ASSESSMENT OF IMPLEMENTATION OF INTERMITTENT PRESUMPTIVE TREATMENT (IPT) USING SULFADOXINE/PYRIMETHAMINE (SP) FOR MALARIA CONTROL IN PREGNANCY IN PANGANI DISTRICT, TANZANIA

BY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH OF THE UNIVERSITY OF DAR ES SALAAM



2004

CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by the University of Dar es Salaam a dissertation titled **"ASSESSMENT OF IMPLEMENTATION OF INTERMITTENT PRESUMPTIVE TREATMENT (IPT) USING SULFADOXINE/PYRIMETHAMINE (SP) FOR MALARIA CONTROL IN PREGNANCY IN PANGANI DISTRICT, TANZANIA "** in partial fulfillment of the requirements for the degree of Master of Public Health.

Supervisor's Signature .....

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Date 19/10/04

DECLARATION

I hereby solemnly declare that this dissertation is my original work and that neither whole nor parts of the dissertation have ever been submitted for a diploma or degree in any other University in partial fulfillment of the requirements for the degree of Master of Public Health in the University of Dar es Salaam.

Candidate's signature: ----------

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DEDICATION

This dissertation is dedicated to my beloved parents
and my beloved husband, **AHMED**.

ABSTRACT

A cross sectional study was conducted between May and June 2004 in Pangani District. The aim of the study was to assess the implementation of intermittent presumptive treatment using sulfadoxine/pyrimethamine (IPT) during pregnancy. The implementation was assessed in terms of coverage of IPT using SP in pregnant women, pregnant women awareness on IPT and health workers implementation to the national malaria control guidelines regarding IPT strategy using SP in pregnancy.

The study comprised of 316 pregnant women attended antenatal clinic and health workers involved in care of pregnant women at antenatal clinics. Structured questionnaires were used to collect information from both health workers and pregnant women.

The study has found that about 63.3% of pregnant women interviewed received at least one dose of SP for IPT. The uptake of second dose of SP for IPT is 30.5%. Irregular supply of water mentioned by health workers (70.8%), refusal of sharing cups (66.7%) and belief of taking drug on empty stomach (92.1%) by pregnant women were the barriers of implementing the DOT practice of IPT with SP.

About 59% of pregnant women were found to be aware of IPT and vast majority of them (96.3%) knew SP was the drug for IPT. However the majority (80%) had little awareness on the benefit of taking SP for IPT during pregnancy.

Lack of standard guidelines for implementing the IPT strategy with SP in some of health facilities, inadequate orientation to IPT policy using SP to health workers and inaccurate interpretation of SP dose schedules for IPT were the deficiencies found in the study area.

There is a need for training health workers on IPT strategy using SP and conducting IEC campaign on IPT to improve awareness and create demands for IPT with SP in pregnant women.

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ABBREVIATIONS

ANC	Antenatal Clinic
AIDS	Acquired Immune Deficiency Syndrome
CHMT	Council Health Management Team
DOT	Directly Observed Treatment
FANC	Focused Antenatal Care
HIV	Human Immunodeficiency Virus
IEC	Information Education Communication
IPT	Intermittent Presumptive Treatment
ITNs	Insecticide Treated Bednets
MCH	Maternal and Child Health
MOH	Ministry of Health
NGO	Non Governmental Organization
SP	Sulfadoxine/Pyrimethamine
STDs	Sexually Transmitted Diseases
USAID	United States Agency for International Development
WHO	World Health Organization

CHAPTER ONE

1.0 INTRODUCTION

1.1 Global Overview

Malaria is the major public health problem in the world and kills more people than any other communicable disease. Its prevalence worldwide is estimated to be in the order of 300 – 500 million clinical cases each year, about 80% of cases occur in Africa (WHO, 2003). The worldwide mortality due to Malaria is estimated to be over one million deaths each year, about 90% of all malaria deaths occur in Africa South of the Sahara. This is because the majority of the infections in Africa are caused by *Plasmodium falciparum*, the most dangerous of the four human malaria parasites. It is also because the most effective malaria vector, the mosquito *Anopheles gambiae,* is the most wide spread in Africa and the most difficult to control (WHO, 2003).

