EDELWEISS PUBLICATIONS
OPEN ACCESS

Volume 1 Issue 1 | PDF 107 | Pages 4

Edelweiss Journal of AIDS

Research Article

Treatment of Cotrimoxazole Prevention Significantly Improved CD4 in HIV/AIDS Patients in Sulianti Saroso Hospital, Jakarta, Indonesia

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Citation: Windiyaningsih C, Pertiwi I and Rusli A. Treatment of cotrimoxazole prevention significantly improved CD4 in HIV/AIDS patients in sulianti saroso hospital, Jakarta, Indonesia (2019) Edelweiss J AIDS 1: 17-20.

Received: Oct 28, 2019

Accepted: Nov 04, 2019

Published: Nov 11, 2019

Abstract

Background: World Health Organisation (WHO) estimates at year 2014 there were 9.6 million peoples worldwide suffering from Tuberculosis (TB). One third of the 37 million peoples living with HIV worldwide were infected by latent TB, in which people with latent TB were at risk 26 times (24-28) to become patients with active TB. In September 2014, the cumulative cases of Human Immuno Defieciency Virus (HIV) in Indonesia were 150,296 cases with the number of people living with HIV who were Already Received Antiretroviral Treatment (ARVT) as many as 45,631 peoples, and TB was the most opportunistic infection in people living with HIV in Hospital Infection Prof Dr. Sulianti Saroso in year 2013 until year 2016, despite the number of people living of HIVAIDS+TB was decreased (year 2013 amount 29.5% 2016 amount 22% Research purpose was to determine the determinant influence of HIVAIDS+TBC.

Research method: This research was a quantitative with case control study using secondary data in medical record. The study population in this study was all patients of TB-HIV Co-Infection at Infectious Hospital Prof Dr. Sulianti Saroso, Jakarta at 2013-2016. The sample in the study was calculated using Lemeshow formula amount 160 for cases and 160 controls taken by the random sampling technique. Data analysis was done by univariate, bivariate and multivariate with multiple logistic regressions.

Result: Analysis biavariate correlation the variables significant such as Comorbidity p value 0.002, OR 0.186, 95% CI 0.056-0.617; CD4 p value 0.001, OR 0.158, 95%CI 0.080-0.316 and HIV+TB and HIV p value 0.001, OR 0.323, 95% CI 0.183-0.569. Multivariate

Conclusions: Final result cotrimoxazole corelation with improving CD4 and prevention for co morbidity.

Keywords: Access, Cotrimoxazole, Comorbid, CD4 cell, Weight loss, HIVAIDS+TBC.

Abbreviations: WHO-World Health Organisation, HIV-Human Immuno Defieciency Virus, ARVT-Antiretroviral Treatment, AIDS-Acquired Immunodeficiency Syndrome, TB-Tuberculosis, CPT-Cotrimoxazol Prevention Treatment, PLWHA-People Living with HIV/AIDS, OAT-Opioid Agonist Treatment, IO-Opportunistic Infections, PCP-Pneumonia Pneumocystis, PCT-Patent Cooperation Treaty, DUE-Drug Use Evaluation.

Introduction

HIV and TB co-infection were big challenge for both diseases control program. HIV/AIDS was disease that cause decrease pattern immunity which encouraged HIV patients to expose with another infections. Tuberculosis was opportunistic infection at People Living with HIV/AIDS although PLWHA. ARVT and most occurred co-infection at PLWHA [1,2]. Co-Infection TB HIV from patients with positive HIV test result in 41 countries with HIV and TB high rated at 2013 in 18-20%.

Highest rate was Africa Region at 41%, meanwhile in another region like America at 14%, Europe 8%, South East Asia at 6%, also Mediterranean and West Pacific less than 35. From 41 countries with high rate TB+HIV patients, Indonesia had lowest rate of TB patients with HIV test result at 2%, meanwhile high rate in Rwanda with 98% [1].

