

An Assessment of Utilization of Intermittent Preventive Treatment of Malaria among Pregnant Women in Lusaka Province of Zambia

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Abstract

Malaria in pregnancy is one of the major global health concerns more especially in malaria-endemic regions where an estimated 30 million pregnancies occur every year. Malaria infection in pregnancy is a major risk factor for maternal and child health.

A comparative cross-sectional study was conducted to assess the utilization and determinants of IPT of malaria by pregnant women in the rural and urban districts of Lusaka Province of Zambia.

Four health centers in each study setting were conveniently selected. A systematic sampling technique was then applied to select the sample from the rural and urban health centers.

Full IPT utilization was low in Lusaka Province. There was no significant difference between rural and urban levels of full utilization of IPT/SP in the Province ($P = 0.288$). There was however, a significant association between availability of fansidar in health facilities and IPT utilization in Lusaka ($P = 0.012$) while Chongwe showed insignificant association ($P = 0.373$).

This study demonstrated that utilization levels of IPT/SP of malaria were very low in both the rural and urban districts despite the availability of Fansidar in health facilities. Education level and economic status were not significant factors for pregnant women to utilize IPT/SP services.

Keywords: Malaria in pregnancy; IPTp utilization; Lusaka province

Abbreviations:

ACT: Atermisinin Combination Therapy; SP: Sulphadoxine-Pyrimethamine; DHIS: District Health Information Software; IPT: Intermittent Preventive Therapy; IRHS: Indoor Residual House Spraying; ITN: Insecticide Treated Nets; LLIN: Long Lasting Insecticidal Nets; PAM: Pregnancy Associated Malaria; WHO: World Health Organization

Introduction

Malaria in pregnancy continues to be one of the major global health concerns more especially in malaria-endemic regions where an estimated 30 million pregnancies occur every year [1-3]. Malaria infection in pregnancy is a major risk factor for maternal and child health, and substantially increases the risk of miscarriage, stillbirth and low birth weight [4,5].

Pregnant women are at a higher risk of catching malaria in areas of stable transmission due to the lowering of their immunity during the development of the fetus [6]. This is one of the reasons attributed to the increased susceptibility of pregnant women to malaria [7].

An estimated 18% of severe anaemia in pregnancy is secondary to malaria [4]. In Sub-Saharan Africa alone, an estimated 200,000 to 500,000 pregnant women develop severe anaemia [4].

Severe complications of malaria during pregnancy include maternal anemia, cerebral malaria, and maternal mortality, which tend to be on an increase during epidemics and among immunocompromised pregnant women [8,9].

Complications affecting the fetus or newborn arise from either clinical malaria or asymptomatic parasitemia during pregnancy and include stillbirth, miscarriage, low birthweight, preterm delivery, and neonatal mortality [8,9].

Since the year 2005, World Health Organization (WHO) recommended the policy of protecting women during pregnancy using intermittent preventive treatment (IPTp) with one curative regimen of sulphadoxine-pyrimethamine (SP) (1,500 mg sulphadoxine and 75 mg pyrimethamine), at least twice during pregnancy.

Intermittent Preventive Treatment of Malaria in Pregnancy (IPTp) involves the administration of a curative treatment dose of an effective anti-malaria drug at scheduled intervals during pregnancy [10-12].

IPTp with SP has proven efficacious in reducing the burden of pregnancy-associated malaria (PAM), and is currently part of the national malaria prevention program in many countries.

WHO guidelines call for multi-pronged approach involving both preventive and curative measures with the following Focused Antenatal Care recommendations: a) Use of insecticide treated nets (ITN) [13]; b) Focused antenatal care and health education; c) Use of Intermittent Preventive Treatment of Malaria in Pregnancy (IPTp), and; d) Case management of women with features of clinical malaria [14].

It is estimated that use of IPTp reduce the occurrence of low birthweight by 42%, placental malaria by 65%, neonatal death by 38%, and antenatal parasitemia by 26% [12].

Two doses of IPTp with SP provide considerable benefit to HIV-negative semi-immune pregnant women even in situations where SP monotherapy for symptomatic malaria results in up to 25% treatment failures [15].

