EVALUATION OF COTRIMOXAZOLE USE IN THE OUT PATIENT WARD OF SEKA CHEKORSA HEALTH CENTER, JIMMA ZONE, OROMIA REGION, ETHIOPIA

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ARTICLE INFO	ABSTRACT
Article history Received 20/04/2015 Available online 5/5/2015 **Keywords** Cotrimoxazole, Indication, Contraindication, Rational Use, Duration, Guideline.	The main objective of this study was to assess drug use evaluation of cotrimoxazole in the out patient ward of Seka Chokersa health center. Medical records of cotrimoxazole drug indication were analyzed using cross sectional study from one year (June 1, 2012 to June 2, 2013) cards prescribed with cotrimoxazole by systematic random sampling technique. A total of 120 patient cards were reviewed. Of 120 patient records, majority of them were under 15 (76, 63.33) and males (64, 53.34%). From the total females' medical records, 7.14% were pregnant and 5.36% were lactating. In the use of cotrimoxazole, 79% and 86.67% were with correct dose and duration, respectively. Majority of the treatment were consistent with the national guideline for duration (89.16%) and contraindication (86.67%). Majority of the indications, durations and contraindications of cotrimoxazole were in line with standard treatment guideline even though deviation occurs with respect to the dose and drug interaction. Therefore, system for monitoring of drug use should be implemented to take corrective measures and to promote rational drug use.

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INTRODUCTION

Cotrimoxazole is composed of two drugs (trimethoprim and sulphamethoxazole) with similar half lives and synergistic activities [1, 2] with a broad spectrum of action against several microorganisms. Clinically, cotrimoxazole is used for management of infections around urinary tract, respiratory tract, and skin and soft tissues. Additionally the drug is indicated for systemic salmonella infections and opportunistic infections particularly Pneumocystis jiroveci pneumonia and Toxoplasma gondii encephalitis [3-5]

Quality health service can be achieved by the rational use of drugs. Easily accessible and cost effective drugs don't bring quality of care unless they are used rationally [6]. Many reports across the world show an increased irrational use of antibiotics in developing countries paving the way for the emergency of bacterial resistance and increment in health care budget. Formulary revision, training of health care providers and concept of essential medicines were among some of the many different strategies used to tackle this problem despite reports of failure. It is, therefore, mandatory to investigate antimicrobial use in health facilities [7-9].

In many African countries resistant to cotrimoxazole is high. New drugs are an alternative when resistance occurs in developed nations while it will further complicate the health care system in countries like Ethiopia [2, 10]. In several situations, the rational use of antibiotics has been reported to reduce the emergence of resistant strains [11]. Irrational use of cotrimoxazole will be associated with health and economic consequences. Therefore, the general objective of this study was to evaluate the use of cotrimoxazole in the outpatient ward of Seka Chokersa health center.

METHODS

Seka Chokorsa health center is found in Seka town, Jimma zone, South west Ethiopia at a distance of 370kms from the capital city of Ethiopia (Addis Ababa) and 18kms from Jimma Zone. The health center provides a number of services to the society. Retrospective drug use evaluation of cotrimoxazole was done in the outpatient ward from Jun 30–Jul 20 2013 by reviewing one year (June 1, 2012 to June 2, 2013 data) patient cards. Cards with cotrimoxazole within the specified year were taken as source population of the study while the sampled cards were study populations. The Joint Commission on the Accreditation of Health care Organization [JCAHO] criteria was employed to determine sample size. According to these criteria, 5%, 30% and 100% of cases will be reviewed if more than 600, lower than 600, and fewer than 30 average numbers of cases per quarter, respectively [12]. Our study site annual numbers of cases were 2408. Hence, the average numbers of cases per quarter will be 602. Then, 5% of these cases should be reviewed according to JACHO criteria which was 30. Since our study was to evaluate one year patient cards, we multiplied 30 by four and got sample size of 120.

The inclusion criteria were all out patient cards with cotrimoxazole from June 1, 2012 to June 2, 2013. Incomplete patient cards, cards of antibiotic other than cotrimoxazole, inpatient cards with cotrimoxazole and cards of cotrimoxazole out of our specified one year were excluded from the study. After reviewing different literatures a well structured data collection forms were developed to make the language more clear. The data collection forms were further developed after a pretest done in the hospital. Then, informations such as socio-demographic characteristics and drug related information such as indications, drug interaction, contraindication and dosage regimen (dose, frequency and duration) were extracted from the records onto the data collection forms. Age, sex, pregnancy and diagnosis were the independent variables of the study while indications, drug interaction, contraindication and dosage regimen (dose, frequency and duration) were considered as dependent variables. Threshold was set based on standard treatment guideline of Ethiopia for indications, drug interaction, contraindication and dosage regimen (dose, frequency and duration): 100% of the sated criteria should be met for indications and contraindications while 95% and 90% of the criteria should be achieved for dose and drug interactions, respectively [13]. Collection of data was made by principal investigator and analyzed using SPSS 16 after being checked for completeness and consistency. The results were compared with the already set criteria.

