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## Evaluation of cotrimoxazole use as prophylaxis among HIV/AIDS patients in Niger Delta University Teaching Hospital Okolobiri, Bayelsa State

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### Abstract

**Background:** The use of Cotrimoxazole prophylaxis among HIV/AIDS patients on anti-retroviral therapy has demonstrated a significant reduction in morbidity and mortality rates by preventing the reoccurrence of opportunistic infection among HIV-infected patients

**Methods:** Retrospective cohort design study was employed with the use of 273 medical records of 273 HIV/AIDS patients who were on cotrimoxazole prophylaxis were evaluated against the recommendation of the 2010 National Guideline for Treatment, prevention, and Care for HIV/AIDS patients for level of compliance. Knowledge, attitude, and practice of healthcare professionals on cotrimoxazole prophylaxis were also assessed using a structured questionnaire.

**Results:** 55 Patients (20.5%. N= 272) were initiated on Cotrimoxazole prophylaxis when their CD4 cell count was less than 350 cell/mm<sup>3</sup> contrary to 2010 National guidelines' recommendations. Sixteen patients each (5.8%) received an inappropriate dosage of cotrimoxazole and used it against contraindications respectively. There was no significant variation among the health care professionals as regards the basic knowledge of cotrimoxazole. However, physicians seem to have a better attitude and practice skills regarding cotrimoxazole use for HIV/AIDS patients.

**Conclusion:** The use of cotrimoxazole as prophylaxis among HIV/AIDS patients in Niger Delta University Teaching Hospital Okolobiri was consistent with the 2010 National Guidelines' recommendations in most patients regarding CD4 criteria for initiation, dosage, discontinuation, and use in the presence of contraindication. Hence, there was an appropriate use of Cotrimoxazole as prophylaxis among HIV/AIDS patients in this study setting.

**Keywords:** Evaluation, prophylaxis, cotrimoxazole

### Introduction

Opportunistic infections (OIs) are the predominant causes of morbidity and mortality among HIV-infected patients (Mermim *et al.*, 2004; Sharma *et al.*, 2004) [7, 10]. Studies report divergent clinical spectra of OIs in HIV/AIDS depending on socio-economic settings (Iroezindu *et al* 2013) [4]. The main areas affected are the central nervous system, gastrointestinal and respiratory systems, and the skin. The level of immunity determines the occurrence and type of opportunistic infections (Kaplan *et al.*, 2002) [5]. In general, milder infections such as herpes zoster and other skin infection occur early whereas serious life-threatening infections such as Central Nervous System (CNS) toxoplasmosis and cryptococcal meningitis occur later with decreased immunity. Pharmaceuticals can constitute up to 40% of the health care budget in a developing country, yet a large proportion of the population often lacks essential medicines. Because of its considerable impact on the quality of care and the cost of treatment, the selection of medicines in antibiotics represents 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% of antibiotic prescriptions are either inappropriate or incorrect. The inevitable consequences of the widespread use of antimicrobials have 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 drugs or therapies that are high-use, high-cost, high-risk, or problem-prone (MSH, WHO, 1997).

Cotrimoxazole (Trimethoprim/Sulfamethoxazole) is an antibiotic that is used in the treatment of various bacterial, protozoal, and fungi infections. The drug consists of one part of trimethoprim to five parts of Sulfamethoxazole (Vanderveen *et al.*, 2007) [9]. Cotrimoxazole is widely considered a bactericidal agent, though its component have individual bacteriostatic activity (Martindale, 2011) [6]. Its actions are antifolate in nature inhibiting de novo folate biosynthesis and metabolism (WHO, 2014). It is effective in a variety of upper and lower respiratory tract infections, renal and urinary tract infections, skin and wound infections, septicaemias, and other infections caused by sensitive organisms (Vanderveen *et al.*, 2007) [9]. Co-trimoxazole is a simple, well-tolerated, inexpensive antibiotic. When administered regularly as prophylaxis, co-trimoxazole reduces mortality and specifically reduces the risk of pneumonia, diarrhea, malaria, and other opportunistic infections (OIs) in adults and children living with HIV. The World Health Organization (WHO) recommends that co-trimoxazole should be included as an integral part of the HIV chronic care package as it is key to pre-antiretroviral therapy (ART).

