



The Occurrence of Tuberculosis Infection among Newly HIV Diagnosed Patient in Indonesia

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Abstract

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BACKGROUND: Human immunodeficiency virus (HIV) is a big threat to Indonesia and the rest of the world. People with HIV are more prone to opportunistic diseases like tuberculosis (TB) because HIV damages the immune system.

AIM: This study aims to determine the prevalence and risk factors (age and gender) that contribute to pulmonary TB among HIV/AIDS patients admitted to Genteng Hospital Banyuwangi.

METHODS: This research uses the Observational Analytical, Cross-Sectional method. We collected data from 372 new diagnosed HIV patients between 2019 and 2021. HIV diagnosis was obtained with a rapid test method. At the same time, a pulmonary TB diagnosis was obtained with Xpert MTB/RIF.

RESULTS: We found that 372 individuals were HIV positive, and 63 patients among them were also positive for TB (16.93%). The majority of individuals were male (53.22%), in the age group of adults (26–45 years old) (62.1%). While HIV-TB patients were found among those in adult age group (16.13%), all patients positive with HIV-TB still susceptible to rifampicin treatment. The prevalence of TB among HIV patients did not differ significantly by gender or age.

CONCLUSION: We found TB co-infection in newly diagnosed HIV patients. Individuals at risk of HIV infection should be screened early to minimize co-infection with other diseases that can aggravate their condition. As a result, the severity and death rate of HIV patients can be reduced in the long run.

Introduction

The Human Immunodeficiency Virus (HIV) is currently a huge threat to Indonesia and other countries around the world. HIV infection can lead to a more serious condition known as Acquired Immune Deficiency Syndrome (AIDS). In 2017, an estimated 36.9 million people worldwide were infected with HIV and among those HIV patients; there were 1.8 million new infections. Between 2005 and March 2019, 338,363 persons in Indonesia were diagnosed with HIV. AIDS cases in Indonesia have already reached 114,065 persons as of December 2018. From January to March 2019, HIV transmission was documented in 11,081 people, while AIDS transmission was reported in 1,536 people [1].

Despite the fact that the number of HIV cases is declining globally, many people are still at risk of infection, particularly among communities with a high risk of infection, also known as the HIV key population. The key population of HIV determines the success of HIV prevention and treatment, this group must be actively involved in HIV/AIDS prevention for themselves and

others [2]. The Ministry of Health has launched a strategy to limit HIV transmission among important populations by educating them on ways to lower new HIV transmission rates, HIV/AIDS mortality rates, negative stigma, and discrimination against HIV-positive persons [3], [4].

Reduced immunity characterizes the ultimate stage of HIV infection, which leads to AIDS. Due to opportunistic infections, a person living with HIV/AIDS begins to show symptoms. Microorganisms that normally do not cause major sickness in healthy persons can produce this opportunistic infection. However, for people living with HIV (PLHIV), it may put their lives in jeopardy. Tuberculosis (TB) infection is one example of opportunistic infection that can lead to death in HIV patients [5]. Mortality related with TB is greater than HIV infection although HIV and TB work hand in hand to suppress the immunity of the patient leading to shorten lifespan if not treated [6].

Indonesia is recognized for having a high prevalence of TB. Indonesia is currently ranked second in the world for the number of people living with TB. In 2017, 420,994 instances of TB were reported, with 1.85% of them infected with HIV [7]. TB is the second

most common opportunistic illness in Indonesia, and it is also the leading cause of death among HIV patients [8]. Early detection of TB infection in HIV patients, on the other hand, can aid with efficient treatment and thereby reduce the mortality rate in HIV patients due to co-infection with TB.

West Java and East Java Provinces in Indonesia have a high incidence of TB cases. In 2018, the number of new TB cases in East Java Province was 20.535 [7]. The frequency of TB among HIV-positive individuals in East Java Province, one of which is Banyuwangi, is of considerable interest to us. Patients were reluctant to visit health care centers for a variety of reasons, and instead decided to wait for opportunistic illnesses to develop. One explanation is because they are terrified of being stigmatized by their workplace. As a result, they sought to conceal their HIV infection [9].

Methods

This study conducted with cross sectional design at RSUD Genteng Banyuwangi between January 2019 and December 2021. There were 309 patients HIV positive and 63 patients HIV-TB positive. All patients were newly diagnosed with HIV. Inclusion criteria used in this study were patients with all gender and all age, HIV-positive, HIV, and TB positif. TB diagnosis was performed with Xpert MTB/RIF. While, HIV diagnosed with three rapid test method to detect HIV antibody.