1.2 Malaria Transmission

Malaria is caused by four species of Plasmodium; *Plasmodium falciparum, P.ovale, P.vivax* and *P. malariae*. Among those, *Plasmodium falciparum* accounts for majority of the infections and is fatal. Increased risk of disease is linked with changes in global climatic conditions, agriculture and irrigation projects, mining activities, migration, drug resistance and road construction. All these promote wide spread of malaria and make control measures difficult.

1.3 Malaria Situation in Tanzania

Malaria is endemic in almost all parts of Tanzania and ranks number one in terms of mortality and morbidity. *Plasmodium falciparum* malaria accounts for over 30% of the national disease burden with estimated number of malaria cases ranging between 14 and 18 million and between 100,000 and 250,000 deaths per year, (MOH, 2002). The population groups most vulnerable to malaria are children under five years of age and pregnant women due to low and decreased immunity respectively.

1.4 Burden of Malaria in Pregnancy

Malaria infection during pregnancy is a major public health problem in tropical and subtropical regions throughout the world. In most endemic areas of Africa pregnant women are the main adult risk group for malaria (WHO, 2003). The populations at risk of the adverse consequences of malaria in pregnancy include, women with low parity women infected with human immunodeficiency virus, pregnancy during the high malaria transmission season and the use of a malaria drug that is suboptimally efficacious (Steketee *et al.*, 1996).

Plasmodium falciparum infection carries high morbidity and mortality for the fetus and the mother especially during the first and second pregnancies. It causes about 3%– 15% of severe anemia in pregnant women and up to 10,000 malaria related deaths per year. It accounts for about 30% of preventable low birth weight in newborns and contributes 3 –8% of infant mortality which is about 75,000 deaths per year (WHO, 2000), and up to 60% maternal malaria cases and spontaneous abortions are reported (Irshad, 2002).

In Tanzania malaria accounts for 20% of all maternal deaths each year (MOH, 2002). Complications due to *Plasmodium falciparum* malaria in pregnancy being more severe, the mortality is doubled (13%) compared to non-pregnant women (6.5%). Acute pulmonary edema and hypoglycemia are common complications in pregnancy, jaundice and altered level of consciousness may also occur (Kakkilaya, 2002), congenital transmission of malaria may occur, though uncommon, affecting 0.8% of all infants born in Dar es Salaam (Mwaikambo and Mclarty, 1985). During pregnancy malaria tends to be more atypical in presentation. This could be due to the hormonal, immunological, and hematological changes of pregnancy. Parasitemia tends to be 10 times higher as a result; the complications from *Plasmodium falciparum malaria* are more common in pregnant compared to non- pregnant women (Kakkilaya, 2002).

Malaria during pregnancy can be prevented and reduced with appropriate low cost interventions by the use of ITN's and appropriate chemoprohpylaxis, (JHPIEGO, 2002). Case management is less effective as preventive strategy particularly in endemic areas because so many cases are asymptomatic, however case management is always needed as part of control program, (Monica, 2000). The IPT strategy is one of the four plans African countries undertook to implement to halve the number of malaria deaths by 2010.

Sulfadoxine/Pyrimethamine (SP) is more likely to have the best overall effectiveness in preventing adverse outcomes associated with malaria in pregnancy. In a randomized control placebo trial revealed that IPT using SP is an effective and practicable strategy to decrease the risk of severe malaria in primigravidae and low birth weight in newborns in high transmission areas (Schulman *et al.*, 1999).

The widespread and high rates of resistance of malaria parasites to chloroquine prompted the MOH to introduce sulfadoxine/pyrimethamine (SP) to replace chloroquine (MOH/National Malaria Guidelines, 2000). The National policy for Malaria Prevention in Pregnancy recommends that "All pregnant women should receive full observed treatment dose of SP at the antenatal clinic twice during the course of their pregnancy, one dose administered during the second trimester and second dose administered in the third trimester of pregnancy as Intermittent Presumptive Treatment under direct observation of health workers (MOH, 2000). This is done regardless of physical signs of the disease because malaria parasites in pregnant women can hide in the placenta and thus often escape the finger prick method of diagnosis. With intermittent presumptive treatment the aim is to clear the placental parasite during the period of maximum fetal growth (24 – 36 weeks) and to clear peripheral parasitemia allowing hematological recovery (MOH, 2000).

