

## PATTERN OF PRESCRIPTION OF CO-TRIMOXAZOLE IN HIV-INFECTED CHILDREN FOR PCP PROPHYLAXIS IN MAIDUGURI, NIGERIA

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### Introduction

*Pneumocystis carinii* pneumonia (PCP) is still one of the most common and most threatening opportunistic infections (OI) in HIV-infected children.<sup>1,2</sup> In 1997, the Centers for Disease Control and Prevention (CDC) found PCP to represent one third of AIDS-defining conditions in children less than 13 years of age. The fact that children suffering from PCP often presented with CD4 cell counts far above the 200 cells/ $\mu$ l, which are considered to be the level of immunodeficiency endangering adults, has led to age-related guidelines by both CDC and World Health Organisation (WHO) for primary PCP prophylaxis in HIV-infected children.<sup>1,3</sup> The peak incidence of PCP occurs at 3-6 months of age, with the highest mortality rate in infants younger than one year.<sup>4</sup> However, newer, more aggressive approaches to treatment have improved the outcome substantially.<sup>4</sup> World Health Organisation and CDC issued recommendations for initiation of and discontinuing co-trimoxazole (CTX) prophylaxis in HIV-infected infants and children as a strategy.<sup>2,3</sup> Co-trimoxazole is the most widely prescribed drug for PCP prophylaxis, it is assessable (both geographical and financial) and feasible; The side effects of CTX like rashes, fever, leucopenia, hepatitis, thrombocytopenia, etc. rarely require discontinuation of the prophylaxis (exception-Stevens Johnson syndrome) or therapy as most of these side effects are easily treatable.<sup>2,4,5</sup> The drug appears to be better tolerated in children and risk of toxicity has been considered to be negligible.<sup>2,5</sup> Desensitization and supportive therapy allow us to continue the prophylaxis. Other alternatives (dapsons, atovaquone, or pentamidine) are available in patients with severe adverse reactions. In HIV exposed infants and children, CTX prophylaxis is universally indicated starting at 4-6 weeks after birth and maintained until cessation of risk of HIV transmission and exclusion of HIV infection regardless of CD4 percentage or clinical

### ABSTRACT

**Background:** Health education intervention is a combination of activities aimed at facilitating positive changes in behaviour and practices that may decrease risk of disease and thus reduce mortality and morbidity.

**Methods:** In this study we have assessed the short term effectiveness of health education (clinical presentation) on the prescription of co-trimoxazole (CTX) as prophylaxis for *Pneumocystis carinii* pneumonia (PCP) in a cohort of HIV-infected children at the University of Maiduguri teaching hospital (UMTH).

**Results:** The study showed a significant improvement in correct prescription of CTX for PCP prophylaxis after health education intervention.

**Conclusion:** We concluded that health education intervention within a unit is appropriate, achievable and worthwhile.

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**Keywords:** *Pneumocystis carinii* pneumonia,  
co-trimoxazole, Paediatric HIV

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status.<sup>3</sup> Children who are above 12 months with HIV, PCP prophylaxis is determined by clinical stage and CD4 percent where available. Such CTX prophylaxis should be maintained until age of five years irrespective of clinical or immune response.<sup>3</sup> Several studies have left no doubt about the clinical benefit of CTX in prevention of PCP and have supported the recommendation.<sup>1,6,7</sup> There are no studies that document the practise in this environment and previous studies elsewhere have demonstrated a low prescription rate in appropriate HIV-infected children.<sup>8</sup> We aimed to assess the use of CTX as prophylaxis for PCP in a cohort of HIV-infected children attending paediatric infectious disease unit of university of Maiduguri teaching hospital (UMTH) and to evaluate this in light of the WHO recommendations.

### Methods

The study was a quasi experimental study (before-after) study, conducted among paediatric HIV positive/exposed patients aged 6 weeks-15 years randomly selected in two different occasions at the UMTH, Maiduguri, Nigerian between April and July 2009 .

