



ORIGINAL RESEARCH

CHARACTERISTICS AND OPPORTUNISTIC INFECTIONS OF AIDS PATIENTS IN EAST JAVA PROVINCE IN 2018

Karakteristik dan Infeksi Opportunistik Pasien AIDS di Provinsi Jawa Timur Tahun 2018

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ABSTRACT

Background: Acquired immunodeficiency syndrome (AIDS) is a health problem in East Java. Opportunistic infections are one of the causes of morbidity and mortality in patients with human immunodeficiency virus (HIV) and AIDS in Indonesia. **Purpose:** This study aimed to describe the characteristics and opportunistic infections of AIDS patients in East Java Province, 2018. **Methods:** This study was conducted as observational descriptive research, and a survey was used as the research design. The research location was in East Java Provincial Health Office, and the study was carried out in August 2019. We used secondary data taken from the results of surveillance of AIDS patients in 2018. The sampling method of the study was total sampling, with 1,138 AIDS patients. The variables studied included the patients' characteristics (sex, age, type of work, and risk factors) as well as the number and types of opportunistic infections. **Results:** The majority of the AIDS patients in East Java in this sample were male (70.74%), belonged to the adults (26–45 years old) group (62.65%), and worked as employees/laborers (46.08%). In terms of sexual orientation, the majority were heterosexuals (81.81%) or homosexuals (10.63%). The majority of patients experienced one type of opportunistic infection (46.08%), with histoplasmosis (48.77%) and tuberculosis (TB) (42.62%) as the most frequently experienced opportunistic infections. **Conclusion:** Characteristics that are risk factors for contracting AIDS in East Java include being male, being of adult age, working as an employee/laborer, and being heterosexual. There are also risks of opportunistic infections, particularly histoplasmosis and TB.

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ABSTRAK

Latar Belakang: *Acquired Immunodeficiency Syndrome (AIDS)* merupakan masalah kesehatan di Jawa Timur. Salah satu penyebab morbiditas dan mortalitas pada penderita *Human Immunodeficiency Virus (HIV)* dan *AIDS* di Indonesia adalah infeksi oportunistik. **Tujuan:** Penelitian ini bertujuan untuk menggambarkan karakteristik dan infeksi oportunistik pasien *AIDS* di Provinsi Jawa Timur pada tahun 2018. **Metode:** Penelitian ini merupakan penelitian observasional deskriptif dengan desain penelitian survei. Lokasi penelitian di Dinas Kesehatan Provinsi Jawa Timur dan dilaksanakan pada bulan Agustus tahun 2019. Penelitian ini menggunakan data sekunder yang diambil dari hasil surveilans pasien *AIDS* tahun 2018. Cara pengambilan sampel yaitu total sampling dengan 1138 pasien *AIDS*. Variabel yang diteliti antara lain karakteristik pasien (jenis kelamin, usia, jenis pekerjaan dan faktor risiko) serta jumlah dan jenis infeksi oportunistik. **Hasil:** Mayoritas pasien *AIDS* di Jawa Timur berjenis kelamin laki-laki (70,74%), termasuk dalam kelompok usia dewasa (62,65%), bekerja sebagai karyawan/buruh (46,08%), dan memiliki perilaku berisiko heteroseksual (81,81%) dan homoseksual (10,63%). Mayoritas pasien mengalami 1 jenis infeksi oportunistik (46,08%), dengan histoplasmosis (48,77%) dan tuberkulosis (TB) (42,62%) sebagai jenis infeksi oportunistik yang paling banyak dialami. **Kesimpulan:** Karakteristik yang berisiko terkena *AIDS* di Jawa Timur antara lain berjenis kelamin laki-laki, berusia dewasa, mayoritas bekerja sebagai karyawan/buruh dengan faktor risiko heteroseksual, serta jenis infeksi oportunistik histoplasmosis dan TBC.

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INTRODUCTION

Acquired immunodeficiency syndrome (AIDS) is a collection of symptoms or syndromes that arise due to a decrease of immunity caused by infection with the human immunodeficiency virus (HIV). When the HIV virus enters the human body, it can weaken and even kill white blood cells and multiply, thereby weakening the immune system. If patients are not provided with anti-retroviral virus (ARV) treatment within 5–10 years of being infected with HIV, they will experience a collection of opportunistic infections (OIs) caused by a decrease in immunity, called AIDS (Sonenklar, 2011).