Ethical Consideration

Ethical Review Board of Pharmacy department, College of Public Health and Medical Sciences, Jimma University approved the study. Then, a formal request letter from School of Pharmacy, Jimma University was sent to Seka Chekorsa health center in order to get permission to conduct the study. After the purpose of the study was explained, the participants gave their written informed consent for their clinical records to be used in this study prior to the reviews. Confidentiality of the information was assured, privacy was maintained and the record was filed in the document.

RESULTS

Of 120 patient records (Table 1), majority of them were under 15 age (76, 63.33) followed by 15-49 years (26.7%) while age range of 50-65 and above 65 were 10 and 2, respectively. With respect to sex, males (53.34%) were more than females (46.7%). Of 56 (46.67%) females, 87.5% were neither pregnant nor lactating.

Table 1: Socio-demographic characteristics of patients with cotrimoxazole, 2013.

Age	Sex Male		Female		Female Patients Pregnant	Lactating	NPL
	Frequency						
			Frequency	n(%)			
<15	34		42	76(63.3)	-	-	42
15-49	20		12	32(26.7)	4	3	5
50-65	8		2	10 (8.3)	-	-	2
>65	2		-	2(1.7)	-	-	-
Total	64		56	120	4	3	49

NPL: Neither pregnant nor lactating

Compared to total disease state (133) for which cotrimoxazole was used, bacillary dysentery was the leading disease (31.58%) while chancroid was the least (0.05%) as shown in Table 2. Of the indicated cases of cotrimoxazole, the drug was used correctly (100% threshold) for bacillary dysentery, gastroenteritis, urinary tract infection, Pneumocystis carinii pneumonia, dysentery, acute exacerbation of chronic bronchitis, middle ear infections, cholera and chancroid. However, amebiasis, acute laryngitis and tonsillitis were not in line with STG indication of cotrimoxazole (Table 2, Figure 1)

Table 2: Correct indications of cotrimoxazole, 2013.

Indications	n (%)
Bacillary dysentery	42 (31.6)
Gastroenteritis	29 (21.8)
Urinary tract infection	15 (11.3)
Pneumocystis carinii pneumonia	10 (7.5)
Dysentery	8 (6)
Acute exacerbation of chronic bronchitis	6 (4.5)
Middle ear infection	4 (3)
Cholera	3 (2)
Acute rhino sinusitis	2 (1.5)
Chancroid	1
Total	120
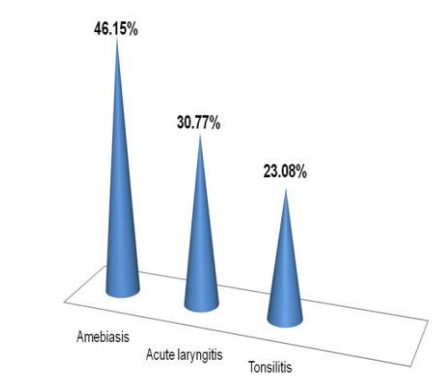
Figure -1: Use of cotrimoxazole not in line with STG, 2013.

In the use of cotrimoxazole, correct dose, under dose and over dose were 79%, 18% and 3%, respectively. But 86.67% were of correct duration (Figure 2). Mostly cotrimoxazole was used for seven days (48%) followed by 5 days and 3 days. Paracetamole takes the highest percentage in terms of interaction while pregnancy was the leading contraindication (four pregnant women) for which cotrimoxazole was used (Table 3).
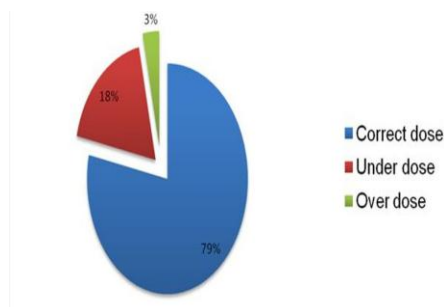
Figure -2: Dose of cotrimoxazloe, 2013.

Table 3: Drug interactions and contraindications of cotrimoxazole use, 2013.

