The Risk Factors Associated with HIV Infection among Attendees at Edelweiss Clinic, Dr. Sardjito Hospital, Yogyakarta

Nurul Nadiah Binti Muhamad Shaidi[1], Yanri Wijawanti Subroto[2*], Sumardi[2]

[1]Undergraduate Student, Faculty of Medicine, Universitas Gadjah Mada, Yogyakarta, Indonesia; [2]Department of Internal Medicine, Faculty of Medicine, Universitas Gadjah Mada/ Dr. Sardjito Hospital, Yogyakarta, Indonesia.

Corresponding author: ysubronto@yahoo.com

ABSTRACT

Introduction: The majority of human immunodeficiency virus (HIV) infections in Indonesia are transmitted by using contaminated injecting equipment, unprotected paid sex, and unsafe sex between men. The spread of HIV is further exacerbated by several factors, including a widespread commercial sex industry, high prevalence rates of sexually transmitted infections (STIs) and its insufficient clinical services, as well as the very low rate of condom use. However, data regarding the risk factors of HIV infection in Yogyakarta is limited.

Objectives: The aim of this study was to identify the risk factors of HIV infection among attendees tested for HIV at Edelweiss Clinic, Dr. Sardjito Hospital, Yogyakarta in 2008.

Methods: This study was a cross-sectional study involving 58 participants who divided into HIV-positive and HIV-negative groups. Demographic and risk factor data were collected from medical records. Data were analyzed using Chi-square test.

Results: Among HIV-positive patients, 65.4% were sexually active and 19.2% were drug users. Although it was not statistically significant, sexually active might be associated with HIV infection. Among sexually active HIV-positive individuals, 41.2% had multiple partners. However, its association with the disease was weak (r = 0.115). Injecting drug users (IDUs) had higher risk getting HIV infection (r = 0.115) compare to sexually active individuals (r = 0.000). Anal sex (r = 0.038) had a weak association with HIV-positive status.

Conclusion: Sexually active was a risk factor of HIV infection among attendees tested for HIV at Edelweiss Clinic. The chance of virus transmission was higher among the IDUs.

Keywords: HIV, risk factor, sexually active, injecting drug users

INTISARI

Pendahuluan: Sebagian besar infeksi *human immunodeficiency virus* (HIV) di Indonesia ditularkan melalui penggunaan alat injeksi yang terkontaminasi, serta praktek prostitusi dan hubungan seks sesama pria yang tidak aman. Penyebaran HIV menjadi lebih cepat karena beberapa faktor, antara lain maraknya industri seks, tingginya angka infeksi menular seksual (IMS), penanganan klinik IMS yang kurang baik, serta rendahnya penggunaan kondom. Namun demikian, informasi terkait faktor risiko infeksi HIV di Yogyakarta masih terbatas.

Tujuan: Penelitian ini bertujuan untuk mengetahui faktor risiko infeksi HIV pada individu-individu yang datang ke Klinik Edelweiss, Rumah Sakit Dr. Sardjito untuk tes HIV pada tahun 2008.
Metode: Penelitian ini adalah penelitian *cross-sectional* yang melibatkan 58 subyek yang dibagi menjadi dua kelompok, yaitu kelompok HIV positif dan negatif. Data demografik dan faktor risiko diperoleh dari rekam medik. Data dianalisis menggunakan tes Chi-square.
Hasil: Di antara pasien HIV positif, 65.4% aktif secara seksual dan 19.2% merupakan pengguna narkoba. Meskipun tidak bermakna secara statistik, status aktif seksual mungkin berkaitan dengan kejadian infeksi HIV. Di antara subyek positif HIV yang aktif secara seksual, 41.2% mempunyai pasangan seksual lebih dari satu. Namun demikian, kaitannya dengan infeksi HIV lemah (r = 0.115). Pengguna narkoba suntik mempunyai risiko terinfeksi HIV lebih tinggi (r = 0.115) dibandingkan dengan individu yang aktif secara seksual (r = 0.000). Anal seks (r = 0.038) mempunyai kaitan lemah dengan infeksi HIV.
Simpulan: Aktif secara seksual merupakan faktor risiko infeksi HIV di antara individu yang datang ke Klinik Edelweiss untuk tes HIV. Peluang transmisi virus lebih tinggi pada pengguna narkoba suntik.

