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Association between sexual orientation and sexual contact with the incidence of human immunodeficiency virus (HIV) infection in Dr. Sardjito General Hospital, Yogyakarta

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ABSTRACT

Anal intercourse has been known to have a high risk of human immunodeficiency virus **(**HIV) transmission. The objective of this study was to evaluate the relationship between sexual orientation and the mode of sexual contact with the incidence of HIV infection. This was observational analytic study with cross sectional design. Subjects were new male patient who visited sexually transmitted infection (IMS) clinics at Dr. Sardjito General Hospital, Yogyakarta during 2016. Data were obtained from medical records. The HIV status was established from HIV rapid test and enzyme-linked fluorescent assay (ELFA). Data were analyzed using descriptive test and Pearson's chi-squared test with significance level of p< 0.05. Among 167 subjects, 47.91% were in the age group 17 - 25 years old. Forty subjects (24%) had HIV positive status. The majority of subjects were heterosexuals (111 subjects (66.47%)), 43 subjects (25.75%) were homosexuals, and 13 subjects (7.8%) were bisexuals. HIV positive subjects were more common in homosexual groups than were heterosexual and bisexual (p <0.05). The majority of subjects made orogenital sexual contact and genito-genital (36%). Only 1% subject with anogenital and genito-genital sexual contact. The most frequent sexual contact were non-anogenital (103 subjects (61.68%)), while the rest made anogenital sexual contact in 64 subjects (31.32%). Anogenital contact was significantly associated with HIV incidence (p <0.5; OR: 14.599; 95% CI: 5.873 – 36.289). Anogenital sexual contact has a 14-fold greater risk of HIV incidence than non-anogenital contact.

ABSTRAK

Hubungan seks anal berisiko terjadinya penularan HIV yang lebih tinggi. Tujuan dari penelitian ini adalah untuk mengkaji hubungan antara orientasi seksual dan cara kontak seksual dengan kejadian infeksi HIV. Penelitia ini meruppakan penelitian analitik observasional dengan rancangan potong lintang. Subjek penelitian adalah pasien pria baru yang mengunjungi klinik *sexually transmitted infection* (IMS) RSUP Dr. Sardjito, Yogyakarta selama tahun 2016. Data diperoleh dari rekam medis. Status HIV ditentukan dari tes cepat HIV dan enzyme-linked fluorescent assay (ELFA). Data dianalisis menggunakan uji deskriptif dan Pearson chi-kuadrat dengan tingkat kebermaknaan p <0,05.. Dari 167 subyek, 47,91% masuk kelompok usia 17 - 25 tahun. Empat puluh subyek (24%) memiliki status HIV positif. Sebagian besar subjek adalah heteroseksual (111 subjek atau 66,47%), 43 subjek (25,75%) homoseksual dan 13 subjek biseksual (7,8%). Subjek HIV positif lebih umum pada kelompok homoseksual daripada heteroseksual dan biseksual (p <0,05). Sebagian besar subjek melakukan kontak seksual orogenital dan genito-genital (36%). Hanya 1% subjek dengan kontak seksual anogenital dan genito-genital. Kontak seksual yang paling sering adalah non-anogenital (103 subjek atau 61,68%), sedangkan sisanya melakukan kontak seksual anogenital di 64 subjek (31,32%). Kontak anogenital secara bermakna dikaitkan dengan kejadian HIV (p <0,5; OR: 14,599; 95% CI: 5,873 - 36,289). Dapat disimpulkan bahwa kontak seksual anogenital memiliki risiko 14 kali lipat lebih besar terhadap kejadian HIV daripada kontak non-anogenital.

Keywords:
human immunodeficiency virus
acquiredimmunodeficiency syndrome
mode of sexual contacts
sexual orientation
risk factors

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INTRODUCTION

Human immunodeficiency virus (HIV) is a lentivirus, a subgroup of retroviruses, a single-stranded RNA virus that causes HIV infection and acquired immunodeficiency syndrome (AIDS) as a later stage.[1] Main transmission of HIV is through sexual intercourse and injection drug use, though it can be transmitted through the mother's placenta to her baby.[2,3] In Indonesia in 2016, based on the HIV and AIDS information system (SIHA) data approximately 190,000,000 cases of HIV were recorded. These HIV cases are dominated by male sex (60.6%), where 25% of all cases have homosexual risk factors.[4]

Lesbians, gay, and bisexuals have a higher risk of this disease than heterosexual individuals.[5] Men who have sex with men (MSM) or homosexuals are among the groups at greatest risk of HIV transmission. The main risk factor for HIV transmission among homosexual individuals is unprotected anal intercourse. The greater risk of HIV transmission is associated with receptive anal intercourse than insertive. In addition, the increased incidence in this group was associated with an increase in the number of sexual partners and the presence of sexually transmitted infections such as syphilis, gonorrhea and herpes simplex virus infection.[6] This study was conducted to evaluate the relationship between sexual orientation and sexual contact mode of HIV incidence in the male subjects group.