Tanzania is a signatory to the Harare Declaration 1997 and Abuja Declaration 2000, both addressing malaria controls in Africa. Following the Abuja target that 60% of

pregnant women will use IPT/SP in the second and third trimester by the year 2005. The achievement of the Abuja target of 60% coverage by year 2005 will require more effective methods to improve delivery and compliance with recommended regimen.

In year 2002, USAID initiated a program under Maternal and Neonatal Health Program to revise the national guidelines for treating malaria during pregnancy and to strengthen health services for pregnant women. Working in collaboration with the Ministry of Health, USAID offered assistance to develop new guidelines. The program uses the platform of Focused Antenatal Care (FANC) a comprehensive antenatal care approach for pregnant women that provide service in early detection and management of diseases including malaria and syphilis, counseling on health promotion, birth preparedness, complication readiness and individualized birth planning. The new FANC guidelines include practice of IPT using SP (JHPIEGO, 2002)

1.6 Statement of the Problem and the Rationale of the Study

Malaria in pregnancy poses substantial risks to the mother, the fetus and the newborn. More than 30 million women in Africa become pregnant each year and this situation can have serious negative impact on pregnant women in sub-Saharan Africa (WHO, 2000). In Malaria endemic areas, malaria is the commonest cause of anemia among pregnant women and also causes abortion and can lead to intrauterine fetal death in advanced pregnancy. Furthermore, placental malaria parasitemia is a frequent cause of low birth weight and is associated with increased neonatal death. The prevalence of malaria in pregnancy is about 63% in high transmission regions of Tanzania (Lipyoga, 1995).

The Ministry of Health and other stakeholders in health approached this problem by instituting the policy guideline on routine Intermittent Presumptive Treatment using Sulfadoxine/Pyrimethamine (IPT/SP) in pregnant women attending antenatal clinics at all levels of the health care delivery system. Since more than two thirds of pregnant women are attending antenatal clinic, it was expected that by providing IPT/SP as directly observed treatment (DOT) at antenatal clinics, the uptake would be high. Despite high antenatal attendance (80%), the uptake of SP for IPT is still very low 29% (MOH, 2002) and the reasons have not been documented. This intervention, if implemented properly, has been reported to reduce the risk of maternal anemia and low birth weight in newborns by reducing the risk of placental malaria parasitemia (Schultz *et al.*, 1994).

The aim of this study was to assess the implementation of IPT policy using SP drug and to identify factors that could be the barriers to the implementation of Intermittent Presumptive Treatment using Sulfadoxine/Pyrimethamine in pregnant women attending antenatal clinics. The results from this study would be used to improve IPT coverage and thus contribute significantly towards the reduction of maternal and infant mortality.

1.7 RESEARCH OBJECTIVES

1.7.1 BROAD OBJECTIVE

The broad objective was to assess implementation of intermittent presumptive treatment using sulfadoxine/pyrimethamine for malaria control in pregnancy.

1.7.2 SPECIFIC OBJECTIVES

These were:

1. To determine the proportion of pregnant women who received SP dose for IPT at antenatal clinic (ANC).
2. To determine the reasons why pregnant women did not receive SP drug for IPT at ANC.
3. To assess pregnant women awareness on IPT using SP during pregnancy.
4. To assess the health workers implementation to national malaria control guidelines regarding practice of IPT using SP.

CHAPTER TWO

2. 0 REVIEW OF LITERATURE

Antenatal clinics provide an avenue for interventions that promote maternal and infant health. Timely antenatal clinic attendance is the key for delivering the prevention package to pregnant women. About 40% of pregnant women from Africa present for the first time to antenatal clinics in the second trimester of pregnancy, and 25% come for the first time in third trimester. This means that at least the first dose of SP for IPT could be given in time to most pregnant women (WHO, 2003).

