active syphilis prevalences were 28.8% and 4.3 %, respectively, and a high risk sexual behaviour was frequently reported [2]. Some 35 million individuals globally are infected with HIV (0.8 % prevalence) [3]. Sub-Saharan Africa remains at the epicenter of global HIV with prevalence of 25 million infected individuals, and some 3.2 million children under age 15 are infected with HIV; Adult prevalence (15–49) age group is 4.7% [3].

Because of a common their transmission route as well as the fact that they are mainly blood borne infections, syphilis and HIV co-infection continues to be a public health problem especially in the low income settings. More specifically, syphilis causes genital ulcer and facilitates HIV entry and shading. Besides, it induces immune activation and favor viral replication, which in turn accelerate HIV transmissibility [4, 5]. Syphilis has been a subject of intrigue and controversy since it was first recognized in the 15th century coined "the great imitator", it can manifest in a variety of ways depending on the host and stage of infection thus making diagnosis and management difficult [6].

In sub-Saharan Africa like Ethiopia, a combination of social stigma and associated underreporting, their asymptomatic nature, and lack of diagnostic facilities make the health and socioeconomic impacts of sexually transmitted infections unknown [7], this is no different in contexts like Uganda. The incidence of syphilis is rising all over the world, partly due to the increased transmission in HIV patients and other high risk groups such as men who have sex with men [7], the Ugandan scenario is predominantly due to the former.

This study was aimed at determining the seroprevalence and risk factors of syphilis among HIV–positive individuals attending ISS clinic at International Hospital Kampala, Namuwongo Touch Project so that to provide baseline data on the prevalence of syphilis in this population and guide their routine care and management.

2. Materials and methods

This was a cross-sectional study conducted at International Hospital Kampala (IHK), Touch Namuwongo Project (TNP), IHK is a private healthcare facility owned by the International Medical Group, the largest private healthcare group in Uganda and a teaching hospital for International Health Sciences University (IHSU), Kampala. Recruitment took place between January and May, 2014. The hospital is located in Namuwongo in Makindye Division, in southeast Kampala. Touch Namuwongo Project is a HIV/AIDS

prevention and treatment project based at International Hospital Kampala serving both urban and peri-urban HIV positive individuals.

The study population comprised all HIV–positive confirmed individuals attending the TNP. Being an exploratory study, our sample size was calculated to be 150 assuming syphilis prevalence of 11% amongst HIV positive individuals slightly higher than 9.8% syphilis prevalence in HIV–infected patients in Ethiopia [8], for our sample size estimation, we chose syphilis prevalence of 11% among HIV infected individuals because Uganda has more than three times HIV prevalence (7.4%) compared to Ethiopia (2.4%); we further assumed 95% level of confidence.

Individuals excluded from the study were children < 15 years of age, as they were fewer in number at the clinic as well as individuals already receiving syphilis treatment.