Knowledge can be defined as familiarity or understanding of something such as facts, information, description, or skills which is normally acquired through experience or education by perceiving, discovering, or learning. It can also be defined as a theoretical understanding of a subject (Hartley, 1998) [11]. Knowledge is a set of understandings, knowledge, and of "science." It is also one's capacity for imagining, one's way of perceiving (MdM, 2010).

Attitude refers to manner, disposition, feeling, position about a person or thing, tendency, or orientation, especially of the mind. Practice refers to repeated performance or systematic exercise for the purpose of acquiring skill or proficiency (Hartley, 1998) [11]. However, in the context of this work knowledge, attitude, and practice of cotrimoxazole use among health care professionals will include the information, as regards cotrimoxazole use by health care professionals, their manner, feeling on the way cotrimoxazole is used and the level of their performance as it relates cotrimoxazole use.

**Methods:** The study consists of two principal parts, the first aspect was the drug use evaluation study using patient medical records while the second part was the knowledge, attitude, and practice evaluation study. The first part of the study was conducted at Niger Delta University Teaching Hospital Okolobiri Bayelsa State. A retrospective study was conducted based on patient medical history records receiving cotrimoxazole prophylaxis in the facility. Drug use evaluation criteria with thresholds were set. The criteria 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 a data collection format, and then evaluated against the pre-set criteria. The knowledge,

attitude, and practice aspect were conducted among health professionals in NDUTH Okolobiri and FMC Yenagoa.

## Results

A total of 258 patients were evaluated for cotrimoxazole appropriateness in the study, among which 90 (34.9%) were males and 168 (65.1%) were females. 16 (6.20%) patients were in the age group of 12-17 (adolescent) years, whereas 242 (93.2%) patients were under 18 years and above. The mean age of the adolescent patient was 15.063, while patients less than 18 years and above were 34.202. Below is descriptive information on patients on cotrimoxazole prophylaxis in NDUTH

**Table 1:** Shows in age and sex percentage %

Age/Sex	Number	Percentage %
12-17 Year	16	6.20
18 Years >	242	93.7
Male	90	34.9
Female	168	65.1

Results from the study show that 179 patients (65.8%) were placed on cotrimoxazole prophylaxis against PJP while other opportunistic infections such as fungal infection, tuberculosis, cough, and toxoplasmosis recorded 29 (10.6%), 15 (5.5%), 45 (16.4%) and 4 (1.4%) incidences respectively in table 2 below

**Table 2:** Background characteristics of patients evaluated for Cotrimoxazole use

Variables	Number	%
CTX > 1 Yr	195	71.6%
CTX 1 Yr	44	16.17%
CTX 6 Mnts	33	12.1%
HIV Stage 1	29	10.06%
HIV Stage 2	56	20.54%
HIV Stage 3	170	62.5%
HIV Stage 4	17	6.2%
<b>The pattern of Cotrim Use in ART Clinic</b>		
TB	15	5.5%
PJP	179	65.8%
Cough	45	16.4%
Fungal infection	29	10.6%
Toxoplasmosis	4	1.4%

The study shows that 256 (94.1%) patients received an appropriate dose of cotrimoxazole in line with the recommended guideline. 16 (5.8%) patients use cotrimoxazole despite contraindications, with 4 patients having sulpha allergy and 12 patients pregnant in their first trimester. Among 43 patients (15.8%) who discontinued cotrimoxazole use 17 (39.6%) had CD4 cell count > 350. However, from the study done, there was no discontinuation of cotrimoxazole due to the occurrence of side effects. In the knowledge, attitude, and practice study, a total of 100 healthcare professionals responded to 150 questionnaires, giving a response rate of 66% among which 39 (39%) were medical doctors, 30 (30%) were pharmacists 31 (31%) were nurses. The results showed no significant variation among the healthcare professionals as regards basic knowledge of cotrimoxazole prophylaxis for HIV patients. However, the attitude domain, shows that medical doctors seemed to have a better attitude to cotrimoxazole prophylaxis with a mean score value of 2.0 followed by pharmacists at 1.69 and nurses at 1.64 (P-value=0.001). Equally medical doctors

maintained a better practice than other healthcare professionals with a mean score of 1.39, 1.13 for nurses, and 1.00 for pharmacists (P-value =0.009).