Kata kunci: HIV, faktor risiko, aktif secara seksual, pengguna narkoba suntik

INTRODUCTION

The HIV epidemic in Indonesia is among the fastest growing in Asia although the aggregate HIV prevalence among adults (15-49 years of age) is still low (0.16%). In 2006, an estimated 193.000 people were living with HIV in Indonesia. The epidemic remains concentrated, in most parts of the country, among groups at high risk: populations sharing injecting equipment and engaging in unprotected sex[1].

Since the first AIDS case was reported in 1987 in Bali, HIV has affected all of Indonesia. Currently, 32 provinces and 169 districts out of a total of 33 provinces and 440 districts respectively have reported AIDS cases. Injecting drug use accounts 50% of AIDS cases reported out of a cumulative number of 8194 AIDS cases reported up to December 2006[2].

Transmission remains largely through the sharing of contaminated injecting equipment among drug users. Injecting drug use appears to be a growing phenomenon in urban Indonesia and is also increasingly recorded in non-urban areas[3].

HIV prevalence among injecting drug users has been recorded as very high in Jakarta, West Java, East Java and Bali. This sub-population is thought to be the most severely affected by the HIV epidemic in Indonesia. Significant increases in transmission via unprotected sex are also being recorded, signifying a shift towards sexual transmission in the epidemics[3].

Besides the persistent challenges of injecting drug use and unprotected sex, the spread of HIV in the country is further exacerbated by several factors, including a widespread commercial sex industry, high prevalence rates of STIs and insufficient STI clinical services, as well as very low levels of condom use[3].

Ministry of Health and National AIDS Commission Republic of Indonesia estimated that 4 to 8 million people in Indonesia are at high risk of contracting HIV. The most of them belong to two sub-populations, clients of sex workers (3.1 million), and the partners of clients of sex workers (1.8 million). Among the estimated number of people living with HIV (PLHIV) in Indonesia, 46% are injecting drug users (IDUs) and 14% are subjects of sex workers.

Vulnerability is further complicated among IDUs. They commonly also buy and sell sex[3].

Since the year 2000, the HIV epidemic in Indonesia has been concentrated in 4 particularly vulnerable sub-populations (with prevalence >5%): injecting drug users (IDUs) and sex workers (including female and male sex workers), men who have sex with men (MSM) selling sex, and transsexual persons selling sex. The HIV prevalence is consistently at above 5% in a number of high-risk sub-populations since 2000. In 2006, data from various sentinel sites indicated that HIV prevalence was in the range of 21% - 52% among IDUs, 1%-22% among female sex workers (FSWs), and 3%-17% among transsexual persons. Integrated Biological-Behavioral Surveillance (IBBS) among Most at Risk Populations (MARPs) showed prevalence of HIV 20.3% among male sex workers (MSWs), 7.1% among FSW (or 9.5% among all sex workers); 5.2% among MSM; and 52.2% among male IDUs, 56.1% among female IDUs (or 52.4% among all IDUs)[3].

The Ministry of Health also reported that the new AIDS cases rose over the last three years. The number of new AIDS cases in 2006 was 2.873, more than double the number of cases reported in the first 17 years of the epidemic. Of these new cases, 82% occurred in males and 74% in people under the age of 30. The number of regions reporting AIDS case also increased. At the end of 2000, there were only 16 provinces reporting AIDS cases. However, by the end of 2003, cases were reported in 25 provinces. This number increased sharply in 2006, with 32 of the 33 provinces in Indonesia reporting cases of AIDS[3].

The data regarding the risk factors of HIV infection in Yogyakarta is limited. It is important to gather further information on it, in order to control the spread of HIV properly in Yogyakarta.

The objective of this study was to identify the risk factors of HIV infection among attendees tested for HIV in Edelweiss Clinic, Dr. Sardjito Hospital, Yogyakarta, in May to December, 2008.

MATERIALS AND METHODS

This study was a cross-sectional study conducted from May to December 2008. A total of 58 attendees tested for HIV in Edelweiss Clinic of Dr. Sardjito Hospital, Yogyakarta, were enrolled in this study. The attendees were divided into HIV-positive and HIV-negative groups. The demographic and risk factors of HIV infection data were collected from medical record. The risk factors evaluated in this study were sexually active status, having multiple sex partners, using the injection-drug, working as commercial sex workers, and being partners of infected individuals.

