

NUMBER OF DOSES OF SULPHADOXINE-PYRIMETHAMINE FOR INTENSIVE THERAPY AND PREGNANCY OUTCOME AMONG PARTURIENTS DELIVERING AT LAUTECH TEACHING HOSPITAL, OGBOMOSO

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Background: Malaria infection during pregnancy is associated with adverse maternal and foetal outcomes especially in sub-Saharan Africa. Due to development of resistance to SP, WHO currently recommends uptake of SP at each scheduled antenatal care (ANC) visit at least four weekly apart, but the effects of number of doses of SP on pregnancy outcomes still require comprehensive review.

Objectives: To determine the prevalence of maternal, umbilical cord and placental malaria parasitaemia by microscopy and to know the impact of number of doses of IPT-SP on the prevalence of maternal, umbilical cord and placental parasitaemia as well as pregnancy outcomes.

Methodology: Participants were recruited during booking clinic. IPT-SPs (Three tablets of SP containing 500mg sulphadoxine and 25mg pyrimethamine per tablet (Maldox® Emzor Pharmaceutical PLC, NAFDAC Reg. no; 04-2911)) were administered to participants in ANC under directly observed therapy (DOT) at least four weekly apart and recorded in the ANC case note. At each follow-up visit, participants were asked about adverse drug reactions to SP, malaria symptoms, and routine obstetric issues. Symptomatic women found to be parasitaemic were given artemether-lumefantrine. Packed cell volume was checked btw 34-36 weeks of gestation. Two millilitres of maternal, umbilical cord and placenta blood were collected at delivery for diagnosis of malaria by microscopy.