Co-administered Drugs		Contraindications	
	Frequency (%)		Frequency (%)
Paracetamole	22 (43.1)	Pregnant	4 (31)
Albendazole	13 (25.5)	Lactating	3 (23)
Piperazine	9 (17.7)	Advanced age (>65 years)	3 (23)
Mebendazole	5 (9.8)	Smaller age (<2month)	2 (15)
Anticoagulant	2 (3.9)	Anemia	1 (8)
	51 (100)		13 (100)

Drug use evaluation criteria

The study results were compared with the Ethiopian Guidelines sated criteria. As shown in Table 4 the highest percentages in actual performance of cotrimoxazole were indications (89.5%) followed by contraindications (89.2%), durations (86.7%), doses (79%) and drug interactions (57.5%).

Table 4: Actual performance versus set criteria and threshold for cotrimoxazole in OPD of Seka Chekorsa health center, 2013.

Criteria	Threshold (%)	Actual (%)
Indication	100	89.5
Contraindication	100	89.2
Duration	95	86.7
Dose	95	79
Drug interaction	90	57.5

DISCUSSIONS

Antimicrobial resistance costs the life many in Africa due mainly to high utilization problem despite current antimicrobial stewardship programs in different developing countries [14]. Considering proper dose, proper duration, drug interactions, contraindications, special population, and age are crucial parameters to identify proper clinical usage of antimicrobial agents [15]. Survey of different researches proved that Drug Use Evaluation (DUE) is one of the techniques employed to tackle microorganism's resistance to antimicrobial agents [16]. But ensuring rational drug use is the most challenging global problem that can't be controlled by many governors of the world (developing and developed). Mere provision and accessibility of guidelines and policies will not assure rational drug use unless drug use evaluation (DUE) is conducted regularly [16-18].

Many developing countries use cotrimoxazole (CTX) widely as first line agent for management of common infections. Resistance to CTX was documented in many countries dramatically [19]. Therapy will be successful when patients, health care providers and the community work hand to hand. Health care providers should appropriately diagnose select drugs, provide correct dosage form and route, predict probable adverse reactions and interactions along with prevention of drug related complications [12]. The result of our study confirmed that standard treatment guideline was not fully adhered with respect to indication, dosage, duration, contraindication, and drug drug interaction. Of total indications for which cotrimoxazole was used only 89.53% were correct. This finding is less as compared with studies done in other parts of the country reporting 97.98% adherance with the guideline regarding the indication [20] and complete adherance in all cases [21].

According to the present study, the standard treatment guideline was followed in 79% of the dose while the remaining were inappropriately dosed, under dose and over dose. As the threshold set for dose is (95%), less achievement was seen. The finding is lower when compared with the study done in other facilities where the standard treatment guideline was followed by 96.77% and 85.93% [19, 20]. Another study conducted in JUSH and Jimma Health center showed that 100% health professionals' adherence to guidelines for adult and pediatrics dose and frequency of CTX [21, 22]. Inappropriate utilization of treatment guideline may be the

major factor for the difference between our study site and other researches done in Jimma. Drugs will be toxic if given over doses especially in patients with impaired drug excretion or metabolism and under dose may result in treatment failure and is most likely to bring microbial resistance [12].

Rational antibiotic prescribing practice includes "use of the most effective, least toxic, and least costly antibiotic for the precise duration of time needed to cure the infection" **[15].** From the present study it was noted that there was inappropriate duration of therapy in 13.34% of the total indications of which 5% and 8.34% were shorter and longer duration, respectively. This result was not consistent with the set criteria requiring 95% adherance to the guideline. Similar study done in Hawassa refferal hospital regarding the indication of cotrimoxazole for prophylaxis showed 100% agreement with set criteria**.** Inappropriate use of medicines will cause resource and time wastage. And it also comes up with poor patient outcomes and adverse drug reactions [2].

During drug use evaluation study one of the criteria whether the drug is used appropriately or not is evidence based identification of significant drug- drug interactions. In Seka Chekorsa health center there was use of cotrimoxazole with potentially interacting drugs such as Paracetamole followed by Albendazole, Piperazine, Mebendazole, respectively. Drug interaction has two outcomes. It may either leads to toxicity or treatment failure. The study site use of cotrimoxazole with these drugs may be as a result of poor knowledge of prescribers regarding drug-drug interactions and its consequences. Cotrimoxazole was given for four pregnant women for whom it is contraindicated. Compared to the threshold of 100% (Table 4) the performace of the study area was low and dangerous in the health center. The possible reason for such discrepancy may be poor history taking and ineffective laboratory diagnosis.

CONCLUSIONS
Majority of the indications, durations and contraindications of cotrimoxazole were in line with standard treatment guideline even though deviation occurs with respect to the dose and drug interaction. Therefore, system for monitoring of drug use should be implemented to take corrective measures and promote rational drug use. And also nationwide research should be done on rational use of cotrimoxazole.

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