Studies conducted in Malawi indicate that the proportion of women receiving at least one dose of SP for IPT during pregnancy is relatively high 67% – 92.7%, whereas the proportion of those receiving the second dose is much lower 29%- 39% (Rogerson *et al.*, 2000;Timothy *et al.*, 2004). In Kenya the uptake of SP for IPT in pregnant women at ANC was reported to be 23.7% for two doses of SP and 43.4% for one SP dose (Van eijk *et al.,* 2004).

Confusion by health workers about timing and spacing of SP doses and their over strict adherence to the timetable of SP doses has been reported as the major barrier to the administration of SP for IPT in Kenya and Malawi (Verhoeff *et al.*, 1998). General lack of awareness among health workers that SP drugs are safe during pregnancy results

in reluctance to administer SP (Rogerson *et al.*, 2000). Some still believe that chloroquine is more effective than SP (Laevens, 2002).

Successful implementation of IPT using SP in pregnancy depends largely on the quality of antenatal services. Understaffing at antenatal clinics has been acknowledged as a major problem affecting the quality of antenatal services (UNICEF, 1999). Providers are usually overworked resulting in poor quality of care and individual counseling and long waiting time for pregnant women (WHO, 2000).

Although most ANC staff know the need to perform DOT for IPT using SP drug, its implementation faces some constraints. In Malawi it has been observed that only 56.6% of the antenatal women were observed taking SP at the clinic (Laevens, 2002). The main constraints affecting the implementation of DOT are lack of water supply and cups at antenatal clinics together with the belief by many health workers and pregnant women that SP should not be taken on an empty stomach (Rogerson *et al.*, 2000). Belief that SP drug cause abortion, low purchasing power of SP drug and nomadic life style are major constraints in implementing IPT policy in Somalia (Irashd, 2002).

Sulfadoxine/Pyrimethamine (SP) drug shortages do occasionally occur and thus when stocks of SP are low, the practice of IPT using SP cannot be sustained as health workers give priority to symptomatic patients. Failure to integrate the IPT policy using SP into the private sector is a threat to its implementation. In Kenya and Malawi, it was

reported that SP for IPT in pregnancy is provided free at the government health facilities. On the other hand, health facilities which are privately owned charge a fee for SP (Laeveans, 2002). This could also explain why the uptake of SP for IPT in pregnancy is low.

A study conducted in Kenya has revealed that, during the era of chloroquine few pregnant women were actually using it partly because of the fear of abortion. After the malaria chemoprophylaxis policy changed to SP drug provided as IPT, pregnant women still do not seem to be convinced about the safety and value of SP. Several studies have been conducted that proved the safety and efficacy of SP for IPT in pregnancy, (Schultz *et al.*, 1996; Parise, 1998; Rogerson *et al.*, 2000; Woelf *et al.*, 2001).

Intermittent presumptive treatment is a strategy for reducing maternal and infants' mortality due to malaria by reducing incidence of severe malaria, maternal anemia related to malaria, spontaneous abortion, and the risk of low birth weight in newborn babies. Its protocol in providing SP for IPT at antenatal clinic includes;

- Determine if quickening has occurred
- Determine gestational age
- Inquire about the history of severe skin reactions
- Inquire about the use of SP in the last month
- Provide three tablets of SP with clean water in a cup
- Observe the patient swallowing all three tablets

- Record SP on antenatal card and the clinic record register
- Explain to the patient to return at the next scheduled visit or earlier if she is not feeling well.
- Ask about side effects from previous dose before giving the next dose, which should not be less than four weeks from the last dose.

According to National Malaria Guidelines of 2000, the first dose of SP for IPT should be given in week 20 and the second dose in week 30. If antenatal clinic attendance is irregular, the first IPT dose may be given any time between the 20th and 28th week and the second IPT dose at any time between the 30th and 36th week. Pregnant women who are known to have an allergy to sulfa drugs (most commonly as skin rash) should not receive SP for IPT (MOH, 2000). Moreover, intermittent presumptive treatment should not be considered as chemotherapy. The women can still be infected with malaria after taking SP for IPT (MOH, 2000). For pregnant women to enjoy better health, it is advised that they should access antenatal services at the beginning of pregnancy, and receive proper health education on measures for malaria prevention with emphasis of sleeping under insecticide treated bed nets at night and routine use of intermittent presumptive treatment with SP (MOH, 2000).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Description of the study area

Pangani is the smallest District among the seven Districts of Tanga region. It is located in the southern part of the Tanga Region extending from 5^0 15' and 5^0 50' south of the equator, and between 38^0 35' and 39^0 00' east of Greenwich meridian. The district is bordered by Muheza district to the North, Indian Ocean to the East, Bagamoyo district to the South and Handeni district to West. Pangani River divides the district, which pours its water into the Indian Ocean.