Despite the effectiveness of IPTp, and the nearly universal adoption of a national IPTp policy among malaria endemic countries, evidence shows that IPTp-SP uptake as well as ITN coverage among pregnant women is very low in most countries, and lowest in areas with highest transmission of malaria [16-18].

Zambia is not an exception case as malaria is endemic in the country with peaks during the rainy season.

This study therefore aimed at assessing the utilization and determinants of Intermittent Preventive Treatment of malaria by pregnant women in rural and urban health facilities of Lusaka Province.

The variables of this study were IPT Utilization (dependent variable), education, occupation and availability of service (Independent variables).

Materials and Methods

Study location and population

Lusaka Province is the smallest of the ten provinces in Zambia with a surface area of 21,896 square kilometers [19].

The province is located in the southern zone of the country and lies between latitudes 14°S and 16°S, and longitudes 27°E and 30°E [20,21].

The province shares internal borders with Central, Eastern and Southern provinces, and international borders with Mozambique and Zimbabwe in Luangwa District.

Lusaka Province had an estimated population of 2,580,419 accounting for 17% of the country's total population in the year 2013.

Although it is the smallest province, Lusaka is the most populated province and has the highest annual population growth rate of 4.7% in the country [19].

The population of this study however included only pregnant women in their 3rd trimester of pregnancy attending ante-natal clinics.

This group was chosen because all the three recommended doses of fansidar should have been taken at this stage by pregnant women.

Pregnant women not in 3rd trimester and not willing to participate in the survey were excluded from the study.

Study design

A comparative cross-sectional study was conducted to assess the utilization and determinants of IPT of malaria by pregnant women in the rural and urban districts of Lusaka Province of Zambia.

Research sites included four urban health centers-Chipata, Chilenje, Kabwata and Kalingalinga in Lusaka District; and four rural health centers-Chalimbana, Kanakantapa, Kampekete and Lwimba in Chongwe District.

Sampling technique

Four health centers in each study setting were conveniently selected. Stratification by socio-economic status was used for Lusaka District where two health centers were being attended by people from moderate to high socio-economic background and the other two facilities by people from the low socio-economic background.

This was to ensure that pregnant women from all socio-economic backgrounds were included. Easily accessible health facilities were considered for Chongwe District. A systematic sampling technique was then applied to select the sample from the rural and urban health centers.

Every second pregnant woman in 3rd trimester of pregnancy attending ante natal clinic during data collection and willing to participate was included in the study.

Data collection and analysis

Data collection was conducted over a period of three weeks and four days starting from 6th August to 31st August 2015.

Eight research assistants were oriented and helped in data collection. Structured questionnaires were used to collect data from respondents in both study sites involving eight health centers.

Data analysis was done using Statistical Package for Social Sciences (SPSS). Chi square statistical tests were carried out to test for association between the dependent variable and the independent variables. Results yielding p-value of 5 percent were considered statistically significant.

Results

Rural and Urban utilization of IPT/SP

Of the 426 respondents who were interviewed in the rural district of Chongwe on IPT utilization, 2 (0.53%) took fansidar four times and 115 (26.9%) took three times, making full utilization of IPT/SP 117/426 (27.4%).

The remaining 180 (42.2%) respondents took fansidar two times, 103 (24.2%) took once and 25 (5.9%) did not take any at all.

In the urban district of Lusaka, out of a total of 425 respondents who were interviewed, 6 (1.4%) took fansidar four times, 126 (29.6%) took three times, making full utilization of IPT/SP service 132/425 (31.0%).

The remaining 152 (35.8%) respondents took fansidar two times, 137 (32.2%) took only once and 5 (1.2%) did not take any at all.

There was no significant difference between rural and urban levels of full utilization of IPT/SP in Lusaka Province ($P = 0.288$). Table 1 shows IPT utilization in sampled health centers.

Availability of fansidar in health facilities

Table 2 shows results on availability of fansidar in sampled health facilities in Lusaka Province. There was a significant association between availability of fansidar in health facilities and IPT utilization in Lusaka ($P = 0.012$).

