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Risk Factors of Syphilis and HIV/AIDS Coinfection

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ABSTRACT

Background: Syphilis infection and HIV are major health problems worldwide. Both of these diseases can be transmitted through sexual contact, so often a person suffers from both diseases at the same time. **Purpose:** To describe the risk factors of syphilis and HIV/AIDS coinfection in the Infectious Disease Intermediate Treatment Unit (UPIPI) inpatient and outpatient ward of Dr. Soetomo General Academic Hospital in 2019. **Methods:** The study design used in this study is a retrospective descriptive study aimed at evaluating sexual and non-sexual factors that cause syphilis and HIV coinfection. The research population was patients in the inpatient and outpatient rooms of UPIPI RSUD Dr. Soetomo Surabaya for the January-December 2019 period. The sampling technique was sourced from secondary data, namely medical record data from the inpatient and outpatient rooms of UPIPI RSUD Dr. Soetomo Surabaya for the period January-December 2019. The data in this study were obtained from medical records and patient biodata. **Result:** Based on the calculation results, it is known that age group (P=0.022>0.05), and gender (P=0.024>0.05) had no effect on the risk of syphilis and HIV coinfection, while marital status (P=0.048<0.05), sexual orientation (P=0.048<0.05), transmission model (P=0.044<0.05), and type of work (P=0.046<0.05) afected the risk of syphilis and HIV coinfection. **Conclusion:** People with HIV/AIDS are expected to be active in participating in programs that are needed by patients, such as antiretroviral (ARV) therapy assistance programs and counseling that will prolong the quality of life in various aspects of life, both physical, psychological and social aspects.

Keywords: *syphilis, HIV/AIDS, risk factor, coinfection, human & medicine.*

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BACKGROUND

HIV and sexually transmitted co-infections have received increasing attention as public health problems in the last decade. A study and observations related to HIV/AIDS and other STIs have been carried out since the first epidemic, and show a synergistic relationship between HIV/AIDS and other STIs, namely, people with sexually transmitted infections are more at risk of HIV infection and people coinfected with HIV and STIs have a higher probability of transmitting HIV/AIDS and other larger STIs ones.[1] In 2017, the Indonesian Ministry of Health reported the number of positive HIV cases along with STIs as many as 14,493 cases. [2]

Syphilis infection and HIV are major health problems worldwide. Both of these diseases can be transmitted through sexual contact, so often a person suffers from both diseases at once. Syphilis has been shown to increase the sexual transmission of HIV infection, whereas HIV infection can lead to changes in the clinical manifestations of syphilis, faster progression, more difficult diagnosis, an increased risk of neurological complications, and an increased risk of failure of therapy with standard regimens. [3]

Research by Snowden *et al.* (2010) shows that sexual orientation affects syphilis infection, namely that homosexual men have a five times greater risk of being infected with syphilis than those who are heterosexual.[4] Research by Widasmara (2017) shows

as many as 41% of women and 21% of men. Meanwhile, for sex workers, 19% of women and 31% of men often have sexual relations with commercial sex workers and male sex workers.[5] Research in Malaysia, from 370 CSWs found syphilis by 13.6% while for the survey of CSWs in Burkina Faso - Africa, the incidence of syphilis was 22%. The proportion of syphilis among sex workers in the United States is 18%. Based on the description above, this study aims to determine the risk factors of syphilis and HIV/AIDS coinfection.[6]

METHODS

The study design used in this study was a retrospective descriptive study aimed at evaluating sexual and non-sexual factors that cause syphilis and HIV coinfection. The study population was patients in the inpatient and outpatient rooms of UPIPI RSUD Dr. Soetomo Surabaya period January-December 2019. The sampling technique was sourced from secondary data, namely medical record data from the inpatient and outpatient rooms of UPIPI RSUD Dr. Soetomo Surabaya for the period January-December 2019. This study analyzed the univariate and bivariate associations with Statistical Product and Service Solution (SPSS) 23.0 with a statistically significant value P<0.05.This research has been reviewed and approved by the Ethics Committee at Dr. Soetomo General Academic Hospital Surabaya (1821/KEPK/II/2020).