Third of 37 million PLWHA infected with latent TB, PLWHA with latent TB had 26 items risk (24-28) to become TB active patients [2]. In Infection disease hospital Prof. Dr Sulianti saroso (RSPISS), PLWHA data with TB Co-infection get ARV therapy at 2010, HIV/AIDS patients 236 with TB patients 108 (45,76%) patients; at 2011, HIV/AIDS patients 173 with TB 60 (34,68%) patients; at 2012, HIV/AIDS patients 322 with TB 104 (32,29%) patients; at 2013, HIV/AIDs patients 407 with TB 120 (29,48%) patients; at 2014, HIV/AIDS patients 313 with TB 78 (24,92%); at 2015, HIV/AIDS patients 308 with TB 85 (27,60%) patients; at 2016, HIV/AIDs patients 336 with TB 74 (22,02%) patients. (Working Group HIV routine report, Rusli Adria, 2016) [3]. From 2010 until 2016 the number of patients HIV/AIDS+TB had decreased significant.

Cotrimoxazole Prevention Treatment (CPT)

Meanwhile HIV/AIDS patients with TB give CPT. Drug that used in treatment increased so there were changes in ARV guideline. All TB patients with HIV infection should evaluated to determine the needs of ARV treatment during Opioid Agonist Treatment (OAT) period. Suitable plan for patient that indicated with this disease was to access ARV drug. OAT treatment can't be halted. TB and HIV infection patient should give with Cotrimoxazole as prevention to other infections (Standard 15 ISTC). At health center that have CD4 examination facility, CPT recommended for patient with CD4 value<200 cell/mm^3 patient HIV without TB meanwhile for patient HIV with TB, CPT given without seeing CD4 value. According observation data, PPK at HIV patient reduce mortality 50%. Several researches had proved CPT effect in reducing mortality and morbidity HIV patients. It related with reduction of opportunistic infection incidents. Several Opportunistic Infections (IO) at HIV/AIDS patients can be prevented with prophylaxis treatment. There were two types of prophylaxis treatment, primary prophylaxis and secondary prophylaxis.

- Primary prophylaxis was prevention treatment to prevent new infection that never happened before.
- Secondary prophylaxis was prevention treatment to prevent infection that happened before.

Opportunistic Disease whose Risk can be Prevented with CPT:

- Pneumonia Pneumocystis (PCP) previously called Pneumocystis carinii pneumonia now called Pneumonia *Pneumocystis Jirovecii*
- Toxoplasmosis brain abscess
- Pneumonia
- Isospora belli
- *Salmonella species*
- Malaria

Objective

General Objective

To prove CD4 before and after Give CPT improve significant in HIV/AIDS Patients.

Specific Objective

- To explain the distribution and frequency of age, gender, education, occupation, married status, comorbid, HIVTB, bodyweight, CD4 before treatment, Access to Health Services.
- To prove the correlation between CPT with age, gender, education, occupation, married status, comorbid, HIV TB, Body Weight. CD4 before treatment, Access to Health Services.
- To know the factor dominant correlation with CPT.

Method

Study quantitative, study intervention CPT and no CPT, number of sample 320 HIV/AIDS, independent variables: HIVAIDS+TB (all cases 160), 160 HIVAIDS (control by random sample); age, gender, education, occupation, married status, body weight. The data was collected by medical record, analysis distribution and frequency, cross tabulation, multiple logistic regression, and confident interval 95.

Base on result research of **Table 1** the majority distribution and frequency there were age 18-35 years old, male, high level education, married , working, easier access to hospital to treatment, weight loss<7 kg, Clinical stage 3 and 4, Negative Co Morbidity.