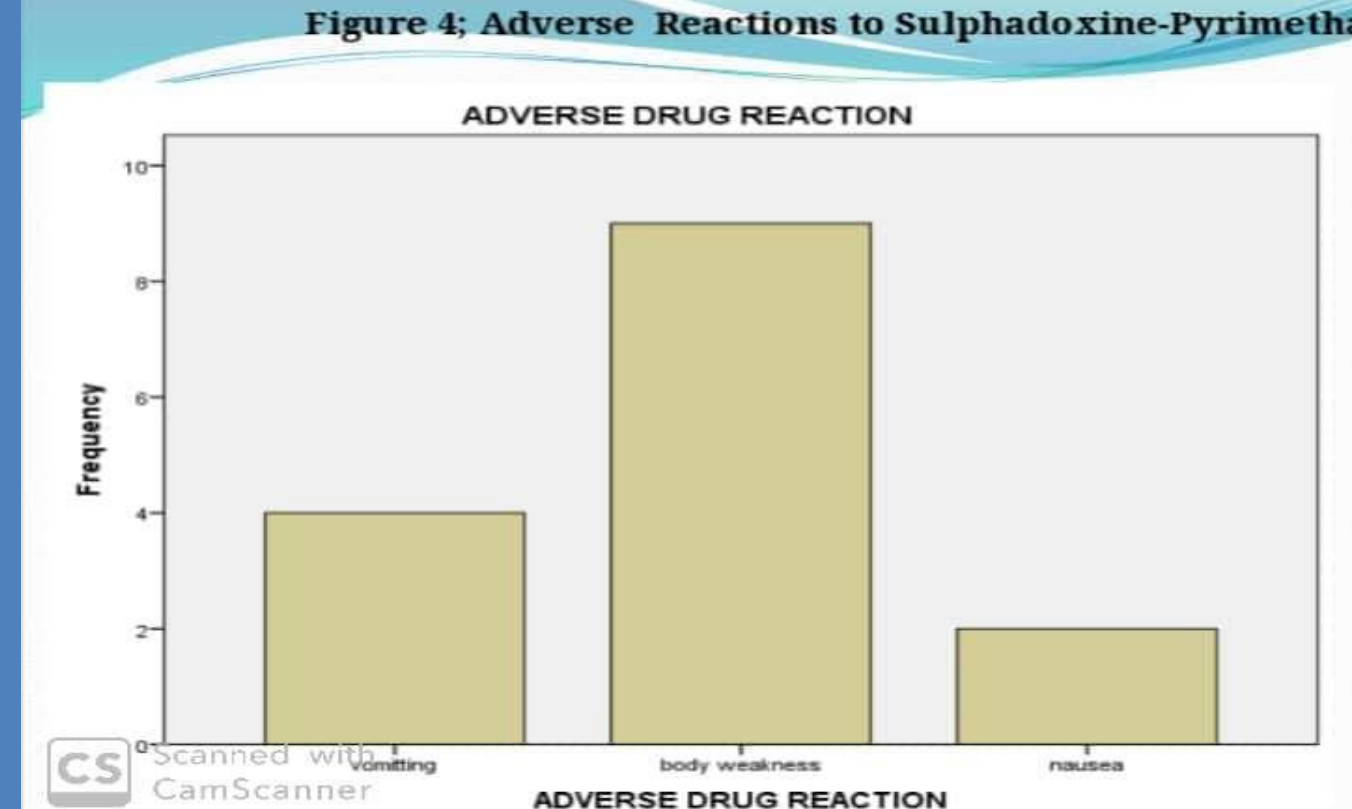
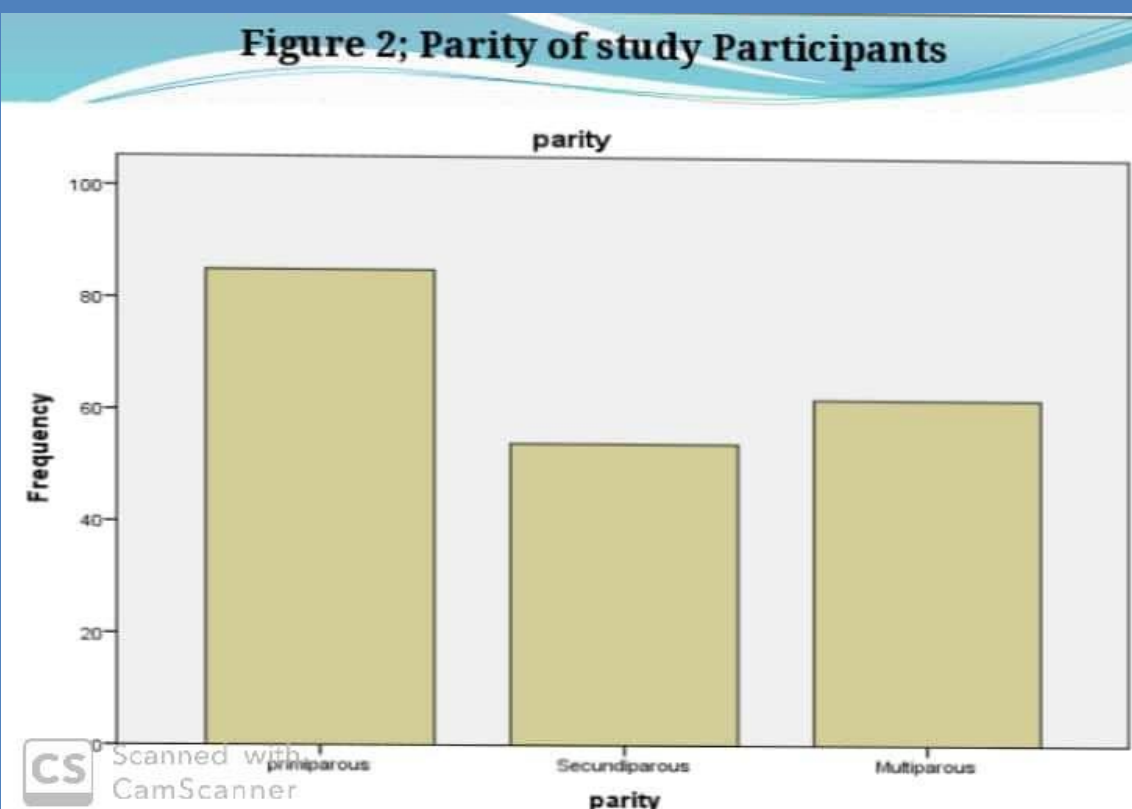
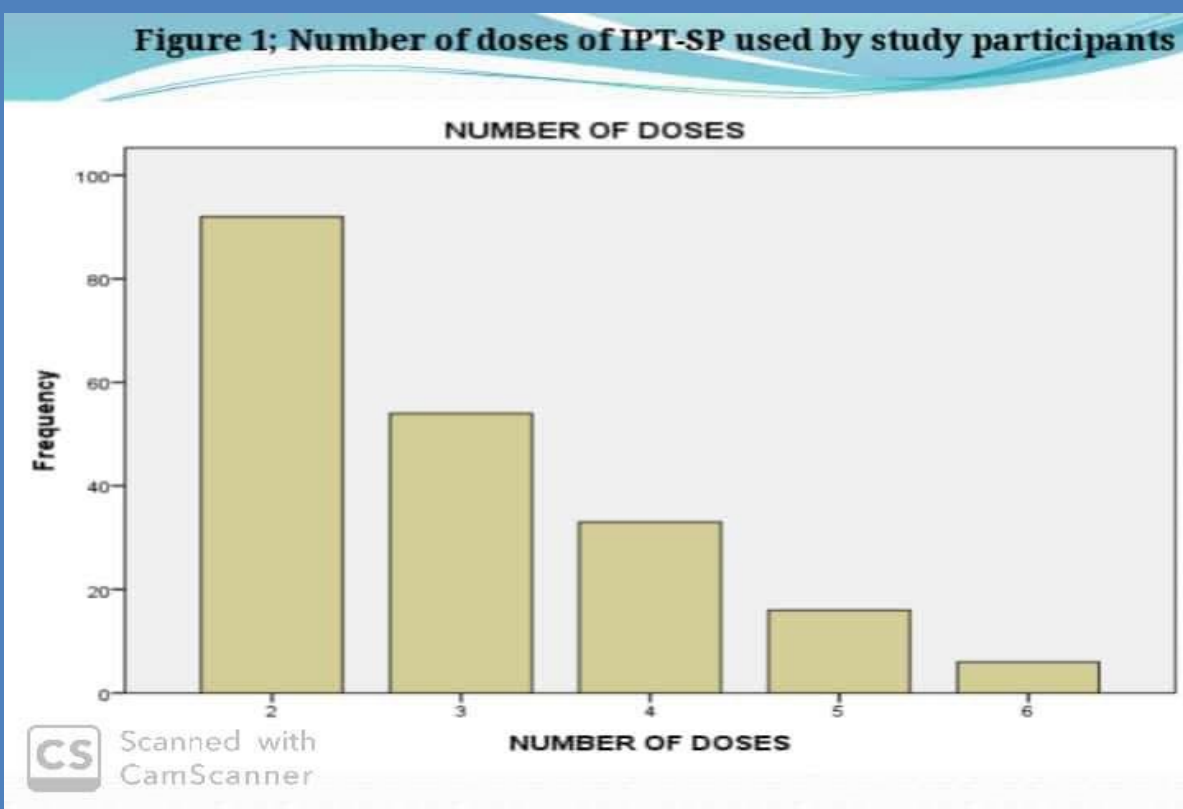