Administratively, the district is divided into four Divisions, 13 Wards and 33 Villages. Available demographic data as projected from the 2002 Census up to the year 2004 indicates that the district had 44,901 people from whom 23,349 are males and 21,552 are females, and annual growth rate of 1.8. Ethnic groups comprise the main tribes of Zigua, Bondei, Digo and Makonde.

The district experiences three rain seasons annually, the long rain seasons start from March to June, short rain seasons occur in October to December, and occasional shower seasonal rains between month of June and September. The average rainfall is about 600 to 1400mm per annum. The district experiences an average temperature of $24c^0$.The main economic activities include agriculture of small-scale production (such as maize,

cassava, and cashew nuts) and sisal as large-scale production. Livestock keeping, bee keeping and small-scale fishing is also practiced in the district.

3.2 The district health care delivery

Health care is provided by both modern and traditional sectors. The modern health sector consists of thirteen (13) public owned health facilities and two privately owned (NGO) health facilities. There is one hospital owned by government, which is the district hospital, one rural health centre (at Mwera) and eleven dispensaries. Amboni Sisal Estate owns the two private dispensaries. These do not conduct antenatal care clinics. Top ten diseases of public health importance include malaria, acute respiratory infections, anemia, pneumonia, diarrhea diseases, worm infections, skin diseases, eye diseases, HIV/AIDS and sexually transmitted diseases (STDs).

3.3 Study design

This study was a cross-sectional study assessing the implementation of IPT policy using SP in pregnancy. Quantitative and qualitative methods were employed. The qualitative and quantitative findings were used to corroborate different issues and to draw inferences.

3.4 Study population

The study population consisted of pregnant women attending antenatal care clinics, nurses and clinicians attending patients at the antenatal clinics during the study period.

3.5 Sample size for pregnant women

The sample size was calculated using the formula

$$n = \frac{Z^2 P (I00 - P)}{E^2}$$ Where:

n = the required minimum sample size

Z = is the standard normal deviation corresponding to 95% confidence interval = 1.96

P = is the proportion of pregnant women who received SP for IPT taken to be 29% (MOH, 2002).

E = is the margin of error on P estimated to be 5%.

Hence, $$n = \frac{1.96^2 \times 29 (100 - 29)}{5^2}$$

$$n = \frac{7,909.8544}{25}$$

$$n = 316.394$$

Therefore the required minimum sample size was 316.

3.6 Sample size and sampling method for health workers

The District Hospital was purposively selected and five other health facilities were selected randomly for the study from the list of all health facilities (12) that conduct antenatal care clinic in the district. The health facilities selected were Mwera health centre, Boza dispensary, Kimanga dispensary, Madanga dispensary and Stahabu dispensary. Four health workers from the district hospital and from each of the selected health facility were recruited into the study making a sample size of 24 health workers.

Random selection of health workers was carried out in three (3) health facilities, which had more than four health workers. The other three (3) health facilities all health workers were interviewed as only four health workers were found during the study period.

3.7 Sampling method for pregnant women

MCH cards of pregnant women who attended antenatal clinic were routinely collected by health workers before ANC services began each day. Research assistants obtained the list of all pregnant women through observation of their MCH cards. When the services were about to begin, women were called by their names one by one and asked to pick up a folded piece of paper and showed to a researcher. When the word "YES" appeared in that piece of paper the woman was selected into the study and then asked for her willingness to participate. For those women who picked up piece of paper written "NO" were not recruited into the study. Women were then continuing receiving services and for those who accepted to participate were told to return back to researcher for interview. Ten (10) pregnant women from the district hospital and five (5) from one of the selected health facility were randomly selected and interviewed per day at antenatal clinics.