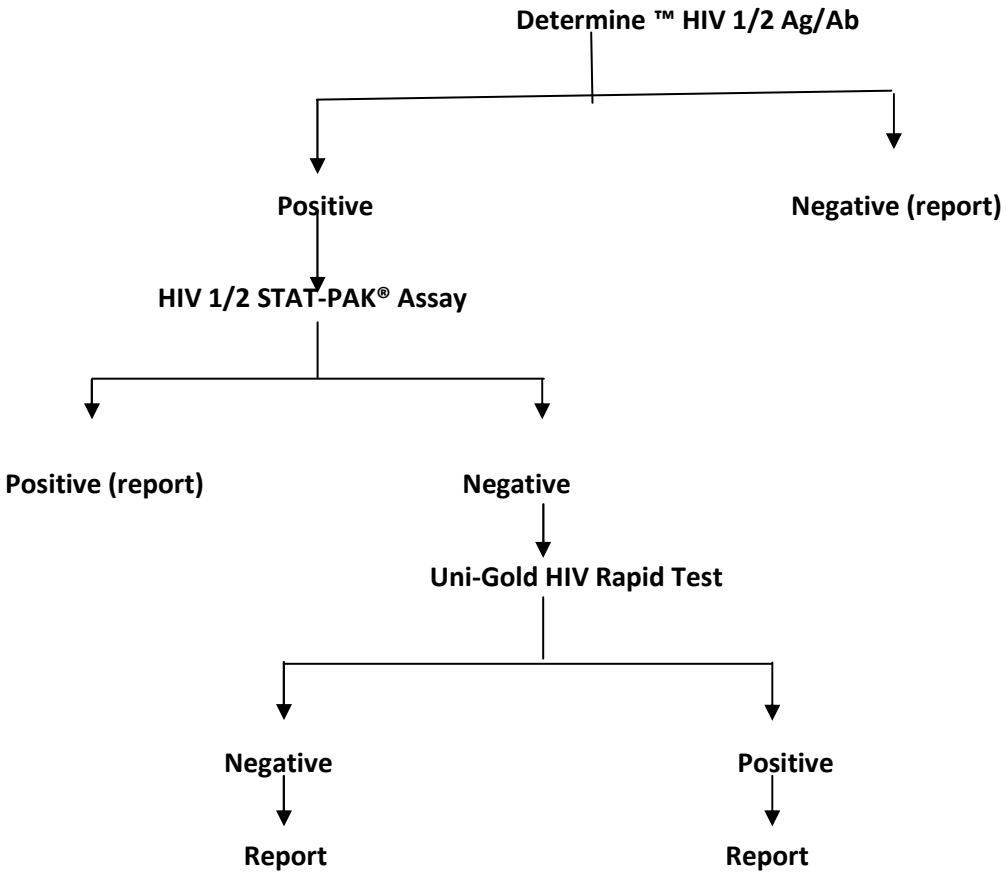
Sample testing was carried out according to the directions of the manufacturers and all tests were run against known positive and negative controls for quality assurance. Only those samples positive by both RPR and TPHA were considered to have syphilis [9]. A well trained certified counselor interviewed the study participants using structured questionnaires on offering written informed consent and other risk factors such as; gender, age, multiple sexual partner (more than one sexual partner), current condom use, marital status, education level, occupation, religion, excessive alcohol or drug use during sexual activity, and history of STIs were also collected.

Data was analyzed using SPSS Version–16, and results were summarized using descriptive statistics. Bivariate cross-tabulations was performed on selected risk factors to find those significantly associated with syphilis. A p-value < 0.05 was considered to be statistically significant. The study was approved by both Ethics Committee of the International Health Sciences University and International Hospital Kampala.

3. HIV testing Algorithm

HIV diagnostic tests function either by detecting host antibodies made against different HIV proteins or by directly detecting the whole virus itself or components of the virus such as the HIV p24 antigen or HIV RNA.

Figure 1. Algorithm for HIV screening and confirmatory test in Uganda



When screening for HIV, Unigold is used as a tie breaker between Determine® and Stat-Pak® since it is highly specific for the HIV specific antibodies. Inconclusive laboratory HIV results are always referred for Enzyme Linked Immunosorbent Assay (ELISA) and Polymerase Chain Reaction (PCR) at the reference

laboratory at Medical Research Council (MRC)/Uganda Virus Research Institute (UVRI) Uganda Research Unit on AIDS, Entebbe, Uganda.

4.0 Results

A total of 150 HIV patients who attended TNP-ISS clinic at International hospital Kampala were enrolled in the study. Table 1, our study found 15 individuals positive for syphilis amongst the HIV infected positive participants, 33% were males and 67% were females (Figure 3). We further found 73% of those who tested positive for syphilis were 15-30 years age group and 27% were above 30 years. None of the selected risk factors was associated with syphilis infections, statistical significance at $p < 0.05$.

Table 1. Social demographic factors

Variable	Frequency(*n*=150)	Percentage (%)
Sex		
Female	104	69.33
Male	46	30.67

Occupation		
Business	30	20.00
Driver	10	6.67
House wife	21	14.00
Teacher	11	7.33
Maid	5	3.33
No job	11	7.33
Others	62	41.33
Marital status		
Married	92	61.33
Divorced	21	14.00
Single	37	24.67
Nature of Marriage		
Monogamy	73	48.66
Polygamy	40	26.67
None	37	24.67

Education level		
Secondary	41	27.33
University/tertiary	87	58.00
Primary	18	12.00
None	4	2.67

Out of 150 study participants, 30.7% and 69.3% were male and females respectively. Further, Table 1. Shows the distribution of the different social demographic factors of the participants. More than half were married (61.33%), 48.66 % in monogamous relationships, and more than half (58.0%) had university/tertiary education level.