Result

No	Variable	Frequency	%
1	**Age**		
	18-35 years	213	66.6
	>35 years	107	33.4
2	**Gender**		
	Male	240	75
	Female	80	25
3	**Education**		
	Middle level	83	25.9
	High Level	237	74.1
4	**Married Status**		
	Married	229	716
	Unmarried	91	28.4
5	**Occupation**		
	Working	249	77.8
	No Working	71	22.2
6	**Access to Hospital**		
	Difficult	98	30.6
	Easy	222	69.4
7	**Body Weight**		
	Decreased<7kg	191	59.7
	Decreased ≥ 7 kg	129	40.3
8	**Clinical Stadium**		
	3 and 4 stadium	215	67.2
	1 and 2 stadium	105	32.8
9	**HIV**		
	HIV+TB	160	50
	HIV	160	50
10	Co Morbid		
	Co Morbid positive	50	15.6
	Co Morbid negative	270	84.4
11	**CD4 Before treatment**		
	CD4<350	300	93.8
	CD4 ≥ 350	20	6.3
12	**CD4 After treatment 6 months**		
	CD4<350	143	44.7
	CD4 ≥ 350	177	55.3

Table 1: Distribution and frequency of CPT, age, gender, education, occupation, married status, stadium, comorbid, HIV+TB, bodyweight, CD4 before and after treatment, access to hospital.

Base on **Table 2** result of association analysis the variables were significant with Patent Cooperation Treaty (PCT) and No PCT: CD4 after were given PCT, HIV+TB and HIV without Tb, and infection opportunity positive and negative with p value<0.05; Variables that p value ≤ 0.250 there were clinical stage, education and age; and variables have p value>0.250 there were CD4 before treatment CPT and no CPT, weight loss, access to hospital and treatment, working status and sex.

No	Variable	p Value	OR	OR 95% CI	
				Lower	Upper
1	CD4 After CPT and No CPT	0.000	0.181	0.090	0.363
2	Comorbid CPT and No CPT	0.048	0.288	0.089	0.989

Table 3: The final analysis of CPT compare with no CPT with Variables significant were CD4 and co.morbid.

Base on **Table 3** result research of multivariate analysis the final model only two variables related with PCT compare non PCT significant influence there were CD4 after treatment, and Co morbidity of HIV.

No	CPT			p value	OR	OR 95% CI	
		Before Treatment				Lower	Upper
		CD4 <350	**CD4 ≥ 350**				
1	No CPT	66	6	0.411	0.658	0.243	1.779
	CPT	234	14				
		300	20				
		After Treatment					
		CD 4<350	**CD4 ≥ 350**			0.158	0.080
2	No CPT	11	61	0	0.158	0.080	0.316
	CPT	132	116				
		143	178				
		Age					
		18-35	>35				
3	No CPT	53	19	0.159	0.652	0.363	1.170
	CPT	160	88				
		213	107				
		Sex					
		Male	Female		0.910	0.500	
4	No CPT	53	19	0.759	0.910	0.500	1.655
	CPT	187	61				
		240	80				
		Education					
		Middle level	High Level		1.602	0.905	
5	No CPT	24	48	0.126	1.602	0.905	2.834
	CPT	59	189				
		83	237				
		Married				1.591	0.911
6	No CPT	26	46	0.105	1.591	0.911	2.780
	CPT	65	183				
		91	229				
		No working	Working		1.110	0.596	
7	No CPT	17	55	0.749	1.110	0.596	2.068
	CPT	54	194				
		71	249				
		Access				0.914	0.515
		difficult	easy				
8	No CPT	21	51	0.885	0.914	0.515	1.625
	CPT	77	171				
		98	222				
		Weight loss					
		≥ 7 kg	<7kg		1.164	0.679	
9	No CPT	45	27	0.682	1.164	0.679	1.998
	CPT	146	102				
		191	129				
		Stage				0.607	0.353
		3.4	1.2				
10	No CPT	42	30	0.087	0.607	0.353	1.043
	CPT	173	75				
		215	105				
		HIV +TB	HIV		0.323	0.183	
11	No CPT	21	51	0	0.323	0.183	0.569
	CPT	139	109				
		160	160				
12		IO Positive	IO Negative		0.186	0.056	
13	No CPT	3	69	0.001	0.186		
	CPT	47	201				
		50	270				

Table 2: Analysis Between C PT and CD4, Age, Sex, Education, Married status, Occupation,Access, Weight Loss, Stage, HIV+TB, Co Morbid.

