



Intermittent preventive therapy with sulfadoxine-pyrimethamine is effective in preventing maternal and placental malaria in Ibadan, Southwestern Nigeria

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Background



- The pregnant woman runs a higher risk of contacting malaria than her non-pregnant counterpart
- Although malaria in pregnancy is often asymptomatic, in the semi immune woman, it is nevertheless the cause of unfavorable pregnancy outcomes both in the mother and baby
- To prevent the adverse effects of malaria in pregnancy, antimalarial chemoprophylaxis is generally recommended.
- Weekly pyrimethamine or chloroquine was widely adopted in many African countries for a long time
- Poor compliance and emergence of drug resistant strains of *Plasmodium falciparum* have however compromised the efficacy of these regimens
- Intermittent preventive therapy with sulfadoxine-pyrimethamine (IPT-SP) is now the currently recommended regimen for prevention of malaria in pregnancy in endemic areas.
- There is a paucity of data on the effectiveness of IPT-SP from West Africa in general and Nigeria in particular



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Objective, Study & Ethical Issues



Objective

- To evaluate the effectiveness of IPT-SP in the prevention of maternal and placental malaria in parturient mothers in Ibadan, southwestern Nigeria, where the risk of malaria is present all year round.

Study site

- St Mary's Catholic Hospital Eleta (a 2^oHCF) in Ibadan Southwestern Nigeria
- 18 month period -May 2003 and October 2004.

Ethical issues

- Ethical approval was obtained from the University of Ibadan/University College Hospital and Boston University (collaborating institution) Institutional Review Boards
- Informed consent was signed by each study participant or her legal guardian (mother or husband) for those less than 18 years of age.



Patients and Methods



- 983 parturient mothers who participated in a larger prospective observational study on epidemiology of congenital malaria in Ibadan, Nigeria were studied
 - 598 (60.8%) received intermittent preventive therapy (IPT-SP)
 - 214 (21.8%) received pyrimethamine (PYR)
 - 171 (17.4%) received no chemoprophylactic agent (NC).
- Definitions
 - Low birth weight (LBW) <2500grams,
 - Anemia = hematocrit <30%
 - Preterm delivery = gestational age <37weeks gestation
- Data collection
 - Demographic details and chemoprophylactic drug taken were documented
 - Thick blood smears were prepared from mothers, placentae, cord and neonates
 - Geimsa stained smears screened under light microscope at X100 magnification
- Data analysis
 - Preliminary analysis was done with EPI-INFO and then transferred to SPSS version 10
 - The student t-test was used to compare two mean values
 - One way ANOVA was used to compare mean values in more than two groups.
 - χ^2 test was used to investigate associations between 2 categorical variables and to compare proportions.
 - p-value <0.05 was considered statistically significant.



Table 1: Characteristics of Parturient Women who Used IPT-SP, Pyrimethamine (PYR) or No Chemoprophylactic Agents (NC)



CHARACTERISTICS	SP-IPT (n = 589)	PYR (n = 214)	NC (n = 171)	p- value
Age (Years) Mean \pm SD Range	29.6 \pm 5.7 17 - 44	29.4 \pm 4.9 18 - 43	30.1 \pm 5.3 17 - 42	0.408
Maternal Education n (%)				
None	13 (2.2)	3 (1.4)	4 (2.3)	0.307
Primary/Qur'anic	74 (12.4)	31 (14.5)	26 (15.2)	
Secondary school	359 (60.3)	122 (57.0)	85 (49.7)	
Post 2 ^o School	149 (25.0)	58 (27.1)	56 (32.7)	
Total	595 (100)	214 (100)	171 (100)	
Gravidity n (%)				
1	133 (22.2)	49 (22.9)	48 (28.2)	0.516
2	127 (21.2)	50 (23.4)	35 (20.6)	
> 2	338 (56.5)	115 (53.7)	87 (51.2)	
Baby's Sex Male n (%)	310 (51.8)	107 (50)	99 (57.9)	0.268



Table 2. Effects of IPT-SP, Pyrimethamine or No Chemoprophylactic Agent (NC) on Malaria Parasitaemia and Pregnancy Outcomes in Parturient Women in Ibadan, Southwestern Nigeria



Outcome measure	IPT-SP N = 598 n (%)	Pyrimethamine N = 214 n (%)	NC N = 171 n (%)	P value
<i>Maternal parasitemia</i>	62 (10.4%)	34 (15.9)	29 (17.0)	0.021
<i>Placental parasitemia</i>	63 (10.5%)	36 (16.8)	29 (17.0)	0.015
<i>Cord parasitemia</i>	16 (2.7%)	9 (4.2)	9 (5.3)	0.210
<i>Neonatal parasitemia</i>	4 (0.7%)	3 (1.4)	1 (0.6)	0.553
<i>Maternal hematocrit (%)</i> Mean \pm SD Range	36.48 \pm 4.55 18 - 45	36.39 \pm 4.7 20 - 45	35.17 \pm 5.58 17 - 45	0.006
<i>Maternal anemia</i> (Hematocrit <30%)	33/579 (5.7%)	19 (8.9)	26 (15.4)	<0.0001
<i>Pre-term delivery</i> (Gestational age <37 weeks)	63 (10.5%)	41 (19.2)	43 (25.3)	<0.0001
<i>Neonatal birth weight (gm)</i> Mean \pm SD Range	3204.3 \pm 487.2 1500 - 4700	3075.7 \pm 513.24 1300 - 4500	3074.7 \pm 505.9 1400 - 4500	<0.0001
<i>Low birth weight (%)</i>	31/595 (5.2)	17 (7.9)	16 (9.4)	0.095
<i>Neonatal hematocrit (%)</i> Mean \pm SD Range	58.2 \pm 7.8 35 - 79	57.1 \pm 7.66 34 - 75	56.8 \pm 8.0 31 - 75	0.041



Table 3: Risk of Malaria Parasitaemia and Pregnancy Outcomes among Parturient Women who Received IPT-SP versus Pyrimethamine or No Chemoprophylaxis in Ibadan, Nigeria



Parameter	IPT-SP vs PYR			IPT-SP vs NC		
	OR	95% CI	p-value	OR	95% CI	p-value
Maternal parasitaemia	0.612	0.39-0.96	0.036	0.57	0.35 - 0.91	0.019
Placental parasitaemia	0.582	0.37-0.91	0.02	0.577	0.36 - 0.93	0.022
Maternal anemia (Hematocrit <30%)	1.62	0.91-2.92	0.11	3.008	1.74 - 5.19	<0.0001
Pre-term delivery (GA <37 weeks)	2.03	1.31-3.31	0.002	2.88	1.84 - 4.35	<0.0001



Safety Issues & Conclusion



Safety Issues

- Adverse events reported by study participants on IPT-SP and other chemoprophylactic agents were mild and did not necessitate any treatment.

Conclusion

- IPT-SP is highly effective in preventing maternal and placental malaria among parturient women in Ibadan, southwestern Nigeria as well as in improving pregnancy outcomes, including a lower prevalence of pre-term deliveries, bigger babies and lower prevalence of maternal anemia.
- Our study has once again confirmed the lack of efficacy of pyrimethamine for the prevention of maternal and placental malaria in pregnant Nigerian women