

OAJMS paper

by Dwi Wahyu Indriati

Submission date: 15-Aug-2023 02:54PM (UTC+0800)

Submission ID: 2146106723

File name: Diagnosed_Patient_in_Indonesia-revised_version10052022_Ani.docx (49.71K)

Word count: 2299

Character count: 13080

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

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 tuberculosis 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 to 2021. HIV diagnosis was obtained with a rapid test method. At the same time, a pulmonary tuberculosis 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 tuberculosis 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 through 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 determine 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 infection are 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].

1 Indonesia is recognized for having a high prevalence of tuberculosis. Indonesia is currently
2 ranked second in the world for the number of people living with tuberculosis. In 2017, 420.994
3 instances of tuberculosis were reported, with 1.85 percent of them infected with HIV [7].
4 Tuberculosis is the second most common opportunistic illness in Indonesia, and it is also the
5 leading cause of death among HIV patients [8]. Early detection of tuberculosis infection in HIV
6 patients, on the other hand, can aid with efficient treatment and thereby reduce the mortality rate
7 in HIV patients due to co-infection with TB.

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

15

16 **Methods**

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

23 **Xpert MTB/RIF assay**

24 The Xpert MTB/RIF assay were conducted as it is introduced in previous studies [10].
25 Sample reagent was added at a 3:1 ratio to the specimen (sputum) container. Then it was incubated
26 for 15 minutes at room temperature, stirred gently twice. The testing cartridge was then filled with
27 2 mL of these combinations. After sealing the lid on the cartridge, place it in the Xpert MTB/Riff
28 assay equipment. Sample reagent was added at a 3:1 ratio to the specimen (sputum) container.
29 Then it was incubated for 15 minutes at room temperature, stirred gently twice. The testing
30 cartridge was then filled with 2 mL of these combinations. After sealing the lid on the cartridge,
31 place it in the Xpert MTB/Riff assay equipment.

32 **Statistical analysis**

33 Age, gender was presented with n (%). Statistical analysis was calculated with Microsoft
34 Excel 2010 for Mac version. Correlation analysis was performed with the Chi-Square test with p
35 <0.05.

36 **Results**

37 We collected data from 372 newly diagnosed HIV patients. About 198 patients (53.2%)
38 were male while the rest is female (174 patients, 46.7%). When we distributed according to their
39 age, our result showed that in the age of 26-45 years old, we could observe high prevalence of HIV

1 positive (82.79%) as well as HIV-TB coinfection (15.05%). Clinical information of the
2 participants is presented in Table 1.

3 **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)	

4

5 *: significant value $p < 0.05$

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

12 Discussion

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

20 Our study found that there is no correlation between gender and susceptibility of HIV-TB
21 coinfection. These results also supported previous studies, which showed that the reactions of men
22 and women to tuberculosis may different but the effects of tuberculosis treatment remain the same
23 [15]. As a result, gender differences cannot lead to differences in the prevalence of tuberculosis
24 among HIV-positive people. To reach a definitive conclusion, this subject should be addressed in
25 a future study with more HIV-TB data (covering a larger area than Banyuwangi).

26 The majority of HIV positive cases were adults, according to our findings (26-45 years
27 old). Among this age group, the prevalence of tuberculosis in HIV patients was likewise high
28 (15.05 % with median age of 33 years old). This trend showed that adult age is prone to HIV
29 infection. In terms of HIV infection alone in Indonesia, the highest prevalence are found among
30 productive age group (20-49 years old) through the years [16]. Previous study also found that of
31 HIV-TB infection increases with age [17]. But other study showed using multivariate analysis that
32 age only, will not increase the chance of TB infection among HIV patients but several other factor

1 are likely will give statistically significant differences such as low CD4 count [18]. But
2 unfortunately, since the CD4 cell count test is still not a mandatory test for diagnosing HIV and
3 the price is a little bit higher, Genteng hospital does not perform this test. The fact that the majority
4 of HIV patients are in their productive years has little bearing on the prevalence of TB coinfection
5 [19]. Other studies, on the other hand, suggested that this phenomenon is linked to socioeconomic
6 concerns, individual and family responsibility [20].