Table 2. Laboratory Syphilis confirmatory results

Results	**Frequency(n=150)**	**Percentage (%)**
Negative	135	90.00
Positive	15	10.00

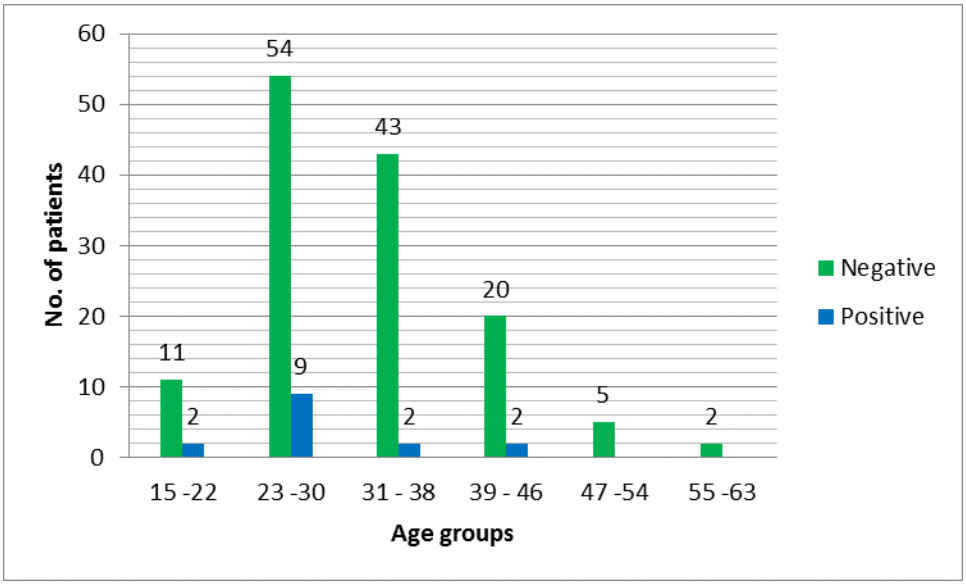
We recruited a total of 150 HIV infected individuals and confirmed 15 (10%) syphilis seropositive cases (co-infected).

Table 3. Shows bivariate analysis between sero-prevalence of syphilis and selected risk factors

Variable	Chi value	*P* value
Gender	0.0557	0.813
Occupation	8.7132	0.727
Marital status	0.5805	0.748
Nature of marriage	3.4523	0.178
Education level	5.4106	0.248

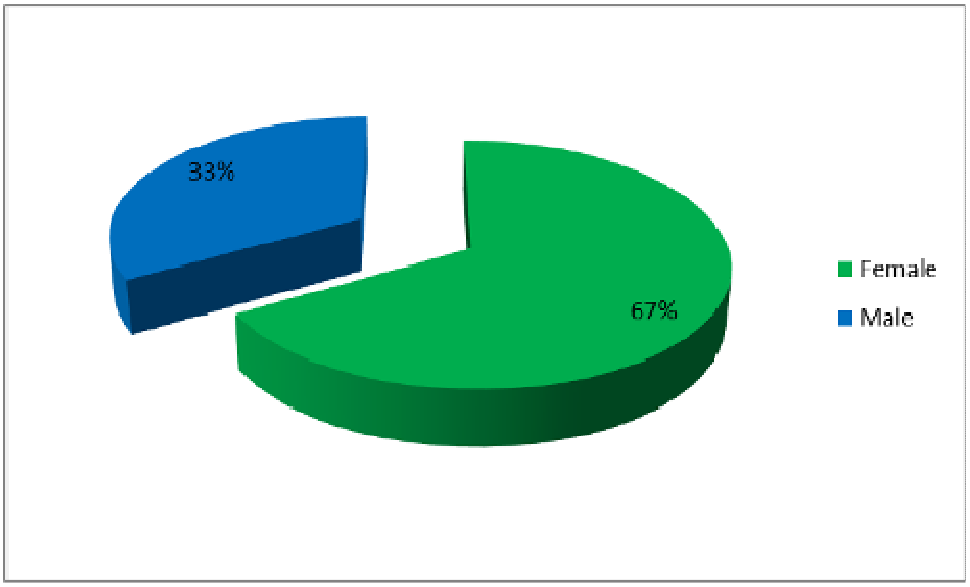
We did not find significant statistical association between syphilis infection and gender, occupation, marital status, and level of education ($p>0.05$), Table 3.