Table 3: Placenta, umbilical cord and maternal malaria parasitaemia vs. the doses of IPT-SP taken by the study participants							
Characteristics	2 DOSES OF SP n (%)	3 DOSES OF SP n (%)	4 DOSES OF SP n (%)	5 DOSES OF SP n (%)	6 DOSES OF SP n (%)	Chi square LRχ ²	P value
Placenta Parasitaemia; Microscopy							
a) All	48(55.8)	12(23.5)	5(15.2)	1(6.3)	0(0.0)	37.841	0.001*
b) Primigravidae	18(50.0)	1(7.1)	5(27.8)	1(9.1)	0(0.0)	17.200	0.002*
c) Secundigravidae	14(58.3)	4(22.2)	0(0.0)	0(0.0)	0(0.0)	13.671	0.003*
d) Multigravidae	16(61.5)	7(36.8)	0(0.0)	0(0.0)	0(0.0)	18.250	0.001*
Maternal Peripheral Parasitaemia; Microscopy							
a) All	49(55.1)	12(22.6)	7(21.2)	1(6.3)	0(0.0)	34.400	0.001*
b) Primigravidae	17(45.9)	2(14.3)	7(38.9)	1(9.1)	0(0.0)	12.973	0.011*
c) Secundigravidae	16(64.0)	4(22.2)	0(0.0)	0(0.0)	0(0.0)	16.569	0.001*
d) Multigravidae	16(59.3)	6(28.0)	0(0.0)	0(0.0)	0(0.0)	18.137	0.001*
Umbilical Cord Parasitaemia; Microscopy							
a) All	48(55.8)	10(19.6)	3(9.1)	1(6.3)	0(0.0)	45.430	0.001*
b) Primigravidae	18(50.0)	2(14.3)	3(16.7)	1(9.1)	0(0.0)	16.197	0.003*
c) Secundigravidae	15(62.5)	3(16.7)	0(0.0)	0(0.0)	0(0.0)	17.367	0.001*
d) Multigravidae	15(57.7)	5(26.3)	0(0.0)	0(0.0)	0(0.0)	17.399	0.002*