3.8 Recruitment and training of research assistants

Two (2) research assistants were recruited and trained for one day. The training aimed at orienting them to the study and providing them with necessary skills for data collection.

3.9 Data collection instruments

3.9.1 Pregnant women

A structured questionnaire in Swahili language was used to collect the information from pregnant women and it had four parts. Part one dealt with demographic characteristics of pregnant women. Part two was concerned with awareness of malaria by pregnant women. Part three assessed the pregnant women awareness on IPT policy using SP drug during pregnancy and part four determined whether pregnant women received or did not receive SP drug for IPT and in the latter case, the reasons for not receiving SP.

3.9.2 Health workers

A structured questionnaire was used to determine the actual practice of IPT implementation using SP drug by health workers. The data then was compared with standard national guidelines.

3.10 Pre-testing of the research instrument

The questionnaire was pre-tested at Mkuranga District Hospital, to find out whether the coding of the questions was clear and sequence of questions was logical. After pre-testing, some modification of the questions was done before embarking on the actual fieldwork.

3.11 Data collection procedure

3.11.1 Structured exit interview with pregnant women

Research assistants arrived at the clinic before the opening hours. Interview with pregnant women was carried out after they had received the services and informed consent obtained. Pregnant women were interviewed privately and the answers were recorded on a questionnaire. A total of 316 pregnant women who attended antenatal clinics during the study period were interviewed

3.11.2. Structured interview with health workers

Researcher obtained informed consent and conducted interview with health workers prior to closing hours at antenatal clinics. Health workers were privately interviewed and the responses were recorded on the questionnaires. Twenty-four (24) health workers from selected health facilities who attended patients at antenatal clinics during the study period were interviewed.

3.12 Data analysis

After the fieldwork, the responses for open-ended questions were categorized and coded. Data cleaning and analysis were done using Epi-Info computer program.

3.13 Ethical consideration

The nature of the research was thoroughly explained to participants by researcher. In particular they were informed that this research was an academic requirement for the Masters Degree in Public Health and that the results of the study would be used for improving the malaria control strategies in pregnancy in the district. Each participant was assured that the responses would be kept confidential and the names would not appear in any of the documents and which other people than the researcher would not access. A participant who refused to be interviewed was not forced to do so and she got all the services she was supposed to get at the ANC clinic.

3.14 Limitation of the study

Presence of the researcher during patient-exit interview might have influenced the responses from the respondents leading to bias.

3.15 Definition of terms

Primigravida	-	a pregnant woman who is having her first pregnancy
Secondgravida	-	a pregnant woman carrying her second pregnancy
Clinician	-	a health personnel trained in the human medical field to manage an individual's health problem
Multigravidae	-	Pregnant women who had three or more pregnancy
First trimester	-	Pregnancy below twelve (12) weeks of gestation
Second trimester	-	Pregnancy between 13 and 24 weeks of gestation
Third trimester	-	Pregnancy between 25 and 36 weeks of gestation
Sulfadoxine/Pyrimethamine		is the first line drug for the treatment of uncomplicated malaria



CHAPTER FOUR

RESULTS

A total of 316 pregnant women who attended antenatal care clinics participated in the study. Their demographic characteristics are summarized as shown in Table 1 below:

Table 1: Demographic characteristics of the study population

Variable	Number of pregnant women (n= 316)	Percent
Age group (years)		
14 – 19	42	13.3
20 – 25	156	49.4
26 – 31	77	24.4
32 – 37	41	12.9
Gravidity		
Primigravida	109	34.5
Secondgravida	84	26.6
Multigravida	123	38.9
Marital status		
Married	194	61.4
Not married	122	38.6
Education level		
No formal education	47	14.9
Primary education	269	85.1
Gestation age at time of interview		
First trimester	3	1.0
Second trimester	98	31.0
Third trimester	215	68.0

The mean maternal age at the time of interview was 26.5 years, with absolute range of 14 to 37 years and median of 25 years. The majority of respondents were of age group of 20 to 25 years (49.4%). 38.9% of the pregnant women interviewed were Multigravidae, 61.5% were married and 68% were in the third trimester at the time of interview. Majority of them (85.1%) had primary education (table1).