Respondents who said fansidar was not always available at the health facilities were less likely to have fully utilized the IPT/SP service in Lusaka. There was insignificant association between availability of fansidar in health facilities and IPT utilization in Chongwe District ($P = 0.373$). Those who utilized and those who did not fully utilize the service said fansidar was always available in Lusaka.

The same response was observed in Chongwe where 351 respondents said that fansidar was always available in health facilities.

Characteristics	Fully Utilized IPT/SP n[%]	Not Utilized IPT/SP n[%]	Total n[%]	X2	P - Value
Chongwe					
Chalimbana	53[46.5]	72[23.2]	126[29.5]	21.73	0.001
Kampekete	24[20.8]	81[26.2]	105[24.7]		
Kanakantapa	19[16.8]	58[18.8]	78[18.3]		
Lwimba	18[15.8]	99[31.7]	117[27.4]		
Total	115[100]	311[100]	426[100]		
Lusaka					
Chipata	27[20.5]	73[24.9]	100[23.5]	79.28	0.001
Chilenje	64[48.5]	46[15.7]	110[25.9]		
Kabwata	38[28.8]	71[24.2]	109[25.6]		
Kalingalinga	3[2.3]	103[35.1]	106[24.9]		
Total	132[100]	293[100]	425[100]		

Table 1: Utilization of IPT in Chongwe and Lusaka districts. *Results significant at $P \leq 0.05$.

Characteristics	Fully Utilized IPT/SP n[%]	Not Utilized IPT/SP n[%]	Total n[%]	X2	P - Value
Is fansidar always available in health facilities?					
Chongwe					
yes	112[97.0]	291[93.7]	403[94.6]	0.79	0.373
No	3[3.0]	20[6.3]	23[5.4]		
Total	115[100]	311[100]	426[100]		
Lusaka					
Yes	128[97.0]	261[89.0]	389[91.5]	6.28	0.012
No	4[3.0]	32[10.9]	36[8.5]		
Total	132[100]	293[100]	425[100]		

Table 2: Availability of fansidar and IPT/SP utilization. *Results significant at $P \leq 0.05$.

Demographic characteristics of respondents in relation with IPT utilization

results indicate that there was no significant association between education level and IPT utilization in both Chongwe and Lusaka districts.

Table 3 shows the association between education level and IPT utilization in Chongwe and Lusaka districts of Lusaka Province. These

Characteristics	Fully Utilized IPT/SP n[%]	Not Utilized IPT/SP n[%]	Total n[%]	X2	P - Value
Chongwe					
University/ College	2[2]	8[2.6]	10[2.4]	0.62	0.89
Secondary	39[33.7]	97[31.4]	136[32.0]		
Primary	60[52.5]	161[51.7]	221[51.9]		
No Education	14[11.9]	45[14.4]	59[13.7]		
Total	115[100]	311[100]	426[100]		
Lusaka					
University/ College	11[8.3]	27[9.2]	38[8.9]	1.69	0.639
Secondary	62[47.0]	129[44.0]	191[44.9]		
Primary	54[40.9]	117[39.9]	171[40.2]		
No Education	5[3.8]	20[68.3]	25[5.9]		
Total	132[100]	293[100]	425[100]		

Table 3: Education level and IPT/SP utilization. *Results significant at P ≤ 0.05.

Characteristics	Fully Utilized IPT/SP n[%]	Not Utilized IPT/SP n[%]	Total n[%]	X2	P - Value
Chongwe					
House wife	68[59.4]	223[71.6]	291[68.3]	5.81	0.121
Formally employed	18[15.8]	34[11.1]	53[12.4]		
Self employed	16[13.9]	25[8.1]	41[9.7]		
Student	13[10.9]	29[9.2]	41[9.7]		
Total	115[100]	311[100]	426[100]		
Lusaka					
House wife	90[68.2]	191[65.2]	281[66.1]	0.37	0.946
Formally employed	25[18.9]	61[20.8]	86[20.2]		
Self employed	10[7.6]	23[7.8]	33[7.8]		
Student	7[5.3]	18[6.1]	25[5.9]		
Total	132[100]	293[100]	425[100]		

Table 4: Occupation and IPT/SP utilization. *Results significant at P ≤ 0.05.