Table 5: Duration of last dose of IPT-SP to delivery vs. parasitaemia and pregnancy outcome				
Characteristics	Duration ≤ 4 wks n (%)	Duration > 4 wks n (%)	Chi square	P value
+ve maternal malaria parasitaemia	23 (33.3)	46 (66.7)	7.623	0.006*
+ve umbilical cord malaria parasitaemia	18 (29.0)	44 (71.0)	11.707	0.001*
+ve placental malaria parasitaemia	21 (31.8)	45 (68.2)	9.156	0.002*
Anaemia at delivery	3 (27.3)	8 (72.7)	1.866	0.172
Preterm delivery	1 (12.5)	7 (87.5)	4.04	0.044*
	4 (22.2)	14 (77.8)	4.974	0.026*

Results: A total of two hundred and ten (210) participants were recruited into the study, 192 (91.43%) participants completed the study.

The median number of doses of IPT-SP received by the study participants is three (3) doses.

The prevalence of maternal, placenta and umbilical cord malaria parasitaemia were 35.0%, 34.4% and 32.3% respectively.

There is added benefit of more than 3 doses of IPT-SP on the occurrence of malaria parasitaemia demonstrating statistically significant dose dependent relationship in all parity (p<0.001) *table 3*.

Placenta, umbilical cord and maternal malaria parasitaemic clearance was achieved at 4th dose in secundigravidae and multigravidae and at 6th dose in primigravidae. Increasing number of doses of IPT-SP was significantly associated with reduction in LBW (P=0.001), symptomatic maternal malaria episode (p=0.028) and maternal anaemia in 3rd trimester (p=0.001) and at delivery (p=0.001) but non-significant reduction in preterm delivery (p=0.100). (*table 4a and 4b*).

There was no significant difference in the proportion of women reporting adverse drug reactions among the number of doses (p=0.395). (*table 4b*)

The uptake of IPT-SP within four weeks to delivery is significantly associated with lower risk of placenta, maternal and umbilical cord malaria parasitaemia, preterm delivery and LBW babies. (*table 5*)