RESULT

This study involved 25 patients who were treated at Dr. Soetomo Surabaya in January-December 2019. The data in this study were obtained from medical records and patient biodata. The data obtained are primary data, then the data were analyzed both univariate and bivariate with Statistical Product and Service Solution (SPSS) 23.0 for Windows and analyzed using Chi Square statistical calculation technique.

Table 1. Frequency distribution of syphilis and HIV coinfection data by age

No	Age Group (Years)	Amount		Total (n)	%	p (sig)
		Inpatient	Outpatient			
1	17-25	1	14	15	60%	
2	26-35	2	6	8	32%	
3	36-45	0	1	1	4%	0.022
4	46-55	1	0	1	4%	
	Total (n) (%)	4 (16%)	21(84%)	25	100%	

Based on Bivariate Analysis, Sig. 0.221 > (0.05) which means that age does not have a risk of syphilis and HIV infection.

Table 2. Frequency distribution of syphilis and HIV coinfection data by sex

No	Gender	Amount		Total (n)	%	p (sig)
		Inpatient	Outpatient			
1	Man	3	21	24	96%	
2	Woman	1	0	1	4%	0.242
	Total (n) (%)	4(16%)	21(84%)	25	100%	

Based on Bivariate Analysis, Sig. 0.242 > (0.05) which means that gender does not have a risk of syphilis and HIV infection.

Table 3. Frequency distribution of syphilis and HIV coinfection data by marital status

No	Marital status	Amount		Total (n)	%	p (sig)
		Inpatient	Outpatient			
1	Married	2	8	12	48%	
2	Not Married	2	13	13	52%	0.048
	Total (n) (%)	4(16%)	21(84%)	25	100%	

Based on the results of the Bivariate analysis, the Sig. of 0.048 < (0.05) which means that marital status affects the risk of co-infection with syphilis and HIV.

Table 4. Frequency distribution of syphilis and HIV coinfection data based on sexual orientation

No	Sexual Orientation	Amount		Total (n)	%	p (sig)
		Inpatient	Outpatient			
1	Biseksual	2	5	7	28%	0.047
2	Homoseksual	4	8	12	48%	
3	Heteroseksual	3	3	6	24%	
	Total (n) (%)	9(36%)	16(64%)	25	100%	

Based on the results of the Bivariate analysis, the Sig. of 0.047 < (0.05) which means that sexual orientation affects the risk of co-infection with syphilis and HIV.

Table 5. Frequency distribution of syphilis and HIV coinfection data by model of transmission

No	Transmission Model	Amount		Total (n)	%	p (sig)
		Inpatient	Outpatient			
1	Sexual	9	12	21	84%	0.044
2	Injecting drug users	0	2	2	8%	
3	Medical Action (Transfusion)	1	1	2	8%	
4	Vertical from Mother to Fetus	0	0		0%	
	Total (n) (%)	10(40%)	15(60%)	25	100%	

Based on the results of the Bivariate analysis, the Sig. of 0.044 < (0.05) which means that the transmission model affects the risk of co-infection with syphilis and HIV.

Table 6. Frequency distribution of syphilis and HIV coinfection data by type of occupation

No	Occupation	Amount		Total (n)	%	p (sig)
		Inpatient	Outpatient			
1	Private Employee	0	7	7	28%	0.046
2	College Student	1	3	4	16%	
3	Unemployed	0	4	4	16%	
4	Driver	0	3	3	12%	
5	Teacher	1	1	2	12%	
6	Housewife	1	0	1	4%	
7	Fisherman	0	1	1	4%	
8	Union Employees	1	0	1	4%	
9	Sailor	0	1	1	4%	
10	Porter	0	1	1	4%	
	Total (n) (%)	4(16%)	21(84%)	25	100%	

Based on the results of the Bivariate analysis, the Sig. of 0.046 < (0.05) which means that the occupation affects the risk of co-infection with syphilis and HIV.