According to the World Health Organization, around 3.90 million people in the world lived with HIV in 2018, and 1.70 million people were newly infected in 2018. 10% of them were from Southeast Asian people. Indonesia is the country with the fifth-highest risk rate of HIV and AIDS in Asia. The number of people infected with HIV in Indonesia by 2017 was 280,623, with 102,667 AIDS patients. East Java Province was the

province with the second-highest number of HIV cases (after DKI Jakarta), with a total of 39,633, while the number of AIDS cases reported up to 2017 was 18,243 (Ministry of Health RI, 2018).

The ratio of men–women among AIDS patients is around 2:1 (64%:36%). All age groups have the possibility of being infected with HIV. Based on data from the HIV–AIDS information system and regarding sexually transmitted infections, the age group with the highest proportion of AIDS patients in 2017 was adults aged 30–39 (Ministry of Health RI, 2018).

Transmission of the HIV virus that is known today is through sexual contact (homosexual or heterosexual), blood (including the use of syringes), and trans-placental or perinatal transmission (mother to fetus). AIDS can affect anybody, and especially those that are in certain key populations: injecting drug users (IDUs), female sex workers, sex workers' customers/partners, homosexuals, transvestites, male partners in same-sex relationships, and prisoners/remanded prisoners (Ministry of Health RI, 2013).

A decrease in the immune system of AIDS patients can result in various infections; these are called opportunistic infections. These are one of the causes of morbidity and mortality in people with HIV and AIDS in Indonesia (Sumiyati & Widjanarko, 2015). Opportunistic infections differ between areas and regions due to differences in pathogenic microbial patterns. Research conducted by Saktina & Satriyasa (2017) in Sanglah, Bali found that the most common type of opportunistic infection in AIDS patients hospitalized at Sanglah General Hospital was candidiasis (28.30%), followed by wasting syndrome (24.20%), while research in Tuzla found that the most common opportunistic infections were tuberculosis (TB) and pulmonary infections (Ahmetagic et al., 2015).

Collecting data on opportunistic characteristics and infections in AIDS patients is very important as a reference source for planning AIDS prevention programs to ensure that they will be on target. Although the number of AIDS patients in East Java is relatively high, data analysis research has never been carried out in this area; therefore, the current study is crucial. This research aims to describe the characteristics and opportunistic infections of AIDS patients in East Java in 2018.

METHODS

This study had a descriptive observational survey research design. The location of the study was the East Java Provincial Health Department, and the research was carried out in August 2019. The sampling method used was total sampling, with 1,138 AIDS patients. The inclusion criteria of this study were that the patients had been diagnosed with AIDS in 2018 in health centers and hospitals in East Java.

The variables studied included patients' characteristics (sex, age, type of work, and risk factors) as well as the number and types of opportunistic infections contracted. The ages of the respondents diagnosed with AIDS were categorized into 4 groups: children (5–11 years old), teenagers (12–25 years old), adults (26–45 years old), and elderly people (>45 years old). The risk factors were defined as factors that had the potential to cause AIDS transmission, while opportunistic infections were infections experienced by patients after being diagnosed with AIDS. This study used secondary data taken from the results of the 2018 AIDS patient surveillance program conducted by the Prevention and Control of Infectious Diseases (P2PM) section of the East

Java Provincial Health Department and described using frequency tables (Ministry of Health RI, 2018). AIDS patient surveillance is a form of activity regulated by the Minister of Health Regulation No. 21 of 2013 concerning HIV and AIDS Prevention (Ministry of Health RI, 2013). Ethics approval was obtained from the Ethics Committee of the Faculty of Dental Medicine, Universitas Airlangga (Number 007/HRECC.FODM / I / 2020).

RESULTS

In this study sample, the number of male AIDS patients (70.74%) was higher than the number of female AIDS patients (29.26%). Most of the patients were in the adult age range of 26–45 years (62.65%), while the lowest proportion were children aged 0–11 years (4.22%).