Table 1: Socio-demographic Characteristics of Participants vs. number of doses of IPT-SP							
Characteristics	2 DOSES OF SP n (%)	3 DOSES OF SP n (%)	4 DOSES OF SP n (%)	5 DOSES OF SP n (%)	6 DOSES OF SP n (%)	Test statistics	P value
AGE: mean ± SD, years	29.24 ± 3.41	30.54 ± 3.89	30.61 ± 3.94	28.25 ± 2.21	25.50 ± 4.14	F=2.647	0.035*
Marital status							
Single	2 (2.2)	0 (0.0)	0(0.0)	3(18.8)	0(0.0)	LR _χ ² = 12.1	0.017*
Married	90(97.8)	54(100.0)	33(100.0)	13(81.2)	6(100.0)		
Tribe							
Yoruba	82(89.1)	47(87.0)	32(97.0)	16(100.0)	6(100.0)	LR _χ ² = 7.332	0.119
Igbo	10 (10.9)	7 (13.0)	1 (3.0)	0 (0.00)	0 (0.0)		
Hausa	0	0	0	0	0		
Others	0	0	0	0	0		
Education;							
None	1.0(1.1)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	LR _χ ² = 27.856	0.033*
Primary	5(5.4)	5(9.3)	0(0.0)	0(0.0)	0(0.0)		
Secondary	40(43.5)	16(29.6)	4(12.1)	3(18.8)	2(33.3)		
Tertiary	30(17.4)	26(13.0)	21(24.2)	8(31.3)	2(33.3)		
Undergraduate	16(32.6)	7(48.1)	8(63.6)	5(50.0)	2(33.3)	LR _χ ² = 25.745	
Occupation							
Skilled	22 (23.9)	24 (44.4)	18(54.5)	5 (31.3)	1 (16.7)		
Semiskilled	8 (8.7)	2(3.7)	3(9.1)	3(18.8)	1(16.7)		
Unskilled	38(41.3)	17(31.5)	4(12.1)	3(18.8)	2(33.3)		
Housewife	7 (7.6)	4(7.4)	0(0.0)	1(6.3)	0(0.0)		
Undergraduate	17(18.5)	7(13.0)	8(24.2)	4(25.0)	2(33.3)		
Religion							
Christianity	61(66.3)	37(68.5)	23(69.7)	9(56.3)	2(33.3)	LR _χ ² = 3.661	0.454
Islam	31(33.7)	17(31.5)	10(30.3)	7(43.8)	4(66.7)		
Traditional	0	0	0	0	0		

Table 2: Gravidity and Events in index pregnancy among the studied participants							
Characteristics	2DOSES OF SP n (%)	3DOSES OF SP n (%)	4DOSES OF SP n (%)	5 DOSES OF SP n (%)	6DOSES OF SP n (%)	Test statistics	P value
Gravidity							
All	92(45.8)	54(26.9)	33(16.4)	16(8.0)	6(3.0)	LRχ ² = 18.791	0.016*
Primigravidae	37(43.5)	14(16.5)	18(21.2)	11(12.9)	5(5.9)		
Secundigravidae	25(48.1)	19(36.5)	6(11.6)	2(3.8)	0(0.0)		
Multigravidae	30(46.8)	21(32.8)	9(14.1)	3(4.7)	1(1.6)		
G. A at booking							
mean ± SD, Weeks	23.46 ± 4.99	21.89 ± 4.24	20.73 ± 2.44	18.19 ± 2.76	16.17 ± 2.14	F=9.473	0.001*
No of ANC visits mean ± SD							
	4.11 ± 1.15	5.83 ± 1.02	7.39 ± 0.90	8.06 ± 0.68	8.50 ± 0.55	F=107.162	0.001*
Medical condition in pregnancy							
	16(17.4)	3(5.6)	4(12.1)	2(12.5)	0(0.0)	LRχ ² = 6.355	0.174
ITN Use							
YES	42(45.7)	26 (48.1)	13 (39.4)	5 (31.3)	4 (66.7)	LRχ ² = 3.054	0.549
NO	50(54.3)	28 (51.9)	20 (60.6)	11 (68.8)	2 (33.3)		

Conclusion: Four or more doses of IPT with SP was considerably more effective in reducing malaria parasitaemia, symptomatic malaria, maternal anaemia, low birth weight and premature delivery than 2-dose regimen even in this area with low SP resistance and high seasonal malaria and the extra dose of SP was well tolerated. The uptake of IPT-SP within four weeks to delivery is associated with reduced parasitaemia and prevention of anaemia, preterm delivery and LBW babies.