DISCUSSION

HIV transmission occurs through several modes of transmission, among which the most dominant is through sexual contact, injection needles, mother to baby and blood transfusions. Meanwhile, Cohen (2011) revealed that almost 80% of cases of infection worldwide until 2010 occurred through sexual contact.[7] As for the risk of transmission, HIV/AIDS sufferers are mostly transmitted due to unsafe heterosexual relationships (e.g., multiple partners, unprotected sex), and IUDs/IDUs (injecting drug users). In the United States, both syphilis and HIV are highly concentrated epidemics among gay, bisexual, and other men who have sex with men (MSM).[8]

Based on Table 1. it can be concluded that age 17-25 has the highest risk of co-infection with syphilis and HIV with 15 patients (60%), the risk of second coinfection is in the age range of 25-35 years with a total of eight patients. (32%), followed by the age range of 36-45 years and 46-55 years, each of which is one person (4%). Based on the results of the bivariate analysis, the Sig. of 0.022 > (0.05), which means that

age does not have a risk of syphilis and HIV infection. Age is one of the characteristics that can describe the condition of an individual. It is stated that age is one of the underlying determinants of HIV infection. This is in accordance with research in 1991-1994 in Mwanza, Tanzania which showed that men in the age group 20-34 years and 35-54 years were more at risk than the 15-19 year age group affecting the incidence of HIV.[9] The results of the IBBS Survey (Integrated Behavior and Biological Survey) on IDUs in the Pokhara Valley in 2009 showed that HIV prevalence was higher among those aged 20 years and over. However, age did not affect the risk of co-infection with syphilis and HIV.[10] This is very possible where the transmission of HIV and syphilis in general will be more risky when someone has sexual intercourse.[10] Most data in Indonesia are DKI Jakarta 48,502, East Java 35,168, Papua 27,052, West Java 26,066, Central Java 19,272, and Bali 15,873, the most are in the productive age of 20-39 years.[11]

Based on Table 2. it can be concluded that male gender is more at risk of syphilis and HIV co-infection with 24 patients (96%) while only one patient (4%). Based on the results of the bivariate analysis, the Sig. of 0.242 > (0.05), which means the species has no risk of syphilis and HIV infection. Gender is a physiological difference that characterizes a person as male or female. From an anatomical point of view, women's physiology is "accommodating" so that it will facilitate infections that are not realized. Because the female reproductive organs are very delicate, they are easy to get injured, which can accelerate the entry of germs. In this study, gender was declared to have no effect on the incidence of HIV and AIDS because it was possible that there were still limitations in the number of samples. Men make up almost 65% of the total. HIV prevalence of 5% or more occurs in men who have sex with men, sex workers and transgender people; this is not only in countries known to have concentrated epidemics but also in countries mostly in the east and south Africa.[12] In many cases, it is often found that men consume more narcotics with syringes than women and men often have sexual relations with multiple partners. Another reason is because the male population is greater; a woman serves several men so that only one woman is affected.[13]

Based on Table 3, it can be concluded that there are more HIV patients with unmarried status, namely 13 people (52%), While HIV patients with married status were 12 people (48%). Based on the results of the Bivariate analysis, the Sig. of 0.048 < (0.05), which means that marital status affects the risk of co-infection with syphilis and HIV.[14] The results of the IBBS Survey (Integrated Behavior and Biological Survey) on IDUs in Pokhara Valley in 2015 showed that the prevalence of HIV among married IDUs was higher (6.6%) than unmarried IDUs (1.7%). Individual behavior is still heavily influenced by the environment. Factors that directly or indirectly affect the incidence of HIV infection are family characteristics which include the level of family stability, communication and relationships with partners and marital status.[15] Regarding family instability,research on marital status related to risky behavior and increased HIV infection in Vancouver Canada concluded that unstable family circumstances are associated with increased risk of contracting HIV.[16] Another factor of family characteristics associated with HIV-risk sexual behavior at a young age is marital status. Puffer *et al.* in their research in rural areas of Kenya found that marital conditions tend to influence high-risk behavior (unprotected sexual relations or with multiple partners).[17] Peltzer and Pengpid, (2011) in their research in Thailand, stated that one of the reasons for marital breakdown is related to a lack of family harmony and economic conditions. [18]