The frequency distribution of the research subjects by type of work can be seen in Table 1. Employees/laborers represented the highest proportion of AIDS patients with 517 people (46.08%), whereas the lowest proportion was in Military/Police jobs (12 people; 1.07%). Table 1 also shows that 81.81% of the patients in the sample were of heterosexual sexual orientation. The second largest proportion of patients were of homosexual sexual orientation, representing 10.63% of the sample. Blood transfusion was the risk factor for a smaller proportion of the patients than any other risk factor (0.26%).

The frequency distribution of research subjects based on number and types of opportunistic infections can be seen in Tables 2 and 3, respectively. Based on the observed data, some of the AIDS patients (27.15%) had not experienced any opportunistic infections. The largest proportion of patients had experienced one opportunistic infection (28.03%), while the lowest proportion had experienced six types of opportunistic infection (0.18%). Histoplasmosis and TB were the most common types of opportunistic infection experienced by these AIDS patients, with 48.77% having contracted histoplasmosis and 42.62% having had TB.

DISCUSSION

Gender

Based on the East Java Provincial Health Office (2018), there were more male AIDS patients than female patients. This trend is in line with the current results showing a higher proportion of male AIDS patients (70.74%) than of

female patients. The ratio between male and female patients is around 2.41:1. The results of the current study are also in line with the finding of Ahmetagic et al (2015) that male AIDS patients are 4.60x more common than female AIDS patients.

Table 1
Distribution of AIDS Patients in East Java Province in 2018 Based on Characteristics

Variable	n	%
Gender		
Male	805	70.74
Female	333	29.26
Age		
Children	48	4.22
Adolescent	96	8.44
Adult	713	62.65
Elderly	281	24.69
Occupation		
Employees/ laborers	521	45.78
Housewives	177	15.55
Criminal	18	1.58
Prostitute	20	1.76
Student	27	2.37
Entrepreneurs	213	18.72
Military/Police	16	1.41
Unknown	146	12.83
Faktor Risiko		
Perinatal	47	4.13
Transfusion	3	0.26
Injecting Drug User	26	2.28
Homosexual	121	10.63
Heterosexual	931	81.81
Bisexual	10	0.88
Total	1138	100.00

Table 2
Distribution of AIDS Patients in East Java Province in 2018 Based on Number of Opportunistic Infections

Number of Opportunistic Infections Types	n	%
None experienced	309	27.15
1 type	319	28.03
2 type	263	23.12
3 type	149	13.09
4 type	79	6.94
5 type	17	1.49
6 type	2	0.18
Total	1138	100.00

The HIV virus can be transmitted to anyone, meaning that both men and women can be

infected, however, the transmission of the virus is strongly influenced by the presence of risky behavior. The larger proportion of male AIDS patients could be caused by more men carrying out risky activities involving a source of transmission of the HIV virus such as free sex, sexual activities with more than one partner, and drug abuse, especially by injection methods. In their study, Mahmudah, Yaunin, & Lestari (2016) report that risky sexual behavior in adolescents is more prevalent among men than women. Butarbutar, Lubis, & Hiswani (2015) also report significant proportional differences between genders in terms of sexual and non-sexual means of transmission. However, female AIDS patients also need to be considered; despite having good sexual behavior themselves, they might still get infected by an infected husband.

Table 3
Distribution of AIDS Patients in East Java Province in 2018 by Type of Opportunistic

Type of Opportunistic Infection	Yes		No	
	n	%	n	%
TBC	485	42.62	653	57.38
Candidiasis	29	2.55	1109	97.45
Toxoplasmosis	62	5.45	1076	94.55
Herpes	227	19.95	911	80.05
Dermatitis	151	13.27	987	86.73
Encephalopathy	130	11.42	1008	88.58
Histoplasmosis	555	48.77	583	51.23
Wasting	66	5.80	1072	94.20

Age

Based on the East Java Provincial Health Office (2018), most of the AIDS patients in the sample were aged 25–49. This trend is in line with the results of current study's findings that most of the AIDS patients in the sample (713 patients; 62.65%) were adults (26–45 years old). There are vast differences between adult patients and other age groups. This is consistent with another study conducted in East Sumba, which also found that the 25–34 age group accounted for the highest proportion of HIV and AIDS patients (51.40%) (Nyoko, Hara, & Abselian, 2016). Research conducted by Amelia, Hadisaputro, Laksono, Anies, & Sofro (2016) also states that age group is a factor affecting the incidence of AIDS, with an OR of 3.94, meaning that members of the 28–44 age group were 3.94x more at risk of developing AIDS than those in the 25–27 age group.