Statistical analysis was performed using Chi-square test. The probability was estimated using Pearson Chi-square and Fisher's exact test. Values of $p < 0.05$ were considered statistically significant. If the p-value did not show any correlation, lambda value was used to determine the strength of the correlation between two variables. Lambda is an asymmetric measure of association. Thus, the measure of association differs depending on which variables are considered the independent variable (or dependent variable).

RESULTS AND DISCUSSION

Table 1 shows the characteristic of attendees in two groups, including sex, age, marital status, religion, education, and occupation. Among those variables, only marital status was significantly different between two groups.

Table 1. The characteristic of attendees in HIV-positive and HIV-negative groups

Characteristics	HIV-positive (n = 26)	HIV-negative (n = 32)	p-value
Sex, n (%)			
Male	13 (50)	17 (53.1)	0.813
Female	13 (50)	15 (46.9)	
Age, n (%)			
15 – 24	5 (19.2)	11 (34.4)	0.199
25 – 34	9 (34.6)	15 (46.9)	0.346
35 – 44	10 (38.5)	4 (12.5)	0.022
>45	2 (7.7)	2 (6.2)	1.000
Marital status, n (%)			
Married	19 (73.1)	12 (37.7)	**0.007**
Unmarried	7 (26 .9)	20 (62.3)	
Religion, n (%)			
Islam	20 (76.9)	24 (75.0)	0.865
Hindu	0 (0.0)	0 (0.0)	1.000
Catholic	3 (11.5)	3 (9.4)	0.648
Protestant	2 (7.7)	5 (15.6)	0.442
No religion	1 (3.9)	0 (0.00)	0.448
Education, n (%)			
Never went to school	1 (3.9)	1 (3.1)	1.000
Elementary school	5 (19.2)	3 (9.4)	0.446
Junior high school/equal	4 (15.4)	4 (12.5)	1.000
Senior high school/equal	9 (34.6)	9 (28.1)	0.595
Academy/University	7 (26.9)	15 (46.9)	0.119
Occupation, n (%)			
University student	3 (11.6)	10 (31.2)	0.073
Entrepreneur	5 (19.2)	7 (22.0)	0.805
Private employees	1 (3.8)	6 (18.8)	0.116
Laborer	4 (15.4)	1 (3.1)	0.163
Housewife	6 (23.1)	2 (6.2)	0.123
Not working	4 (15.4)	5 (15.6)	1.000
Pensioned	2 (7.7)	1 (3.1)	0.582
Goverment official	1 (3.8)	0 (0.0)	0.448

Data were analyzed by Chi-square test; P < 0.05 was considered significant; Significant value is indicated in bold.

The possible risk factors for HIV infection are summarized in Table 2. None of those risk factors were associated with HIV infection. However, based on the lambda value, some of them showed a weak positive correlation. Having multiple partners (r = 0.115) and using injecting drug (r = 0.115) might increase the risk of HIV infection. A specific sexual behavior among sexually active subjects, i.e. anal sex, shows weak correlation (r = 0.038). Anal sex was a predisposing factor in HIV transmission.

In this study, working as a sexual worker was not the risk factor of HIV infection. On the contrary, previous studies conducted in Indonesia showed that four to eight million people were at high risk of contracting HIV. The most of them belonged to two sub-populations, subjects of sex workers (3.1 million), and the

Table 2. Risk factors associated with HIV infection

Variable	HIV-positive (n = 26)[a]	HIV-negative (n = 32)[a]	p-value	R
Sex worker, n (%)	1(3.8)	2(6.2)	1.000	0.000
Partner with HIV, n (%)	3(11.5)	4(12.5)	1.000	0.000
Multiple partners, n (%)	7(26.9)	4(12.5)	0.163	**0.115**
Sexually active, n (%)	17(65.4)	17(53.1)	0.346	0.000
Drug user, n (%)	5(19.2)	2(6.2)	0.225	**0.115**
Sexual behavior, n (%)[b]				
Vaginal sex	7(12.1)	11(19.0)	0.542	0.000
Oral sex	0(0.0)	1(1.7)	1.000	0.000
Anal sex	1(1.7)	0(0.0)	0.448	**0.038**

Data were analyzed by Chi-square test; P < 0.005 was considered significant;
[a] One person might have one or more risk factors, and some patients did not want to give information; [b] The data were collected from sexually active individuals only.

partners of subjects of sex workers (1.8 million)[2].