MATERIALS AND METHODS

Study design and sample criteria

This was observational study with cross sectional design. The subjects of the study were male new patients who visited the IMS Clinics of Dr. Sardjito General Hospital, Yogyakarta, during 2016. Data were obtained from the patient's medical records, including personal history and diagnosis of illness. The diagnosis of HIV infection was through HIV rapid test and enzyme-linked fluorescent assay (ELFA) laboratory tests.

Subjects were grouped into three groups of sexual orientation. First is heterosexual group if they have a female sex partner only. Second is homosexual if they have male sex partners as well as transgender. The last is bisexual if they have male and female sexual partners.

The mode of sexual contact was classified into three groups, i.e. anogenital mode of sexual contact if in sexual intercourse involving genital and anal, orogenital if involving genital and oral, and genito-genital if involving genital only. Subjects may perform one or more of these mode of sexual contact in sexual intercourse. To prove that anal sexual contact is more risky than non-anal, the group of sexual contacts was regrouped into two major groups: anogenital and non-anogenital (orogenital and genito-genital).

Data analysis

The descriptive analysis was performed to see the subject demographics. While the relationship between sexual orientation and sexual contact mode of HIV incidence were analysed by Chi square test. A p value <0.05 was considered to be significant.

RESULTS

Based on patient visit data during 2016, 167 new male HIV patients were included in this study. The subject's demographic data are shown in TABLE 1 and the age group is shown in FIGURE 1. There ware categorized into 5 groups of age. The majority of subjects (80 subjects or 48%) were 17-25 years old (y.o.). Based on the last education as shown in FIGURE 2, the majority of subjects had the last high school education or equivalent as many as 81 subjects (41.5%). Most subjects were college student as many as 58 subjects (34.73%), followed by 47 private workers (28.14%), and 20 subjects (11.98%) did not have occupations.

TABLE 1. Subject demographic data by occupation

Patient occupation	Frequency	%
College student	58	34.73
Private Worker	47	28.14
Entrepreneur	20	11.98
No occupation	20	11.98
Sex workers	6	3.59
Laborer/sailor	6	3.59
Entertainer/artist	4	2.40
Government employees/army/police	4	2.40
Non-medical professionals	2	1.19
Total	167	100