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

14 **Conclusion**

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

18 **References**

- 19 1. Kementerian Kesehatan Republik Indonesia. Laporan Situasi Perkembangan HIV/AIDS
20 dan PIMS di Indonesia Tahun 2018. Direktorat Jenderal Pengendali Penyakit dan
21 Penyehatan Lingkungan. 2018;1–30.
- 22 2. WHO. Policy Brief: Consolidated guidelines on HIV prevention, diagnosis, treatment and
23 care for key populations, 2016 update. Who [Internet]. 2018;8. Available from:
24 <http://www.who.int/hiv/pub/toolkits/keypopulations-2016-update/en/>
- 25 3. Kementerian Kesehatan RI. Pedoman Manajemen Program Pencegahan Penularan HIV dan
26 Sifilis dari Ibu Ke Anak. Jakarta: Kementerian Kesehatan RI; 2015. 30 p.
- 27 4. Kementerian Kesehatan RI. Peraturan Kementerian Kesehatan Republik Indonesia No 74
28 Tahun 2014. Vol. 85. 2014.
- 29 5. Swaminathan S, Nagendran G. HIV and tuberculosis in India. *J Biosci.* 2008
30 Nov;33(4):527–37.
- 31 6. Tesfaye B, Alebel A, Gebrie A, Zegeye A, Tesema C, Kassie B. The twin epidemics:
32 Prevalence of TB/HIV coinfection and its associated factors in Ethiopia; A systematic
33 review and meta-analysis. *PLoS One.* 2018;13(10):1–18.
- 34 7. Republic of Indonesia M of H. InfoDatin Tuberculosis [Internet]. Ministry of Health
35 Republic of Indonesia. 2018. 1 p. Available from:
36 [https://www.depkes.go.id/article/view/18030500005/waspadai-peningkatan-penyakit-](https://www.depkes.go.id/article/view/18030500005/waspadai-peningkatan-penyakit-menular.html%0Ahttp://www.depkes.go.id/article/view/17070700004/program-indonesia-sehat-dengan-pendekatan-keluarga.html)
37 [menular.html%0Ahttp://www.depkes.go.id/article/view/17070700004/program-indonesia-](http://www.depkes.go.id/article/view/17070700004/program-indonesia-sehat-dengan-pendekatan-keluarga.html)
38 [sehat-dengan-pendekatan-keluarga.html](http://www.depkes.go.id/article/view/17070700004/program-indonesia-sehat-dengan-pendekatan-keluarga.html)
- 39 8. Kusumaadhi ZM, Farhanah N, Udji Sofro MA. Risk Factors for Mortality among
40 HIV/AIDS Patients. *Diponegoro Int Med J.* 2021;2(1):20–19.
- 41 9. Anggina Y, Lestari Y, Zairil Z. Analisis Faktor yang Mempengaruhi Penanggulangan
42 HIV/AIDS di Wilayah Kerja Dinas Kesehatan Kabupaten Padang Pariaman Tahun 2018. *J*
43 *Kesehat Andalas.* 2019;8(2):385.
- 44 10. Lawn SD, Nicol MP. Xpert® MTB/RIF assay: development, evaluation and