The enduring asymptomatic period causes a delay in diagnosing HIV patients; therefore, there is a possibility that AIDS patients who have just been diagnosed between the ages of 26 and 45 first became infected during their teenage years. This is in accordance with the theory of AIDS travel. The HIV virus causes a long and chronic illness as the virus does not directly cause damage to the body at the beginning of the infection; rather, it replicates in advance to develop in the participant's body slowly. This period is called the incubation period. Some patients will experience acute HIV infection and begin to show non-typical symptoms such as fever, swallowing pain, swollen lymph nodes, rashes, diarrhea, or coughing at 3–6 weeks after infection. Asymptomatic HIV infection begins after a period of acute infection, which lasts for an average of 8–10 years (Sonklar, 2011).

Delays in diagnosis can also be affected by the low utilization of Voluntary Counseling and Testing (VCT) services. This is based on previous research showing that most HIV diagnoses originate from voluntary testing (Horino et al., 2016). The low utilization of VCT services is a result of the continued development of negative stigma among communities, as per Bancin & Panjaitan's (2017) finding that a positive response to stigma greatly influences an individual to undertake VCT.

Stigma and discrimination will hinder the prevention and diagnosis of People Living With HIV/AIDS (PLWHA) because they tend to be anxious about being discriminated against when undergoing the tests. Moreover, they are reluctant to disclose their status to partners (Widayati & Murtaqib, 2016). Stigma and discrimination against PLWHA also still occur among health workers. Based on research in Tanah Pasir Health Center, the number of discrimination cases brought against health workers by PLWHA is still high (Sofia, 2016).

This study also found case of teenaged AIDS patients, which requires special attention even though the percentage is not very high. In general, adolescent girls have better attitudes around preventing HIV and AIDS; for example, rejection of sexual relations in adolescent girls is significantly higher than in boys (Lee, Salman, & Cooksey-James, 2016). Sex education that includes information about HIV and AIDS is important for teenagers to help prevent them becoming infected by HIV and AIDS (Ningsih & Hastuti, 2018).

Occupation

Occupation refers to an activity carried out by someone regularly and continuously to earn wages. Based on the theory of the epidemiological triangle, there are three factors that affect the spread of disease: agent, vector, and environment. If someone has an occupation, this means that there is an environment where they interact routinely. Interactions carried out between individuals that occur continuously will affect human behavior (Pitoewas, 2018). An individual's work environment can also indirectly influence their behavior, leading them to become involved in risky behavior that can lead to AIDS transmission. AIDS cases can also be linked to work because people who work will have their own income. Adequate or excessive income can be a supporting factor to do anything one wants to, such as using sex workers, which is also included within risky sexual behavior (Saktina & Satriyasa, 2017).

There were three types of occupation of the AIDS patients in East Java in 2018—employees, entrepreneurs, and housewives, with the proportions of 46.08%, 18.98%, and 15.78%, respectively. These results are in line with research conducted by Saktina & Satriyasa (2017), which states that the most common occupation of AIDS patients is civil servant (43%). Employees/laborers can have a variety of high-pressure factors related to working conditions, workloads, and working hours that are set by the employing company. Working conditions that are not conducive can cause stress to employees. The dominant factor of employee work stress is working conditions. People with high stress levels will need entertainment that can be found through their sexual life, using sex workers, or drug abuse (Adnyana, Ariana, & Pertiwi, 2017). The number of AIDS patients who work as employees/laborers could also be influenced by the dominant type of work in East Java. According to 2017 statistical data, 35% of East Java's population work as employees/laborers (East Java Provincial Central Bureau of Statistics, 2017).