### Discussion

This study was able to determine the pattern of use of Cotrimoxazole as prophylaxis among HIV/AIDS patients in NDUTH. One of the greatest problems facing the healthcare system in most developing countries such as Nigeria is ensuring the practice of rational use of drugs, this implies that an individual approach to patient treatment must be clearly defined and observed. However, the presence of drug formulary, standard treatment guidelines, and National guidelines for treatment and care for HIV/AIDS patients in health facilities does not ensure that drugs are prescribed and used rationally. In the study, the use of cotrimoxazole among HIV/AIDS patients did not actually show a high level of consistency with the National guideline in the rationales for indication as only 80.2% of patients who were initiated on therapy when their CD4 cell count was < 350 cells/mm<sup>3</sup>. In 19.8% of the patient who was initiated on cotrimoxazole had CD4 cell count > 350 cells/mm<sup>3</sup>, cotrimoxazole was started without any symptomatic disease. Findings from this study on the rationale for indication and appropriate dose were in line with the study conducted in both Jimma University specialized hospital, Southwest Ethiopia, and Boru Meda Hospital in Northeast Ethiopia. Cotrimoxazole was used despite contraindications in the case of 5.42% of patients, while in 94.5% of cases the drug was used without any contraindications. This equally agreed with the research done at Jimma University Specialized Hospital Southwest Ethiopia. WHO and the Federal University of Health Nigeria recommended the reasons for the discontinuation of cotrimoxazole in people living with HIV/AIDS for better treatment outcomes and for preventing potential drug-related problems (FMOH, 2010). Among 43 patients who discontinued cotrimoxazole only 17 (39.5%) were discontinued on CD4 cell count < 500cell/mm<sup>3</sup> without any sign of side effect. However, the result for discontinuation of cotrimoxazole (39.5%) did not agree with the National guideline. The KAP study shows that the recommendation for the guideline on cotrimoxazole use among people living with HIV/AIDS has not been widely and thoroughly disseminated among healthcare professionals concerned. In general, the result shows that most physicians seem to be more informed about the prophylactic use of cotrimoxazole compared to other healthcare professionals interviewed, thus nurses and pharmacists are patient first and sometimes only contact with the healthcare facility. Their knowledge about HIV care is therefore essential for guiding infected people to receive the appropriate care. However, also found in this study which is specified cotrimoxazole prophylaxis a result already underlined by other studies in developing countries in Africa which clearly agrees with their findings. It equally revealed that caregivers who are directly involved in providing services for HIV/AIDS patients are those who have attended one or two HIV training programs and are more informed about the medical care for HIV infection, this particular result, however, contradicts the research done in Ivory Coast. It was also found that knowledge among healthcare personnel is largely incomplete as regards cotrimoxazole use. The study also shows that the majority of the healthcare professional did not have a copy of the Nigerian guideline for HIV/AIDS for treatment prevention

and care. Nevertheless, rapid, and wide dissemination of information and recommendation is vital so that cotrimoxazole prophylaxis rapidly becomes a useful public health intervention, being part of the case treatments for all intermediary stages of infected people. In a nutshell, the use of cotrimoxazole may be a way of improving the quality of life of millions of Africans infected with HIV and for health workers in Africa, who in the recent past were out of the fight against AIDS.

### Conclusion

The use of cotrimoxazole as prophylaxis among HIV/AIDS patients in NDUTH was consistent with the 2010 National Guidelines' recommendations in most patients as regards CD4 criteria for initiation, dosage, discontinuation, and use in the presence of contraindications. KAP shows no significant variation in their knowledge of cotrimoxazole use, however, medical doctors had better attitudes and practices as compared to healthcare professionals.

### Recommendation

Adequate training programs should be carried out among healthcare professionals regarding cotrimoxazole prophylaxis among HIV/AIDS patients and intensify awareness exercises about the recommendations of National guidelines for treatment, prevention, and care. This will enhance and improve service delivery to patients.

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