- 1 implementation of a new rapid molecular diagnostic for tuberculosis and rifampicin
2 resistance. *Future Microbiol.* 2011 Sep;6(9):1067–82.
- 3 11. Fatimatuzzuhro, Sundari AS, Indriati DW. The prevalence of pulmonary tuberculosis
4 among newly diagnosed HIV/AIDS individuals admitted in Gresik, Indonesia. *Malaysian*
5 *J Med Heal Sci.* 2020;16(5):4–8.
- 6 12. Kapadiya DJ, Dave P V, Vadera B, Patel PG, Chawla S, Saxena D. Assessment of
7 Tuberculosis Prevalence in Newly Diagnosed Human Immunodeficiency Virus-Infected
8 Adults Attending Care and Treatment Center in Gujarat, India. *Indian J community Med*
9 *Off Publ Indian Assoc Prev Soc Med.* 2018;43(3):185–9.
- 10 13. Mbu ET, Sauter F, Zoufaly A, Bronsvort BM de C, Morgan KL, Noeske J, et al.
11 Tuberculosis in people newly diagnosed with HIV at a large HIV care and treatment
12 center in Northwest Cameroon: Burden, comparative screening and diagnostic yields, and
13 patient outcomes. *PLoS One* [Internet]. 2018 Jun 26;13(6):e0199634. Available from:
14 <https://doi.org/10.1371/journal.pone.0199634>
- 15 14. Goletti D, Navarra A, Petruccioli E, Cimaglia C, Compagno M, Cuzzi G, et al. Latent
16 tuberculosis infection screening in persons newly-diagnosed with HIV infection in Italy:
17 A multicentre study promoted by the Italian Society of Infectious and Tropical Diseases.
18 *Int J Infect Dis* [Internet]. 2020;92:62–8. Available from:
19 <https://doi.org/10.1016/j.ijid.2019.12.031>
- 20 15. Nsubuga P, Johnson JL, Okwera A, Mugerwa RD, Ellner JJ, Whalen CC. Gender and
21 HIV-associated pulmonary tuberculosis: Presentation and outcome at one year after
22 beginning antituberculosis treatment in Uganda. *BMC Pulm Med.* 2002;2:1–7.
- 23 16. Republic of Indonesia M of H. Infodatin HIV AIDS [Internet]. Ministry of Health
24 Republic of Indonesia. 2020. Available from:
25 <https://pusdatin.kemkes.go.id/resources/download/pusdatin/infodatin/infodatin-2020->
26 [HIV.pdf](https://pusdatin.kemkes.go.id/resources/download/pusdatin/infodatin/infodatin-2020-HIV.pdf)
- 27 17. Awoyemi OB, Ige OM, Onadeko BO. Prevalence of active pulmonary tuberculosis in
28 human immunodeficiency virus seropositive adult patients in University College
29 Hospital, Ibadan, Nigeria. *Afr J Med Med Sci.* 2002 Dec;31(4):329–32.
- 30 18. Molaeipoor L, Poorolajal J, Mohraz M, Esmailnasab N. Predictors of Tuberculosis and
31 Human Immunodeficiency Virus Co-infection: A Case-Control Study. *Epidemiol Health.*
32 2014;e2014024.
- 33 19. Kibret KT, Yalew AW, Belaineh BG, Asres MM. Determinant Factors Associated with
34 Occurrence of Tuberculosis among Adult People Living with HIV after Antiretroviral
35 Treatment Initiation in Addis Ababa, Ethiopia: A Case Control Study. *PLoS One.*
36 2013;8(5):23–7.
- 37 20. de Castro Castrighini C, Reis RK, de Souza Neves LA, Galvão MTG, Gir E.
38 Epidemiological profile of HIV/tuberculosis co-infection in a city in the state of São
39 Paulo, Brazil. *J Antivirals Antiretrovir.* 2013;5(5):119–22.
- 40
41
42
43

OAJMS paper

ORIGINALITY REPORT

10%

SIMILARITY INDEX

8%

INTERNET SOURCES

5%

PUBLICATIONS

1%

STUDENT PAPERS

PRIMARY SOURCES

1	www.msjonline.org Internet Source	1%
2	www.science.gov Internet Source	1%
3	journal.i3l.ac.id Internet Source	1%
4	journals.plos.org Internet Source	1%
5	www.pearltrees.com Internet Source	1%
6	mafiadoc.com Internet Source	1%
7	Edi Purwanto, Mayang Sari, Aini Alifatin, Risa Herlianita. "Social Support and Quality of Life Patients with Acquired Immune Deficiency Syndrome", KnE Medicine, 2023 Publication	1%
8	jbiomedsci.biomedcentral.com Internet Source	<1%

9

Putu Satyakumara Upadhana, Haikal Hamas Putra Iqra, I Gusti Agung Ayu Chintya Cahyarini, I Ketut Agus Somia et al.

"Correlation Between Clinical Manifestation and Radiological Findings In Pulmonary Tuberculosis-Human Immunodeficiency Virus Coinfection Patients In Sanglah Hospital, Bali, Indonesia", Current HIV Research, 2020

Publication

<1 %

10

[i-scholar.in](https://www.i-scholar.in)

Internet Source

<1 %

11

storage.googleapis.com

Internet Source

<1 %

12

www.dovepress.com

Internet Source

<1 %

13

www.japi.org

Internet Source

<1 %

14

Amare Getu, Haileab Fekadu Wolde, Yaregal Animut, Anteneh Ayelign Kibret. "Incidence and predictors of Tuberculosis among patients enrolled in Anti-Retroviral Therapy after universal test and treat program, Addis Ababa, Ethiopia. A retrospective follow -up study", PLOS ONE, 2022

Publication

<1 %

15

Li Li, Zulipikaer Abudureheman, XueMei Zhong, Hui Gong et al. "Clinical symptoms and immune injury reflected by low CD4/CD8 ratio should increase the suspicion of HIV coinfection with tuberculosis", Heliyon, 2023

Publication

<1 %

16

Diana Gladys Kolioghu Tcheumeni, Henry Dilonga Meriki, Denise Sam, Desmond Akumtoh Nkimbeng et al. "Predictors of advanced HIV disease in patients on antiretroviral therapy at the Buea Regional Hospital and co-infection rates of Mycobacterium spp. and Cryptococcus spp", Research Square Platform LLC, 2022

Publication

<1 %

Exclude quotes On

Exclude matches < 5 words

Exclude bibliography On

OAJMS paper

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

/0

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5