Sex workers and their subjects as core groups of high frequency transmitters play a dominant role in the HIV transmission and other sexually transmitted diseases (STDs). However, a study in Surabaya did not identify any sex workers with HIV infection[4]. Several factors heighten sex workers' vulnerability to HIV. Many sex workers are migrants and otherwise mobile within nation states and are thus, difficult to be reach via standard outreach and health services. They face cultural, social, legal, and linguistic obstacles to access the services and information. Importantly, many women sex workers experience violence on the streets, on the job or in their personal lives, which increases their vulnerability to HIV and other health concerns. Violence is a manifestation of the stigma and discrimination experienced by sex workers. In all societies, sex worker is highly stigmatized and sex workers are often subjected to blame, labeling, disapproval and discriminatory treatment. Laws governing prostitution and law enforcement authorities play a key role in the violence experienced by sex workers. The risk of sexual transmission of HIV infection is well established. In situations where sex workers do not have access to condoms, HIV prevention information and sexual health services, or are prevented from protecting their health and using condoms for any reason, they are at increased risk of contracting HIV. Violence has a direct and indirect bearing on sex workers' ability to protect themselves from HIV and maintain good sexual health[5].

Among seven subjects with HIV-positive partner, three of them got HIV infection. Having HIV-positive partner was not a risk factor for acquiring HIV infection in this study. The serum HIV-1 RNA level was the main predictor of the risk of transmission. Each log increase in viral load was associated with an increase by a factor of 2.45 in the risk of transmission. Several studies have shown a good correlation between peripheral-blood viral load and seminal plasma and cervical secretions viral load. Viral loads in genital secretions appear to fall in concert with the declines in peripheral-blood viral load after combination therapy[6].

Among subject with multiple patners, seven of them were diagnosed as having HIV infection. There was a positive weak association between having multiple partners and HIV positivity (r = 0.115). On average, each time a monogamous, heterosexual couples in which one partner was HIV-positive has intercourse, the probability that the virus will be transmitted to the uninfected partner was 0.11%[7].

Heterosexual transmission involves a complex interaction between biologic and behavioral factors suggesting that peripheral-blood levels of HIV-1 RNA contribute dramatically to the risk of heterosexual transmission. Serum HIV-1 RNA levels below 1500 copies per milliliter were not associated with transmission, whereas the risk of transmission increased substantially with increasing viral loads[6].

Host factors affecting infectivity have been identified through both population-level studies of HIV transmission and direct measurement of virus in genital secretions. These factors may operate through several interrelated mechanisms. Host susceptibility may be affected by factors linked to inflammation or immune activation that alter either the number of susceptible target cells or the receptivity of those cells. In addition, these same mechanisms may affect the production of virus within infected cells, thereby influencing the infectiousness of the host. Host infectiousness is likely to increase as a function of the concentration of virus in the genital tract. Higher viral loads in the blood have been associated with the transmission to sexual partners of people with transfusion-acquired infections. Data on viral concentration in blood and semen generally support the epidemiologic inferences about the importance of the stage of infection in the transmission of HIV. Recent studies show that HIV is more readily detected, and in some cases is present in higher concentrations, in the blood or semen of men with low CD4 T-lymphocyte counts or more advanced HIV disease than in that of men with higher counts or less advanced disease[8].

The vaginal sex did not contribute to the HIV transmission. In women, the glandular epithelium harbors HIV in the zone of transformation between the columnar and squamous cells of the cervix. Cervical swabs yield HIV DNA more readily than vaginal swabs (33% vs. 17%). In men, HIV is detectable in seminal cells and seminal plasma. Although sperm cells do not express CD4 receptors and are unlikely to be a major source of infection, HIV DNA has been detected in some sperm cells and their precursors[8].

The oral sex also did not contribute in HIV infection in this study. However, like all sexual activity, oral sex also carries some risk of HIV transmission when one partner is known to be infected with HIV, when either partner's HIV status is not known, and/or when one partner is not monogamous or injects drugs. Even though the risk of transmitting HIV through oral sex is much lower than that of anal or vaginal sex, numerous studies have demonstrated that oral sex can result in the transmission of HIV. Measuring the exact risk of HIV transmission as a result of oral sex is very difficult. Additionally, because most sexually active individuals practice oral sex in addition to other forms of sex, such as vaginal and/or anal sex, when transmission occurs, it is difficult to determine whether or not it occurred as a result of oral sex or other more risky sexual activities. Finally, several co-factors may increase the risk of HIV transmission

through oral sex, including oral ulcers, bleeding gums, genital sores, and the presence of other STDs[9].