Self-employed was the second most common type of occupation of AIDS patients in East Java in 2018. According to Saktina & Satriyasa (2017), entrepreneurs are considered to be workers with high mobility and are more often outside their homes and in contact with many people.

Housewives ranked third in terms of the type of work carried out by AIDS patients in East Java in 2018. Housewives tend to be at home more often, but they still have the potential to be infected with the HIV virus. This might happen if

their partner/husband has been infected first. When a woman's husband has sex with an infected sex worker, it is highly likely that the man who has been infected by the sex worker will unknowingly also infect his wife. This is because the husband's condition will not yet show AIDS symptoms and thus cannot be detected. This is difficult to prevent if there is no awareness around sex workers and husbands who have risky behaviors do not routinely undergo HIV counseling and testing. In the Regulation of the Minister of Health of the Republic of Indonesia number 74 of 2014, it is recommended to retest for HIV every six months in key populations, namely IDUs, sex workers, men who have sex with other men, their sexual partners, and transgender people (Ministry of Health RI, 2014).

Risk Factors

The HIV virus can be transmitted through blood, seminal fluid, vaginal fluid, and breast milk. The spread of the virus can only occur through activities that involve contact with bodily fluids. Based on the mode of transmission, the behaviors with a risk of HIV transmission are divided into two types: sexual and non-sexual. Sexual risk factors consist of heterosexuals alternating partners in sexual intercourse, male or female sex workers, and people who have sexual intercourse that is not normal, namely anal or oral intercourse, which are most frequently performed by homosexual and bisexual people. Non-sexual risk factors include the use of narcotics by injection where the syringe is used interchangeably, and blood transfusions containing the HIV virus, as well as the normal birth process and breast milk infected with HIV. In the Minister of Health Regulation No. 21 of 2013 concerning HIV and AIDS prevention, it is explained that the key populations to be the focus of HIV and AIDS health programs consist of direct female sex workers, indirect female sex workers, transsexuals, men having sex with men, and IDUs (Ministry of Health RI, 2013).

The risk factors examined in the current study included perinatal transmission, blood transfusion, IDUs, and heterosexual, homosexual, and bisexual sexual intercourse. According to the East Java Provincial Health Office (2018), trends in AIDS risk factors in 2017 were people having heterosexual intercourse and IDUs. This trend is different from the results of current research that states that those at the highest risk for AIDS in East Java in 2018 were heterosexuals who changed partners in sexual intercourse or were unfaithful

and had more than one sexual partner (81.81%) and homosexuals (10.63%). The risk factor for the lowest proportion of respondents in the current study was blood transfusion (0.26%). This is consistent with the research of Butarbutar, Lubis, & Hiswani (2015), which reports that heterosexual and homosexual sexual behavior are the most significant risk factors for AIDS in Pematangsiantar.

According to Nandasari & Hendrati (2015), 62.90% of people do not use condoms when having sexual relations with people other than their spouses. This can increase the likelihood of someone with heterosexual behavior involving changing partners or using sex workers contracting the HIV virus. Based on Utami, Cahyo, & Indraswari (2016) research, there is a relationship HIV and AIDS in sex workers and the use of condoms and the use of condoms in the sexual activity of their clients; therefore, it is important to provide sex workers with knowledge about condom use for HIV and AIDS prevention.

Homosexual couples engaging in high-risk sexual behavior can lead to HIV transmission. Such high-risk behavior includes history of contact with a previous partner, not using condoms during sexual intercourse, high frequency of sexual risk-taking, and no self-awareness of the dangers of AIDS and sexually transmitted infections (Herlani, Riyanti, & Widjanarko, 2016). Research conducted by Sidjabat, Setyawan, Sofro, & Hadisaputro (2017) reports that the most influential factors for HIV transmission in LGBTQ communities are engaging in sexual intercourse from a young age, high-risk sexual behaviors such as not using a condom, and an individual having more than one sexual partner. Typically, homosexuals have anal or oral sex. Anal intercourse is closely related to AIDS due to the fact that the lining of the rectum (anus) is thinner and easily torn because it does not have a layer of dead cells that can provide a protective function against infection. Unlike the vagina, the anus does not have natural lubrication fluid; therefore, penetration will often tear the lining of the skin in the anus, which leads to scratches and bleeding. Anal intercourse thus causes direct contact between semen and blood. This also occurs in oral sex because the mouth and gums are parts of the body that bleed easily. In terms of transmission of the HIV virus, semen and blood are effective media for transmission by homosexual couples (Sonenklar, 2011).