Based on Table 4. it can be concluded that HIV sufferers with homosexual orientation have the highest score, namely 12 people (48%), followed by bisexual as many as seven people (28%) and sufferers with heterosexual orientation as many as six people (24%). Based on the results of the bivariate analysis, the Sig. of 0.047 < (0.05), which means that sexual orientation affects the risk of co-infection with syphilis and HIV. One of the main routes of transmission of HIV/AIDS is through unsafe sex with an HIV-infected partner, be it heterosexual or homosexual. Transmission of HIV in the last 10 years has shifted from transmission through needles contaminated with HIV and not sterile to transmission through sexual contact. Data from the Ministry of Health in 2012 showed that there were around nine million people at high risk of contracting or transmitting HIV, the population at risk includes homosexual FSW (MSM). Erawati (2020) stated that the homosexual community and female sex workers are a group that is vulnerable to HIV infection.[19]

Based on Table 5. it can be concluded that HIV sufferers with a sexual transmission model have the highest risk of transmission with 21 patients (84%), followed by non-sexual transmission (IDUs) as many as two patients (8%), followed by transmission from medical procedures. as many as two patients (8%), while vertically from mother to fetus is zero patients (0%). Based on the results of the bivariate analysis, the Sig. of 0.044 < (0.05), which means that the transmission model affects the risk of co-infection with syphilis and HIV. This is in accordance with data from the Ministry of Health (2019) which show that there

has been an increase in cases of people living with HIV through sexual transmission; the number of people living with HIV in these circles was recorded as 27,687 people. HIV infection and syphilis can be transmitted through sexual intercourse, so a person can suffer from both diseases at the same time. Sexual transmission ranks highest in the transmission of syphilis and HIV infections. In addition, non-sexual transmission of syphilis infection can occur in congenital syphilis that occurs in infants who are transmitted transplacentally from pregnant women infected with syphilis.[20] In addition, non-sexual transmission can be through the use of shared needles between people who are injection drug users, blood transfusions, and accidents to officers in laboratories and health workers.[21]

Based on Table 6, the incidence of HIV/AIDS with syphilis coinfection was highest in the group of people with private employee status as many as seven people with a percentage of 28%. Furthermore, patients with working status as students and patients with unemployed status were found with a total of four people with a percentage of 16%, followed by patients with driver status as many as three people with a percentage of 12%, and patients with working status as teachers as many as two people with a percentage of 8%. The remaining five people were each recorded as patients with status as housewives, fisherman, union employees, sailor, and porter. This is in accordance with data compiled by the Ministry of Health until 2019 showing that the professions with the most HIV-AIDS sufferers are 17,887 employees or non-professional staff, followed by 16,854 housewives and 15,235 private employees.[21] Based on the results of the bivariate analysis, the Sig. of 0.046 < (0.050), which means that the occupation affects the risk of co-infection with syphilis and HIV. High mobility and interaction can be a factor in the emergence of sexual attraction and relationships. The above results are in line with the theory of Daili et al. which explains that a person's job often has a close relationship with the possibility of contracting STIs. Research conducted by Wu et al. showed that someone who worked in bars, karaoke places, and bathhouses had a higher chance of having sexual intercourse compared to those who worked individually. High intensity of social interaction can spark interest and increase probability of sexual intercourse and can be a source of spreading of sexually transmitted diseases if not done in a safe way.[22]

Based on the calculation results, it is important to carry out syphilis examinations on all newly diagnosed HIV-infected patients so that early management of syphilis coinfection in HIV patients can be carried out in order to improve the quality of life of these patients. During the first six months of exposure to syphilis, HIV screening is necessary because it is the time most at risk of contracting HIV infection.[23] People with syphilis with HIV / AIDS generally have a more severe picture of the disease. Syphilis treatment and ARV (antiretroviral) therapy assistance programs as well as counseling are important to do to prolong the quality of life in various aspects of life, both physical, psychological and social aspects.[24]

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