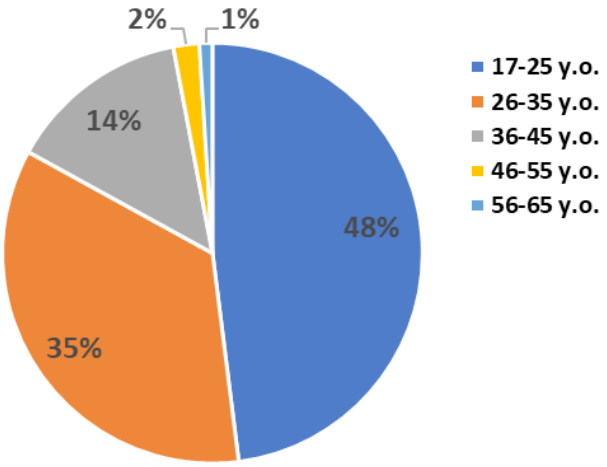

FIGURE 1. Subject demography based on age groups

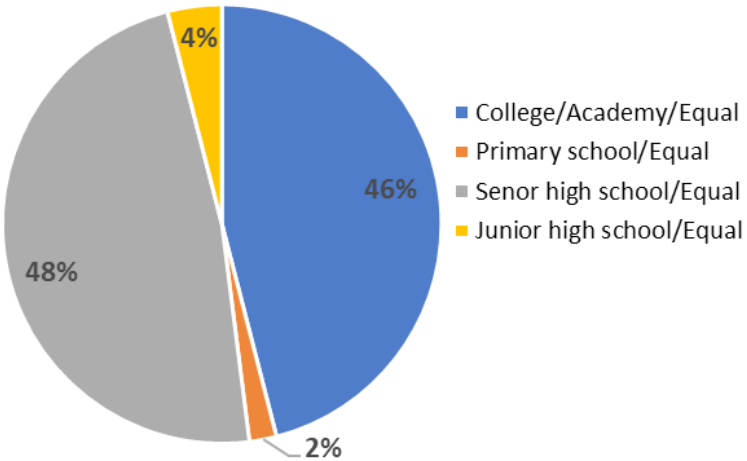

FIGURE 2. Subject demography based on last education

Among 167 subjects there were 127 subjects (76%) with HIV negative status and 40 subjects (24%) with HIV positive (FIGURE 3).

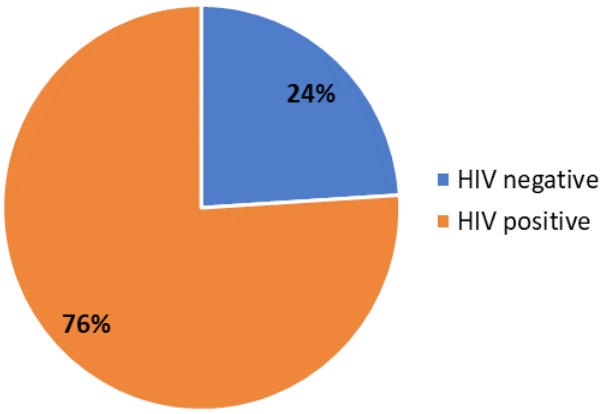

FIGURE 3. HIV status of the subjects

The distribution of sexual orientation is shown in FIGURE 4, which was divided into 3 groups; heterosexual, homosexual, and bisexual. The most sexual orientation was heterosexual while bisexual was the least sexual orientation (8%).

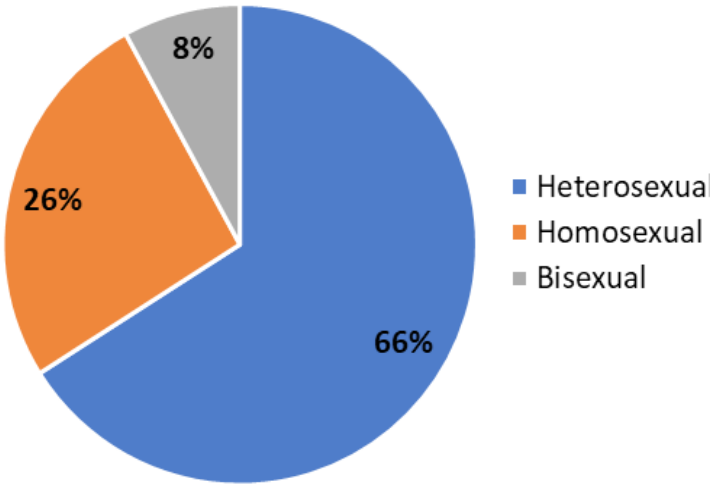

FIGURE 4. Frequency of subjects based on sexual orientation

A Chi square analysis was conducted to evaluate the association between risk factors of sexual orientation of patients with HIV status (FIGURE 5). Heterosexual risk factors had a significant relationship to HIV negative status, whereas homosexual risk factors had a significant relationship to HIV positive status ($p = 0.00$).

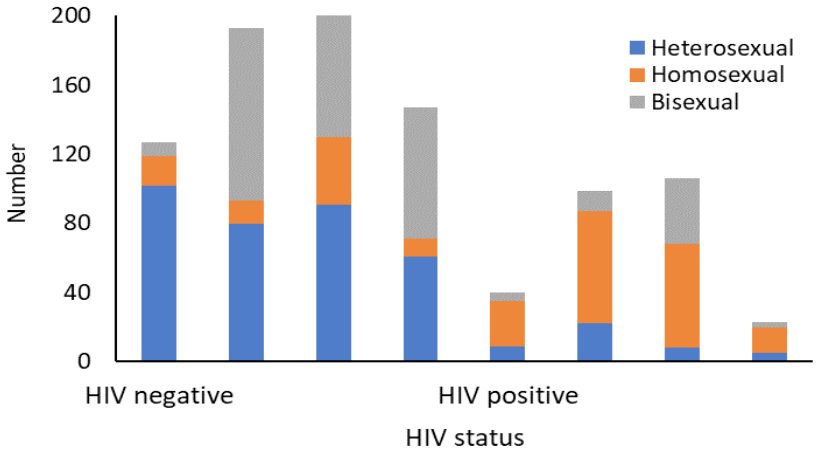

FIGURE 5. Diagram of sexual orientation based on HIV status

The groups of contact were regrouped into two groups, i.e. anogenital and non-anogenital. The relationships between modes of sexual contact with HIV incidence are shown in TABLE 2. The mode of anogenital sexual contact significantly influenced the incidence of HIV (p = 0.000; OR = 14.59; 95% CI : 5.87 - 36.28).