Table 4 shows the association between occupation and IPT utilization in Chongwe and Lusaka districts.

These results show that there was no significant association between occupation and IPT utilization in both Chongwe and Lusaka districts.

Characteristics	Fully Utilized IPT/SP n[%]	Not Utilized IPT/SP n[%]	Total n[%]	X2	P - Value
Chongwe					
Age (years)					
<24	51[44.6]	133[42.8]	184[43.2]	0.53	0.767
24 -34	55[47.5]	146[46.8]	200[47.0]		
35 and above	9[7.9]	32[10.4]	41[9.7]		
Total	115[100]	311[100]	426[100]		
Lusaka					
Age (years)					
<24	51[38.6]	107[36.7]	158[37.3]	0.2	0.767
24 -34	71[53.8]	161[54.8]	232[54.5]		
35 and above	10[7.6]	25[8.5]	35[8.2]		
Total	132[100]	293[100]	425[100]		

Table 5: Age distribution and IPT/SP utilization. *Results significant at $P \leq 0.05$.

Age distribution and IPT/SP utilization

In both rural (Chongwe) and urban (Lusaka) districts the majority of respondents 146 (46.8%) and 161 (54.8%) respectively were aged between 24 -34 years. Table 5 shows these results.

Discussion

Malaria remains a major public health concern on the global agenda as it continues to affect masses including children and pregnant women. This research sought to assess the utilization of Intermittent Presumptive Treatment of malaria using fansidar and also to determine factors associated with it among pregnant women in the third trimester of their pregnancies in rural and urban setting of Lusaka Province of Zambia. Full utilization of the service was measured by those women who had received at least three of the four doses of IPT/SP according to the national policy. Pregnant women who received less than three doses were considered not to have fully utilized the service. Results were based on the analyses of the responses from a sample size of 426 pregnant women in their third trimester from the rural district of Chongwe and 425 from Lusaka Urban District.

Pregnant women in Zambia are expected to attend ANC clinics at least three times during their gestation period in which they are expected to receive at least three of the four doses of fansidar which is considered as full utilization of service. Findings of this study have shown that utilization levels of IPT/SP in Lusaka Province were very low. In the rural setting, 27.3% had fully utilized the IPT/SP service while 31% had fully utilized the service in the urban setting. These results are similar to a study conducted on use of Presumptive Treatment and Insecticide-treated bed nets by pregnant women in four Kenyan districts where full utilization of IPT/SP was as low as 5% [22]. In another study conducted in Uganda, findings indicated that only 31.3% fully utilized IPT/SP services. These results show that IPT

utilization is low among pregnant women which are root cause of persistent malaria-related complications in pregnancy globally [23].

The provision of quality health service is an important factor in determining health seeking behavior of clients. One of such factors is the availability of drugs in health facilities. In this particular study, there was a significant finding on the availability of fansidar in the health facilities in urban setting (Lusaka District). In Lusaka District, 97% and 89.1% of those who fully utilized the service and those who did not utilize the service respectively said that fansidar was always available in the health facilities. In the rural district of Chongwe, 91.5% of respondents who were interviewed said fansidar was always available in health facilities. Like many other similar studies, fansidar has always been available in health facilities [23-25]. Low uptake of IPT of malaria among pregnant women should not be attributed to shortage of fansidar in health facilities. This study considered only two demographic factors; education level and occupation in relation with IPT utilization. The study found no significant associations between these demographic characteristics and utilization of IPT/SP in both rural and urban setting of Lusaka Province. This study is similar to several studies conducted globally where associations between IPTp use and education have been inconsistent across studies [24-29]. These studies have also shown lack of association between IPTp use and socio-demographic factors such as household wealth and travel times to the ANC clinics.

The main limitation of this study was inadequate time allocated to conduct the research. Funds were not available to sample all the four original districts of Lusaka Province and transport cost was an issue to travel from Dalian China to Lusaka Zambia.

Competing Interests

The authors declared that they have no competing interests.

Author's Contributions

MK designed the study, developed and programmed the model and drafted the manuscript. XL conceived the study and review of the manuscript. Both authors read and approved the final manuscript.

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