Prevention		CD4 <350	CD4 ≥ 350	p value	OR	95% CI	
						Lower	Upper
No .CP	+Co Morbid	3	0	1.000	1.095	1.018	1.178
	-Co Morbid	63	6				
		66	6				
CP	+Co Morbid	46	1	0.319	3.181	0.406	24.941
	-Co Morbid	188	13				
		234	14				
Total		300	20				

Table 4: Crostab between cotrimoxazole prevention, infection Opportunity and cd4 count before treatment.

Based on **Table 4** result of people with HIV or HIV AIDS before give Cotrimoxazole, CD 4<350 higher amount 300 peoples (94%), and proportion of no CP and CP there were not significant it was mean have not difference between CP, Co Morbid and CD4 count.

Prevention		CD4 <350	CD4 ≥ 350	p value	OR	95% CI	
						Lower	Upper
No .CP	+Co Morbid	1	2	0.397	2.950	0.244	35.662
	-Co Morbid	10	59				
		11	61				
CP	Co Morbid	35	12	0.002	3.127	1.535	6.371
	-Co Morbid	97	104				
		132	116				
Total		143	177				

Table 5: Crostab between cotrimoxazole prevention, infection Opportunity and cd4 count after 6 month treatment.

Base on **Table 5** result people have CD4<350 after given Cotrimoxazole for prevention was decreased 41% for total population (from 300 to 177 peoples). CD4 ≥ 350 become increased from 20 to 177 (8 times increased), it was mean cotrimoxazole prevention very significant increasing CD4.

Discussion

This study assessed the pattern of rational use of CPT among PLWHA in Sulianti Saroso Hospital. Drug Use Evaluation (DUE) is way to ensure that drugs are used appropriately. If the use was inappropriate, intervention with patients or providers was necessary to optimize the drug therapy [3]. Antibiotic therapy purpose is to achieve the best possible clinical outcomes with a reduced risk for developing resistance while consuming least amount of hospital resources. Therefore, studying cotrimoxazole use as preventive therapy among PLWHA helps to understand cotrimoxazole way is being utilized in this hospital. In this study, patient majority (75%) on CPT were male.

Respondent majority were at age between 18-35 years (66.6%) While study in Gondar University Referral Hospital, Ethiopia majority of the patients (61%) on CPT were females, which was same as observations reported from Hawassa Referral Hospital (64.80%) and Jimma Teaching Specialized Hospital (70.99%) [3,4]. Respondent difference in these research were that in Sulianti Saroso hospital, Indonesia majority of respondents were male, meanwhile in Gondar University Referral Hospital majority of respondent were female. Conclusion for research in Jimma Teaching Specialized Hospital was initiation and dose of cotrimoxasole was almost close to being consistent with national guideline but there were some sample that show cotrimoxazole used even if it was contraindicated in these cases.

There were 6.14% patient was used cotrimoxazole in spite of contraindication and 3.59% patients used inappropriate dose, most

of them were subjected to under dose drug. For cotrimoxazole prophylaxis admission, three-fourths of the patients initiated CPT with CD4 counts<350 cell/mm^3 or symptomatic for opportunistic infections prevention, such as PCP, TB, and toxoplasmosis, which was similar with findings reported from study conducted by WHO HIV/AIDS program officers in 69 selected countries and Jimma University Specialized Hospital [5,6].

However, in some patients (WHO stage 1 and CD4 level>350 cells/mL), CPT was initiated without any symptomatic disease, which was not in same line with WHO guideline on cotrimoxazole prophylaxis rational use and supplementary section to the 2013 WHO consolidated guideline; this finding was also higher than the value obtained from Boru Meda Hospital, which was 2% [7]. This result is risk increase cotrimoxazole adverse effects risk increase and antibiotic resistance risk increase since at this time there is no need prophylaxis initiation because the patients' immunity is strong enough to protect against opportunistic infections [8]. Meanwhile in this research, patient that have CD4<350 after given Cotrimoxazole for prevention was decreased 41% for total population (from 300 to 177 peoples). CD4 ≥ 350 become increased from 20 to 177 (8 times increased), it was mean cotrimoxazole prevention very significant increasing CD4.

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