TABLE 2. The relationship between mode of sexual contact with HIV incidence

Mode of sexual contacts	HIV positive [n (%)]	HIV negative [n (%)]	p
Anogenital	33 (19.76)	31 (18.56)	0.000
Non-anogenital	7 (4.19)	96 (57.48)	
Total	40 (24%)	127 (76)	167 (100)

OR: 14.59; 95% CI: 5.87 – 36.28

DISCUSSION

Sexual orientation is defined as a component of one's identity and one's emotional attraction to another, and the behavior that can arise from this attraction. A person can be attracted to men, women, or both. An individual can be identified as heterosexual, homosexual, or bisexual.[7]

This study showed that HIV-positive subjects were more likely to be homosexual than heterosexual and bisexual. This was in accordance with previous studies which suggest that male-related male or homosexual male-risk factors are the group of individuals who had the highest risk of HIV transmission.[8,9] However, this was less agree with the survey by centers of disease control and prevention (CDC) between 2008 - 2014 in the United States. The data showed the same frequency between heterosexual and other sexual orientations (homosexual and bisexual) that is 36% of all subjects with HIV positive. The number was concluded to decrease the number of new cases each year, except for homosexual and bisexual groups that do not decrease the number of new cases.[10]

The mode of sexual contact will be different for each group of individuals with different sexual orientations.[11]

Various literature suggests that anal intercourse increases the risk of transmission of HIV infection, that consistent to this study results. It was found that the mode of anogenital contact was associated with the incidence of HIV infection with OR 14.599 (95% CI: 5.87 - 36.299). Anal sexual intercourse had the highest risk for HIV transmission, whereas vaginally had a lower risk and orally has the lowest risk.[12,13]

The various cofactors suspected of contributing to HIV transmission include trauma, inoculation size, disease stage, and viral load (VL) of the partner who is the source of HIV transmission.[14] The squamous epithelial layer of the rectal mucosa is thinner and more susceptible to minor trauma, making it easier for the entrance to the virus. In addition, the rectal mucosa does not have humoral immune defenses as in the cervicovaginal secretions of the local immune system.[13,15] Factors affecting HIV shedding of the rectum are the overflow of activated lymphocytes in the inflamed inoculation area due to anogenital trauma.[16] These lymphocytes are a major target of HIV, which is also contained in high concentrations in the prepuce. It may also explain why circumcision may reduce the risk of HIV transmission.[17]

Stage of HIV infection is associated with viral concentrations in a body fluid or VL. Previous research suggested that rectal secretions have a higher VL than other body fluids, even higher than in the blood. Meanwhile, VL in cement fluid is higher than in vaginal secretions, and saliva from the mouth has the lowest concentration.[14,16] This allows the anogenital transmission risk to be higher than for other sexual contacts. Anogenital contact is more commonly done by homosexuals than heterosexual and bisexual. A person with a heterosexual and bisexual orientation will have variation in every sexual relationship, whereas homosexuals only make anal contacts.

The results in this study showed the risk of HIV occurrence in anogenital contacts up to 14 times greater than other sexual contacts. Although it supported pre-existing research results, the anogenital risk was slightly greater than that previously reported in varying studies.[18,19] The difference may be due to the sub-grouping of subjects, research methods and fewer number of subjects in this study. Some previous studies included women and men as research subjects but in this study included men only, so the risk factors analyzed became more specific. The weakness of this study was not to divide the group of anogenital mode of sexual contact becomes receptive and insertive.

CONCLUSION

The majority of patients have heterosexual sexual orientation and thus encounter most genito-genital and orogenital sexual contacts than any other sexual contact. HIV positive subjects are more common in homosexual groups than in heterosexual and bisexual groups. Anogenital sexual contact mode has a 14-fold greater risk of HIV incidence than non-anogenital contact.

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