In current study, the smallest proportion of cases were due to the risk factor of blood

transfusion. This may be due to strict procedures to prevent transmission of HIV through blood transfusions. Study conducted by Aminah (2015) showed that the amount of reactive HIV in 2010 through 2014 at the Blood Transfusion Unit Pembina PMI Lampung Province decreased from 0.44% down to 0.19%. This is due to the implementation of anti-HIV1/HIV2 screening procedures for donated blood which also regulates a system of refusing to allow donations from people with high-risk lifestyles and people who have sexual partners with People Living with HIV (PLHIV).

Opportunistic Infections

AIDS patients who have a late diagnosis will have an increased likelihood of experiencing opportunistic infections (OIs), whereas the OIs of people with an earlier diagnosis will be more easily prevented by the body because the immune system will be supported through therapy. The OIs examined in this study were OIs that occur frequently, including TB infections, candidiasis, toxoplasmosis, herpes simplex virus, encephalopathy, histoplasmosis, and wasting (Sonenklar, 2011).

Based on the study results, not all of the AIDS patients in this sample had experienced opportunistic infections, with 27.15% of patients not having experienced any. The highest proportion had experienced one type of OI (28.03%). Some patients had experienced more than one type of OI, but of the 1,138 patients in the sample, only 0.18% (2 people) had experienced six types of OI. The presence of patients who had not experienced OIs is a good result because it means that these patients had received early treatment to prevent infection.

In terms of the types of infection experienced by AIDS patients in East Java in 2018, the most common OIs were histoplasmosis (48.77%) and TB (42.62%). The least common infection was candidiasis (2.55%). These results differ from Saktina & Satriyasa's (2017) study in Denpasar, which reported that candidiasis and wasting syndrome were the most commonly experienced OIs (28.30% and 24.20%, respectively).

Histoplasmosis is a cause of death in AIDS patients, especially in countries with limited diagnostic testing. Diagnostic tests are very important to improve the care of AIDS patients at high risk of developing progressive disseminated histoplasmosis (Caceres, Knuth, Derado, &

Lindsley, 2019). The symptoms of histoplasmosis are similar to influenza and pneumonia, and therefore they are often only diagnosed correctly when the condition is very severe. According to Anggorowati, Sulistyaningsih, Ghozali, & Subranto (2017), disseminated histoplasmosis should be considered as a diagnosis in patients with persistent fever, weight loss, and immunodeficiency syndrome due to HIV.

There are several factors that influence the high level of opportunistic TB infections in AIDS patients, including CD4 cell count, BMI, and family history. CD4 cell counts are used as an indicator of immunity and can thus help to determine the likelihood of opportunistic infections in AIDS patients. Patients with low CD4 cell counts have a tendency to experience pulmonary TB. Family history is the most powerful factor, however; with a low level of immunity, it will be easier to contract TB from infected people. The increased incidence of TB in HIV-infected people can also be attributed to two other mechanisms, namely increased reactivation of latent TB and increased susceptibility to TB infection (Bruchfeld, Correia-Neves, & Kallenius, 2015).

CONCLUSION

This study identified a higher proportion of male than female AIDS patients in East Java in 2018. The highest proportions of AIDS patients in the sample were in the adult age group, worked as employees/laborers, and had sexual risk factors (both heterosexual and homosexual). Not all patients experienced opportunistic infections, but most frequently, one type of OI had occurred. The most commonly experienced OIs were histoplasmosis and TB.

CONFLICT OF INTEREST

The authors state that there is no conflict of interest in this study.

AUTHOR CONTRIBUTION

ABFC provided data, ideas, and an understanding of AIDS surveillance programs at the provincial health department level. GSP developed ideas and processed and analyzed the data. All authors discussed the results and contributed to the final draft.

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