Xpert MTB/RIF assay

The Xpert MTB/RIF assay was conducted as it is introduced in the previous studies [10]. Sample reagent was added at a 3:1 ratio to the specimen (sputum) container. Then it was incubated for 15 min at room temperature, stirred gently twice. The testing cartridge was then filled with 2 mL of these combinations. After sealing the lid on the cartridge, place it in the Xpert MTB/Rif assay equipment. Sample reagent was added at a 3:1 ratio to the specimen (sputum) container. Then it was incubated for 15 min at room temperature, stirred gently twice. The testing cartridge was then filled with 2 mL of these combinations. After sealing the lid on the cartridge, place it in the Xpert MTB/Rif assay equipment.

Statistical analysis

Age and gender were presented with n (%). Statistical analysis was calculated with Microsoft Excel 2010 for Mac version. Correlation analysis was performed with the Chi-square test with $p < 0.05$.

Results

We collected data from 372 newly diagnosed HIV patients. About 198 patients (53.2%) were male while the rest is female (174 patients, 46.7%). When we distributed according to their age, our result showed that in the age of 26–45 years old, we could observe high prevalence of HIV positive (82.79%) as well as HIV-TB coinfection (15.05%). Clinical information of the participants is presented in Table 1.

Table 1: Characteristic of HIV patients and HIV-TB patients

Characteristic	n	HIV patients (%)	HIV-TB patients (%)	p-value*
Sex				
Female	174	150 (86.21)	24 (13.79)	0.12
Male	198	159 (80.3)	39 (19.7)	
Age (years)				
< 12	11	10 (90.9)	1 (9.1)	0.65
12–25	60	48 (80)	12 (20)	
26–45	231	195 (84.42)	36 (15.58)	
45–65	70	56 (80)	14 (20)	

*: significant value $P < 0.05$.

Among those newly diagnosed HIV patients, 63 patients (16.93%) were also infected TB. Using GeneXpert MTB/RIF, all samples were detected sensitive to rifampicin. Susceptibility to TB infection among newly diagnosed HIV patient did not correlate with sex ($p = 0.12$) or age ($p = 0.65$) (Table 1). Following medication for those HIV-TB coinfecting patients, we found that no resistant to rifampicin were detected. Thus, it can be concluded that HIV treatment and TB treatment do not affect each other.

Discussion

The appearance of TB infection among newly diagnosed HIV positive patient were alarming since HIV-TB coinfection can lead to death. Our result showed that around 16.93% newly diagnosed HIV positive patient also infected with TB. This result also showed in previous study in Gresik, other city of East Java, Indonesia [11]. These result also in accordance with other results in other developing countries showing under than 20% HIV-TB coinfection cases [12], [13]. While, those HIV-TB cases in developed countries showed $< 10\%$ [14]. Thus, these results confirm the necessity to conduct screening for early detection of HIV and HIV-TB co-infection.

Our study found that there is no correlation between gender and susceptibility of HIV-TB coinfection. These results also supported previous studies, which showed that the reactions of men and women to TB may different but the effects of TB treatment remain the same [15]. As a result, gender differences cannot lead to differences in the prevalence of TB among HIV-positive people. To reach a definitive conclusion, this subject should be addressed in a future study with more HIV-TB data (covering a larger area than Banyuwangi).

The majority of HIV positive cases were adults, according to our findings (26–45 years old). Among this age group, the prevalence of TB in HIV patients was likewise high (15.05% with median age of 33 years old). This trend showed that adult age is prone to HIV infection. In terms of HIV infection alone in Indonesia, the highest prevalence is found among productive age group (20–49 years old) through the years [16]. The previous study also found that of HIV-TB infection increases with age [17]. However, other study showed using multivariate analysis that age only, will not increase the chance of TB infection among HIV patients but several other factor are likely will give statistically significant differences such as low CD4 count [18]. But unfortunately, since the CD4 cell count test is still not a mandatory test for diagnosing HIV and the price is a little bit higher, Genteng hospital does not perform this test. The fact that the majority of HIV patients are in their productive years has little bearing on the prevalence of TB coinfection [19]. Other studies, on the other hand, suggested that this phenomenon is linked to socioeconomic concerns, individual and family responsibility [20].

Finally, our findings demonstrated the importance of screening HIV-positive individuals, particularly in locations where the risk of HIV transmission is high (among a key population of HIV). We can lower the occurrence of opportunistic diseases by detecting HIV early. The Ministry of Health has made it essential to educate people about HIV infection and transmission in order to decrease negative stigma and improve the quality of life for HIV-positive people. However, based on our observations, many are still hesitant to evaluate their HIV infection risk, particularly those who reside in close proximity to a high-risk community.

Conclusion

From January 2019 to December 2021, the prevalence of TB among newly diagnosed HIV positive patients admitted to Genteng Hospital was 16.93%. In this study, we found no significant differences in gender, age that makes HIV patients more susceptible to TB infection.

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