There was a weak association between anal sex and HIV status, with r-value 0.038, higher than r-value of oral and vaginal sex. Receptive anal sex is associated with the risk of transmitting HIV virus. Cells with HIV-1 receptors were present in all penile epithelia, but Langerhans' cells were most superficial in the inner foreskin and frenulum. The inner foreskin had a significantly thinner keratin layer than the outer foreskin or glans penis. Hence the superficial Langerhans' cells on the inner aspect of the foreskin and frenulum are poorly protected by keratin and thus could play an important role in primary male infection[10].

HIV is more likely to be transmitted during anal sex than during vaginal sex, because the anus is not naturally lubricated, and small tears and lesions that allow HIV to pass from one partner to another can easily occur. This is especially true for the receptive partner, because sperm and other body fluids will remain in the anus after the insertive partner has withdrawn. Anal sex (both insertive and receptive) is also vastly more risky than oral sex. Anal sex is by far the most common sexual practice between men[11].

Among seven IDUs, five were HIV-positive and two were HIV-negative. The lambda value proved that there was a weak association between IDUs and HIV infection (r = 0.115). Blood transfer through the sharing of drug taking equipment, particularly infected needles, is an extremely effective way of transmitting HIV. For many users, sterile syringes are not readily available and drug paraphernalia laws in some countries make it an offence to distribute or possess syringes for non-medical purposes. A lack of awareness or education about safe injecting can also lead to needle sharing. Non-injection drugs also contribute to the spread of the epidemic when users trade sex for drugs or money, or when they engage in risky sexual behaviors that they might not engage in when sober[12].

Our data relied on the medical record and voluntary counselling and testing (VCT) filled by counselor or doctor. Completeness of data is crucial in order to analyze the data. Since the most of the data is not completed well, the power of the study decreases significantly. Some of the risk factors also cannot be evaluated since no subject was exposed to the particular risk factor.

Since being sexually active was the commonest risk factor among attendees of Edelweiss Clinic, education should be given more on safe sex. Further research should be conducted on condoms effectiveness in preventing the transmission of HIV. Doctors and counselors should be aware of the usefulness of VCT form also the importance to get all the information needed from the patients for the sake of the patients as well as the research.

CONCLUSION

Among HIV-positive individuals, 17 (65.4%) were sexually active. It was considered as the most common risk factor. Having multiple partners, IDUs, and anal sex had a weak association with HIV infection. The chance of HIV infection was higher among the IDUs.

REFERENCES

1. World Health Organization (WHO). Review of the health sector response to HIV and AIDS in Indonesia 2007. In: WHO, Regional Office for South-East Asia, 2007:2.
2. Ministry of Health of Indonesia. Quarterly report of HIV-infected and AIDS cases as of December 2006 in Indonesia. In. Jakarta: Ministry of Health of Indonesia, 2006.
3. National AIDS Commission Republic of Indonesia. Country report on the follow up to the declaration of commitment on HIV/ AIDS, reporting period 2006-2007. In. Jakarta: National AIDS Commision Republic of Indonesia, 2008.
4. Joesoef MR, Linnan M, Barakbah Y, Idajadi A, Kambodji A, Schulz K. Patterns of sexually transmitted diseases in female sex workers in Surabaya, Indonesia. Int J STD AIDS, 1997;8:576-80.
5. World Health Organization (WHO). Violence against sex workers and HIV prevention. In, 2005.
6. Quinn TC, Wawer MJ, Sewankambo N, et al. Viral load and heterosexual transmission of human immunodeficiency virus type 1. Rakai Project Study Group. N Engl J Med, 2000;342: 921-9.
7. Hollander D. Title Risk of HIV transmission is raised by high viral load, presence of genital ulcers. International Family Planning Perspectives, 2001;27:156. .
8. Royce RA, Sena A, Cates W, Jr., Cohen MS. Sexual transmission of HIV. N Engl J Med, 1997; 336:1072-8.
9. Center for Disease Control and Prevention. Oral sex and HIV risk, 2009.
10. McCoombe SG, Short RV. Potential HIV-1 target cells in the human penis. AIDS, 2006;20: 1491-5.
11. Monitoring the AIDS Pandemic Network. MAP report 2005, 2005.
12. MSM and HIV. 2009. Avaliable from: URL: http://www.avert.org/msm-hiv.htm.