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Prevalence of ATD (Anti Tuberculosis Drugs) Hypersensitivity Reactions in HIV Patients Period 2021 at Sanglah Central General Hospital

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Abstract
Introduction: *Tuberculosis is a disease caused by Mycobacterium tuberculosis. Pulmonary tuberculosis (pulmonary TB) is tuberculosis that attacks the lung tissue (parenchyma) excluding the pleura (lung membrane) and glands in the hilum, which has a wide spectrum of clinical manifestations ranging from asymptomatic infection to severe respiratory symptoms and even death. Tuberculosis an important cause of death among patients infected with HIV.* ***Method:*** *This study is a descriptive study with cross-sectional approach. Sampling with consecutive sampling. This sampling was done from January 2021 until December 2021. Analysis done with SPSS application.* ***Results and Discussion:*** *From 25 patients with HIV and hypersensitivity TB drugs, we found 72% was male vs 28% was female, 80% patients with Pre HAART vs 20% with on HAART. There is show has not associate with the severity of HIV.* ***Conclusion:*** *From this study, we can learn the hypersensitivity patients do not associate with severity of HIV. However, this study has a lot of weakness from methods, analysis and sample similarity. We hope that another study can be better method than this study.*

Keywords: HIV; Tuberculosis; Hypersensitivity;

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Introduction

HIV (Human Immunodeficiency Virus) is a virus that damages the immune system by infecting and destroying CD4 cells. The global incidence rate to date has been reported to be 450 million people with a mortality of 10.3% and the clinical spectrum of HIV from mild to critical degrees with manifestations of upper respiratory tract disease to respiratory failure and even death (Garcia-Rodriguez et al., 2011; Indonesia, 2011). The impact of TB on HIV is that when TB germs (Mycobacterium tuberculosis) attack patients with HIV, the CD4 count decreases which causes the ability of the People living with HIV/AIDS immune system to attack the HIV virus to be reduced, this is because the immune system must also work to fight TB infection. Meanwhile, the impact of HIV on TB causes infection to become more active and faster. If a TB patient has been infected with HIV, TB treatment must be carried out immediately, regardless of status as an HIV patient by providing Anti Tuberculosis Drugs, namely Isoniazid (INH or H), Pyrazinamide (Z), Ethambutol (E), Rifampicin (R) and Streptomycin (S). TB patients with HIV have a higher risk of hospital admission and death compared to subjects who do not have TB (Rai & Khan, 2018). Recent evidence suggests that HIV is also capable of causing direct damage to various organs that can worsen the condition (Ramirez-Lapausa et al., 2015).

Method

This research is descriptive research with the cross-sectional method. Sampling by consecutive sampling method consisted of 25 HIV patients with suspected ATD (anti tuberculosis drugs) hypersensitivity reactions. Samples were patients who were hospitalized at Sanglah Hospital Denpasar from January 2021 to December 2021. Data were obtained through interviews and laboratory examinations of complete blood and CD4 cells.

The collected data were processed using the SPSS 25 program. The statistical analysis used was descriptive for univariate analysis to examine the prevalence of ATD (anti tuberculosis drugs) hypersensitivity reactions in HIV patients.

Result and Discussion

This study involved 25 subjects consisting of 18 (72%) men and 7 (28%) women. On HAART there were 20 patients (80%) on HIV and 5 patients on HAART (20%). Of the 25 patients, 16 patients (64%) had CD4 < 20 values and CD4 > 20 in 9 patients (36%).

Table 1

Sample Characteristics

Variable	Frequency (N= 25)	Percentage (%)
Gender		
Male	18	72
Female	7	28
CD4		
< 20	16	64
> 20	9	36
HIV		
Pre HAART	20	80
On HAART	5	20

Table 2

Prevalence of ATD (anti tuberculosis drugs) hypersensitivity reactions in HIV patients

Hypersensitive ATD (anti tuberculosis drugs)	HIV	
	Pre HAART (N=20)	**On HAART (N=5)**
Isoniazid (INH or H)	0	0
Pyrazinamide (Z)	0	0
Ethambutol (E)	2	0
Rifampicin (R)	6	2
Streptomycin (S)	0	0