Figure 2. A graph showing the age distribution of syphilis among the HIV patients attending ISS clinic international hospital Kampala (Touch Namuwongo Project)



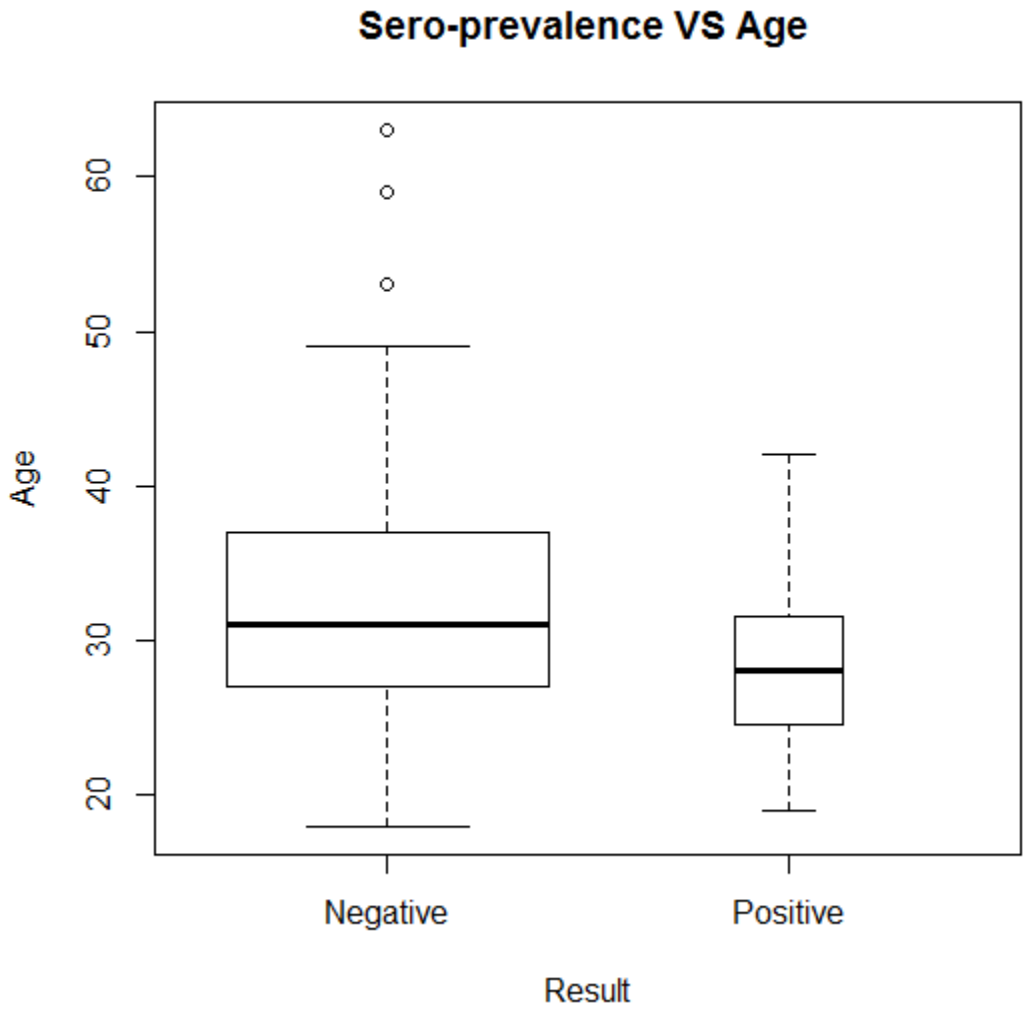
Our study participants were between 15 to 63 years. About seventy three percent of the syphilis seropositive patients were below the age of 30 years.

Figure 3. A pie-chart showing the gender distribution co-infected individuals



Fifteen patients tested positive for syphilis amongst the HIV infected individuals (coinfected), 33% were males and 67% were females, twice the number of males (Figure 3).

