

Evaluation of the Use of Cotrimoxazole Prophylaxis in People Living with HIV/AIDS in Hawassa Referral Hospital: A Retrospective Evaluation

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Abstract: The objective of this study was to evaluate the use of cotrimoxazole prophylaxis in people living with HIV/AIDS, in Hawassa referral hospital, Sothern Ethiopia. This was a retrospective evaluation. A total of 216 patient history cards from Hawassa hospital were included in the study. SPSS v.16 was used to analyze this study. A total of 216 patient cards were collected and analyzed for a drug use evaluation of cotrimoxazole prophylaxis in people living with HIV/AIDS in Hawassa referral Hospital. Out of 216 participants 140(64.8%) female and 76(35.2) were male and one hundred eighty eight (87%) uses appropriate dose of the cotrimoxazole and 28(13%) is inappropriate dose. Our data revealed that there was an improvement on HIV patient CD4, CD8, WHO staging and body weight after the use of cotrimoxazole. In fact this is not the only factor that improves these parameters however; it is the basic agent to come the improvement with other factors. This study had not addressed on monitoring the patient conditions such as some hematological results, due to lack of data on these profiles. So that hematological tests such as complete blood cell count (CBC) and chemistry tests like creatinine clearance should be monitored every six months.

Key words: Body weight, cotrimoxazole, HIV/AIDS, CD4, CD8 and WHO staging

INTRODUCTION

Pharmaceuticals can constitute up to 40% of the health care budget in a developing country, yet large proportion of the population often lack essential medicines. Because of its considerable impact on the quality of care and the cost of treatment, the selection of medicines is antibiotics represent approximately 30% of acute care hospitals' drug expenditure; they are prescribed for 20-50% of inpatients, and contribute to the emergence of resistant microorganisms. Surveys have shown that 22-65% antibiotic prescriptions are either inappropriate or incorrect (Gunton V. *et al.*, 2004).

The inevitable consequences of the wide spread use of antimicrobials has been the emergence of antibiotic-resistant pathogens, fuelling an ever increasing need for new drugs and contributing to the rising cost of medical care. It may focus on one step in the medication use process such as prescribing, or other aspects such as drug labeling or drug administration. It usually focuses on drug or therapies that are high use, high cost, high risk or problem prone (MSH, WHO, 1997).

Cotrimoxazole, a combination of trimethoprim (an inhibitor of bacterial dihydrofolic acid reductase) and sulfamethoxazole (a structural analogue of para-amino benzoic acid that competitively inhibits dihydropterotate synthase) produces sequential block in pathogens metabolic sequence resulting in synergism of the activity of both drugs (Chambers F, 2004).

The spectrum of disease in HIV-positive persons varies among regions. Because Sulfadoxin-Pyrimethamine and cotrimoxazole exert their antimicrobial action by inhibiting the same enzyme in folic acid biosynthetic pathway the emergence of cross resistance to sulfadoxin-pyrimethamine by widespread use of cotrimoxazole is of great concern (MOH, 2006). Therefore the objective of this study was to evaluate the use of cotrimoxazole prophylaxis in people living with HIV/AIDS, in Hawassa referral hospital southern Ethiopia

METHODS

The study was conducted in Hawassa referral and teaching hospital located in Hawassa which is 275km south of capital city of Ethiopia, Addis Ababa. A retrospective study was conducted based on patient medical history records in November 2008 - January 2009.

Drug use evaluation criteria with thresholds were set. The criteria was included the most important aspects of cotrimoxazole use to monitor and evaluate (indications, dose, contraindications, outcomes of therapy). The established criteria and thresholds were approved by the Drug and therapeutics committee of the hospital. The necessary data was collected from patient cards, using data collection format and then evaluated against the preset criteria.

Collecting data was burdensome as we reviewed more than 3500 antiretroviral treatment (ART) and pre-ART cards. The total number of cases with complete data on this case was 216 of which 140 females and 76 males. The year of the data extends from 2006 to 2008. All cases were hospital patients. In all cases the information collected from the card was filled by the physicians and other trained medical persons. SPSS 16.v was used to analyze the data using *Weil coxion* signed rank test.

Ethical clearance was obtained from College of Health Sciences, Hawassa University-Institutional Ethical Review board, and permission was sought from Hawassa referral hospital.

RESULTS AND DISCUSSION

A total of 216 subjects were included in this study, among which 140(64.8%) were females. The mean (standard deviation) age was 31.6(6.6) years (ranging from 1month–65 years), and the majority, 182 (84.25%) were below the age of 41 years.

Three fourth of the study subjects were improved after being the use of the cotrimoxazole. Out of 216 cases 188(87%) used appropriate dose of the cotrimoxazole and 28(13%) was inappropriate dose. In this study the mean distribution of CD4, CD8 and body weight value before cotrimoxazole prophylaxis treatment and while cotrimoxazole prophylaxis treatment (CPT) was 446.93cells/mm³, 933.16cells/mm³, 50.50kg, and 472.72cells/mm³, 1120.08cells/mm³ and 50.95kg respectively.

The correlation between dosing condition and CD4, CD8 and weight was statistically significant ($P < 0.001$) for appropriate dosing, in contrast, this correlation condition violet in inappropriate dosing ($P > 0.005$). But body weight statistically significant both appropriate and inappropriate dosing condition ($P < 0.001$). In this study WHO staging was statistically significant both to appropriate and inappropriate dosing condition ($P < 0.001$).