Table 3

Prevalence of ATD (anti tuberculosis drugs) hypersensitivity reactions based on CD4 values

Hypersensitivities ATD (anti tuberculosis drugs)	CD4	
	< 20 (N=16)	**> 20 (N=9)**
Isoniazid (INH or H)	0	0
Pyrazinamide (Z)	0	0
Ethambutol (E)	2	0
Rifampicin (R)	5	3
Streptomycin (S)	0	0

Table 2 shows that Rifampicin therapy is more dominant in hypersensitivity reactions as many as 6 subjects on HIV Pre HAART and 2 subjects on HIV on HAART compared to ethambutol, isoniazid, pyrazinamide and streptococci. variable dependent is ATD (anti tuberculosis drugs) Hypersensitivity and the independent variable consists of HIV Pre HAART and HIV On HAART and table 3 shows that Rifampicin therapy is more dominant in hypersensitivity reactions as many as 5 subjects on CD 4 <20 and 3 subjects on CD 4 > 20 compared to Ethambutol, Isoniazid, pyrazinamide and

streptomycin. Variable dependent is ATD (anti tuberculosis drugs) Hypersensitivity and the independent variable consists of CD4<20 and CD4>20.

Discussion

Recent studies have shown that Tuberculosis is one of the most common comorbid diseases found in HIV patients, with prevalence ranging from 5.3% to 58.0% (Glaziou et al., 2018). Tuberculosis has been associated with increased mortality in previous viral epidemics, such as the SARS-CoV-1 and the Middle East Respiratory Syndrome Coronavirus (MERS CoV) outbreaks. Similar results were also reported in the COVID-19 pandemic, with several studies showing that tuberculosis is a risk factor in the worsening of HIV prognosis (Colson et al., 2014). A meta-analysis article showed that tuberculosis was associated with a more than doubled risk of ICU admission compared with HIV patients without comorbid TB (Ray et al., 2018).

Emerging data on the association between HIV infection and TB have shown that patients diagnosed with TB are as likely to be infected with HIV as the general population. However, TB patients had a higher risk of serious complications caused by HIV, and the risk was similar for both Pre-HAART and On-HAART (Kemenkes, 2019). Many studies have shown that CD4 cells can influence cellular immune responses, increasing infection-related morbidity and mortality. Low CD4 cell counts are associated with the risk of complications in HIV patients (Colson et al., 2014).

TB patients had an 85% increased chance of severe or critically ill HIV compared to those without TB (Kemenkes, 2019). An association study showed that patients with TB had a 2.26-fold risk of developing severe HIV. This is supported by a meta-analysis of 1936 HIV patients worldwide, which showed a significant correlation between HIV severity and the presence of TB (OR 2.67, 95% KI 1.91–3.74, $p < 0.01$) (Abaynew et al., 2011).

From this study, it was found that out of 25 diabetic patients, 72% were male and 28% were female. A common characteristic found in HIV patients with TB is that they are male. Early reports of HIV were found to occur mostly in people with underlying factors, one of which was TB at an older age and male sex (Abaynew et al., 2011). Similarly, in a study conducted in 204 UK hospitals in hospitalized patients with HIV, it was reported that the mean age of patients was 33 years (24 - 48 years), 60% of whom were men, 40% were women (Ray et al., 2018).

In this study, 64% of patients had a CD4 count <20 and 36% had a CD4>20. According to L. Rastica's 2019 study, all studies evaluated the role of CD4 in progression, prognosis, and mortality in HIV patients with TB. Most of the studies reported showed an association between decreased CD4 cell count and worsening HIV disease prognosis as assessed by the patient's clinical deterioration, namely lower oxygen saturation. A low CD4 cell count has been shown to be closely associated with a poorer HIV prognosis in terms of clinical development and mortality. In this study, there was no significant relationship between ATD (anti tuberculosis drugs) hypersensitivity in HIV patients and CD4 levels in patients.

Conclusion

People with HIV had a significantly higher risk of developing TB than people without TB. In TB patients there is a risk of ATD (anti tuberculosis drugs) hypersensitivity reaction which must be proven by ATD (anti tuberculosis drugs) desensitization examination. Low CD4 levels were not associated with increased mortality in anti-HIV hypersensitivity patients with HIV.

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