Recommendation: Pregnant women should be encouraged to receive four or more doses of IPT-SP in pregnancy for optimal prevention of malaria in pregnancy and Uptake of IPT-SP within four weeks to delivery should be encouraged.

Table 4: Secondary Outcomes vs. the number of doses of IPT-SP taken by study participants							
Characteristics	2 DOSES OF SP n (%)	3 DOSES OF SP n (%)	4 DOSES OF SP n (%)	5 DOSES OF SP n (%)	6 DOSES OF SP n (%)	Chi square/ F-Test	P value
Maternal PCV (32-36wks)							
Mean PCV ± SD	32.05 ± 2.81	32.74 ± 2.10	33.73 ± 1.07	33.50	33.17 ± 1.60	F= 3.861	0.005*
Mild Anaemia							
a. All	19(20.7)	2(3.7)	0(0.0)		0(0.0)	LRχ ² = 23.772	0.001*
b. Primigravidae	11(23.7)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	20.462	0.001*
c. Secundigravidae	3(12.0)	1(5.3)	0(0.0)	0(0.0)	0(0.0)	2.022	0.568
d. Multigravidae	5(16.7)	1(4.8)	0(0.0)	0(0.0)	0(0.0)	4.750	0.314
Maternal PCV at delivery							
Mean PCV ± SD	32.64 ± 2.87	33.52 ± 2.60	33.91 ± 2.49	33.81 ± 1.72	33.83 ± 1.17	F=14.79	0.077
Mild Anaemia							
a. All	11(12.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	LRχ ² = 17.951	0.001*
b. Primigravidae	6(16.2)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	10.577	0.032*
c. Secundigravidae	4(16.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	6.220	0.101
d. Multigravidae	1(3.3)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1.533	0.821
Symptomatic Malaria Episodes							
a) All	11(12.0)	4(7.4)	0(0.0)	0(0.0)	0(0.0)	10.837	0.028
b) Primigravidae	6(16.2)	1(7.1)	0(0.0)	0(0.0)	0(0.0)	8.357	0.079
c) Secundigravidae	2(8.0)	1(5.3)	0(0.0)	0(0.0)	0(0.0)	1.165	0.761
d) Multigravidae	3(10.0)	2(9.5)	0(0.0)	0(0.0)	0(0.0)	2.380	0.666

Table 4 b: Secondary Outcomes vs. the number of doses of IPT-SP taken by study participants								
Preterm Delivery								
a. All	7(7.6)	1(1.9)	0(0.0)	0(0.0)	0(0.0)	LRχ ² = 7.784	0.100	
b. Primigravidae	3(8.1)	1(7.1)	0(0.0)	0(0.0)	0(0.0)	4.231	0.376	
c. Secundigravidae	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	-----	-----	
d. Multigravidae	4(13.3)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	6.365	0.174	
Mean Birth Weight ± SD, kg	3.02 ±0.54	3.18 ±0.38	3.13 ±0.25	3.06 ±0.33	2.93 ±0.15	F=1.326	0.262	
Low Birth weight(<2.5kg)						LRχ ² = 19.080	0.001*	
a. All	16(17.4)	2(3.7)	0(0.0)	0(0.0)	0(0.0)	11.591	0.021	
b. Primigravidae	8(21.6)	1(7.1)	0(0.0)	0(0.0)	0(0.0)	6.220	0.101	
c. Secundigravidae	4(16.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	3.492	0.479	
d. Multigravidae	4(13.3)	1(4.8)	0(0.0)	0(0.0)	0(0.0)			
Maternal adverse drug reaction								
Minor						LRχ ² = 4.244	0.374	
a) YES	9(9.8)	2(3.7)	1(3.0)	2(12.5)	1(16.7)			
b) NO	83(90.2)	52(96.3)	32(97.0)	14(87.5)	5(83.3)			