Drug therapy is considered to be a major component of patient management in health care setting including primary health care. Although the benefits acquired by patients from pharmacological interventions are valuable, the risk of drugs and consequences of inappropriate use cannot be overlooked (Yousif *et al.*, 1997).

A drug use evaluation is a system of improving the quality of the drug utilization in hospitals and clinics. Drug use evaluation is an ongoing, systematic, criteria based program of drug evaluations that will help to ensure that appropriate drug use is provided (MSH/RPM plus, January 2006).

This study is the first attempt to investigate current cotrimoxazole use evaluation patterns in southern Ethiopia and it was conducted in Hawassa referral hospital. Information on cotrimoxazole use evaluation in hospital in current use is scarce and this study is believed to full such gaps.

Table 1: From 216 cases 188(87%) uses appropriate dose of the cotrimoxazole and 28(13%) is inappropriate dose in Hawassa referral Hospital from January 27-2006 to September 28, 2007.

Parameter	Frequency	Percent
Appropriate	188	87.0
Inappropriate	28	13.0
Total	216	100.0

Table 2: Mean distribution of CD4, CD8 and weight before CPT and while CPT in Hawassa referral Hospital from January 27-2006 to September 28, 2007.

Parameters	Before CPT	While CPT
CD4	4446.93	472.72
CD8	8933.16	1120.08
Weight	50.50	50.95

Table 3: Correlation between dosing condition and CD4, CD8 and body weight

Dose	Parameters	Before CPT		While CPT		<i>p</i> -value paired <i>T</i> -test
		Mean	N	Mean	N	
Appropriate	CD4	440.65	188	456.341	88	<0.001
	CD8	932.74	188	1048.04	188	
	Weight	51.72	188	52.13	188	
Inappropriate	CD4	4489.11	28	582.71	28	>0.005
	CD8	935.96	28	1696.05	28	
	Weight	42.30	28	43.0528	28	

Table 4: The correlation between dosing condition and WHO stages

Dose	WHO stage	Before CPT		While CPT		<i>p</i> -value a <i>Weil coxion</i> signed rank test
		N	%	N	%	
Appropriate	1	0	0.0	6	3.2	<0.001
	2	4	2.1	65	34.6	
	3	76	40.4	109	58.0	
	4	108	57.4	8	4.3	
Inappropriate	1	0	0.0	3	10.7	<0.001
	2	0	0.0	7	25.0	
	3	11	39.3	18	64.3	
	4	17	60.7	0	0.0	

The indication of cotrimoxazole for prophylaxis in this study is in agreement with criteria set by federal ministry of health (MOH) of the country. All peoples in the study were symptomatic HIV patients with a WHO stage of II, III and IV. Therefore the indication of cotrimoxazole prophylaxis in this hospital is encouraging.

Inappropriate use and over use of medicines west resources obtain out of pocket payments by patients and result in significant patient harm in terms of poor patient outcomes and adverse drug reactions. As indicated in Table 1, 87% of the patients uses appropriate dose of cotrimoxazole for prophylaxis and the rest 13% uses inappropriate doses in this study per guide line, which is inconsistency uses the study than in Korea (Mwaungulu F., 2004).

Retrospective drug use evaluation in Korea revealed that 10% of prescribed drugs showed that conflict with at least one of the drug use evaluation standards. There was a high incidence of under dosing and over dosing of cotrimoxazole in compared with drug use evaluation criteria of cotrimoxazole in the guide lines.

In this study the mean CD4, CD8, and weight of the patients before and while CPT was 446.93cells/mm³ and 472.72cells/mm³, 933.16cells/mm³ and 1120.08cells/mm³ and 50.50Kg and 50.95Kg respectively. As revealed in Table 2, there is an increment in CD4, CD8 and body

weight after commencing cotrimoxazole prophylaxis besides to the other socio-demographic status of the patients.

Our result revealed that the appropriate drug usage as significance value on CD4, CD8, and body weight of the patient ($P < 0.001$) as indicated in Table 3. In contrast to appropriate usage, inappropriate usage has no statistical association have been seen in CD4 and CD8 ($P > 0.005$). However, there is significant association in case of body weight ($P < 0.001$).

The correlation between dosing condition and WHO stages has a statistical significance in both appropriate and inappropriate dose ($P < 0.001$). Even though, inappropriate dose is not recommended, there is statistical significance ($P < 0.001$) as indicted in Table 4.

CONCLUSION

According to this study there is an improvement on HIV patients CD4, CD8, WHO and body weight after the use of cotrimoxazole. In fact this is not the only factor that improves these parameters however; it is the basic agent to come the improvement with other factors.

Appropriate drug usage is normally recommended by the WHO for all cases however; in some cases there is inappropriate drug use. Even though, in this study there was some cases inappropriate drug use, appropriate drug use is the dominant over those in inappropriate use. Therefore, inappropriate drug use may felt on less improvement on CD4 and CD8 so that appropriate drug use is basically needed to CPT.

This study had not addressed on monitoring the patient conditions such as some hematological results, due to lack of data on these profiles. So that the hematological tests such as complete blood cell count and chemistry tests like creatinine clearance should be monitored every six months accordingly as per national guidelines.

In this study, the safety out comes of the drug were not addressed because there was no record on ADR which are expected from the drugs.

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