Figure 4. A box plot showing the prevalence of syphilis among HIV patients by age



More than 50% of the HIV/Syphilis duo infected individuals were below the age of 30 years well as more than 50% of syphilis sero-negative HIV infected individuals were above 30 years of age (Figure 4).

Discussion

Syphilis remains an important STI in the era of HIV infection. Individuals infected with HIV are vulnerable to many STIs amongst other opportunistic infections. Therefore identification of syphilis cases in this population should be a priority addressed by HIV/AIDS control programs especially in low income settings where HIV continues to be on the rise. Our study determined syphilis prevalence to be 10% amongst HIV –positive individuals (co-infection) at TNP-IHK. Further, none of the selected risk factors was found to be statistically significantly associated with syphilis infections. In a systematic review of literatures from several regions of the world, a median point-prevalence of syphilis among HIV–infected patients was shown to be 9.5% [10], therefore our prevalence is slightly higher than the global median.

From our study, n=150; there were more female (104) than male (46) participants; this would partially be due to that fact that TNP being an HIV clinic, more pregnant mothers were more likely to seek counseling so as to prevent mother to child transmission (PMTCT) of HIV infection therefore this could have led to a high number of female participants. The low number of male participants could be possibly explained by men's inherent behaviors and reluctance to seek medical care, this is further complicated by the fact that in many African societies men are the bread winners of the families.

The 15 who were positive for HIV and syphilis (co-infections) giving a prevalence of 10%. This is in agreement with the recent findings of Shimelis *et al* (2013) done in the Hospital of Ethiopia which gave a seroprevalence of 9.8% [8] probably this may be due to the fact that the two countries have different HIV prevalence levels 2.4% in Ethiopia as compared to Uganda 7.4% [11], three times higher than latter. However, this study disagrees with a previous one carried Asiki *et al* (2011) among fishing communities of Lake Victoria in Uganda which reported a prevalence of 4.3% [2]. This may be partially explained by the fact that fishing communities are characterized by complex socio-demographics.

The high prevalence of the co-infections in this study could have been due to the high sexual activity with 60% of the participants between 23-30 years age group. Polygamous marriages accounted for 46.7% of the co-infected participants. The co-infection prevalence was greater in male (10.9%) than in females (9.6%). This is in agreement with the findings of Shimelis *et al* (2013) where the prevalence in males was 11% and females 8.9% in Ethiopia. However, we found no association between gender and co-infections (P=0.813). The slightly high prevalence in males could have been due to polygamous relationships and lack of awareness of syphilis, since 80% of the males positive for syphilis in this study were in polygamous marriages.

Among other risk factors; none of these factors was statistically significant. Marital status (P=0.748), Nature of marriage (P=0.178), Education level (P=0.248), Occupation (P=0.727). The non-significance of these factors could have been possibly due to fairly small sample size and the patients failing to admit some factors like commercial sex workers and having had unprotected sex which were deemed to have been the main exposing factors to syphilis as stated by the world health organization in 2011.

Despite the fact that age was not significantly associated with syphilis (P=0.543), the prevalence was highest in the age group (15-30) at 73 % and lowest in the age group (> 30). This is in agreement with a study by Sarah in United States (2011) [12]. This could have been due to high sexual activity and ignorance about syphilis in the youths where the prevalence was found to be high.

Conclusion

This draws an imperative need to sensitize adolescents about the risk of Syphilis infections and transmission since this age group coincidences with the onset of sexual activity and reproduction. The UNAIDS (2014) indicated that Uganda has an HIV infection prevalence of 8.0% among 15-49 years age group. This duo infection has a potential for vertical transmission therefore care and management of

HIV positive individuals should involve routine syphilis screening with emphasis on pregnant mothers. Sensitization efforts should be carried out by HIV/AIDS control programs among the youths to ensure that they understand the risk factors of the co-infections and proper treatment of all individuals testing positive for syphilis. The counselors and other health care workers in the different HIV clinics need to be knowledgeable regarding syphilis symptoms, this can be part of continued medical education at different levels to increase case detection of syphilis amongst this vulnerable population.

Competing interests

Authors declare no competing interests

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