The diagnosis of HIV was based on 1994 CDC revised classification system for HIV in children less than 13 years of age.<sup>2</sup> A study proforma was developed for collecting the baseline data which included demographic details, paediatric HIV clinical staging, immunologic status (CD4 count/percentage) and drug history in order to assess indication for PCP prophylaxis, type of drug prescribed, presence of adverse drug effect. A total of 100 case folders (pre-intervention) were randomly retrieved in order to determine prescription pattern of CTX for PCP prophylaxis. Children less than 6 weeks of age were excluded. After the first analysis of the result obtained, an organised intervention in form of clinical presentation was carried out to remind/educate doctors working in the unit about the concept and guidelines for PCP prophylaxis in paediatric HIV care. Also a copy of the WHO recommendations for initiation

statistical significant appropriately of the pre and post intervention data. P value of <0.05 was considered statistically significant.

### Results

A total of 200 case folders were surveyed. The folders were dichotomised into two groups (pre and post intervention). The two groups did not differ in age ( $F=0.26$ ,  $p=0.7725$ ) and sex ( $\chi^2=3.87$ ,  $p=0.1347$ ). The median age of the children was 2.5 years (8 weeks-13 years). Majority of the children were in the age range of 1-4 years 167(69.6%). The percentages of HIV-infected children with indication for and were receiving CTX for PCP prophylaxis in both groups were summarised in table 1. Majority of HIV-infected children in our centre have indication for CTX for PCP prophylaxis, however only a quarter (26.9%) of children in the pre-intervention group were on correct

Altered pulmonary physiology and defect in the immune function of HIV-infected patients may account for the predisposition to opportunistic infection in which intact cell-mediated immunity is necessary, as in PCP.<sup>2</sup> Paediatric HIV infection has been listed as an indication for CTX for PCP prophylaxis irrespective of the clinical stage and CD4 count until the age of five because of high incidence of PCP and increase morbidity and mortality among this age group.<sup>2,3</sup> It is also shown that one third of AIDS-defining conditions in children less than 13 years of age present with PCP.<sup>9</sup> An age-specific guideline has been recommended by both CDC and WHO for primary PCP prophylaxis in HIV-infected children.<sup>1,3</sup> Based on either recommendation, in our cohort CTX was indicated in the majority of HIV-infected children but it had been prescribed only in a proportion. Our findings, which are in consonance with a study elsewhere, indicate that CTX prophylaxis is underused with attendant consequences of high incidence of PCP related mortality.<sup>8</sup> Our study demonstrated that post intervention correct prescription of CTX for PCP prophylaxis increased significantly. It was found that most children were on CTX and the number of those not requiring CTX has improved either due to lack of risk or recognition of side effects. Similarly four patients were found to be on alternative drug (due to side effects) with adjunct steroid.

In conclusion, this study clearly demonstrated the great benefit of health education intervention within a unit which led to improvement in correct prescription of CTX for PCP prophylaxis. A significant amount of work need to be done to improve the adherence to WHO guidelines in the paediatric HIV population in our practice in view of the benefit of CTX which translate into long term survival in this group of patients.

**Table 1:** Pattern of Prescription of co-trimoxazole (CTX) among HIV-infected children (n=200)

	<i>Pre-intervention</i>	<i>Post-intervention</i>
	<i>n (%)</i>	<i>n (%)</i>
CTX indicated	93(77.5)	89(74.2)
CTX prescribed*	68(73.1)	87(97.8)
Indication for discontinued CTX	14(20.6)	17(20)
CTX discontinued*	1(7.1)	16(94.1)
Reason(s) for stopping CTX		
Lack of risk	13(92.9)	13(76.5)
Side effects	1(7.1)	4(23.5)

\*P<0.05

of and discontinuing CTX prophylaxis in HIV-infected infants and children was distributed to all the Doctors. Three months after the intervention, the same proforma was used to collect the post-intervention data in a further random sample of 100 folders. The percentage improvement in the prescription practice for PCP prophylaxis using CTX was calculated, Chi-square test ( $\chi^2$ ) and ANOVA were used to determine the

prophylaxis and only 1 out of those who had indication for stopping the prophylaxis was discontinued. After (post) intervention, 97.75% of the HIV-infected with indication for prophylaxis had correct prescription for CTX ( $p<0.05$ ). Sixteen patients on CTX prophylaxis were discontinued following recognition of no longer at risk (12) and development of side effects (4) (Table 1).

### Discussion

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