Table 2: Antenatal clinic visit and gestational age at first ANC visit.

Variable	Number of pregnant women n = 316	Percent
Antenatal visits		
Up to 2	210	**66.5**
More than 2	106	**33.5**
Trimester at first ANC visit		
First trimester	12	**3.8**
Second trimester	210	**66.5**
Third trimester	94	**29.7**

Table 2 shows that 66.5% of pregnant women interviewed had made two antenatal clinic visits, while 33.5% had attended more than twice. Majority of pregnant women interviewed (66.5%) had their first antenatal visit in the second trimester, while 29.7% had their first visit in the third trimester and only 3.8% attended in the first trimester.

Proportion of pregnant women who received SP for IPT at antenatal clinics.

Attempt was made to establish whether a pregnant woman received SP dose for IPT by looking at their MCH card. The distribution of recipient and non-recipient of SP for IPT by antenatal visit is shown in Table 3.

Table 3: Distribution of SP recipient and non-recipient by antenatal visits.

Antenatal visits	Recipient		Non-recipient		Total
	No.	(%)	No.	(%)	
Up to 2	120	(57.0)	90	(43.0)	**210**
More than 2	80	(75.5)	26	(24.5)	**106**
Total	**200**	**(63.3)**	**116**	**(36.7)**	**316**

Table 3 indicates that 63.3% of pregnant women interviewed received SP for IPT while 36.7% did not. Majority of them (75.5%) who received SP for IPT had made more than two antenatal visits.

Table 4: Number of SP doses that pregnant women received for IPT by antenatal visits.

Antenatal visits	One dose recipient		Two dose recipient		Total
	No	(%)	No	(%)	
Up to 2	78	(74.3)	27	(25.7)	**105**
More than 2	61	(64.2)	34	(35.8)	**95**
Total	**139**	**(69.5)**	**61**	**(30.5)**	**200**

Table 4 indicates that for the majority of women, the MCH cards showed that they had received only one SP dose for IPT (69.5%) while 30.5% had received the two recommended doses of SP during the pregnancy. 35.8% of pregnant women who received two doses of SP for IPT had made more than two antenatal clinic visits compared to 25.7% of those who made up to two visits.

MCH cards of 2.5% (5) of pregnant women showed that they had received the first SP dose for IPT at gestational age of 18th weeks and 5% (10) of them had received the second SP for IPT at the gestational age between 24th and 27th weeks.

Pregnant women who received SP for IPT were asked if they had swallowed SP tablets in the clinic or were given SP tablets to swallow at home. 68.5% (137) of them had swallowed SP tablets at the antenatal clinic, while 31.5% (63) of them took SP tablets to swallow at home. Pregnant women who did not swallow SP at antenatal clinic were asked to give reasons for not doing so. Table 5 shows the reasons given by some pregnant women for not swallowing the SP tablets in the clinic.

Table 5: Reasons given by some pregnant women for not swallowing SP in the clinics

Reasons	Responses (N = 63)	Percent
Did not want to share cups at antenatal clinics.	42	66.7
Can not take drug on empty stomach	58	92.1

Table 5 shows that 66.7% of pregnant women did not want to swallow SP tablets in the clinic because they did not want to share cups with others while 92.1% reported that they would not want to swallow the drug on an empty stomach .

Pregnant women who did not receive SP for IPT at the antenatal clinics, were asked for the reasons for not doing so. The responses are summarized in the table 6.

Table 6: Reasons for not taking SP for IPT at antenatal clinic

Reasons	Responses	Percent
SP not given to them at ANC	76	65.5
Pregnancy below 20 weeks	35	30.2
Previous history of SP reaction	5	4.3
Total	**116**	**100**

Majority of pregnant women (65.5%) who did not take SP doses for IPT at antenatal clinic, reported that they were not given the SP at the antenatal clinic. However, 30.2% had pregnancy below 20 weeks and 4.3% had previous history of SP allergy and these were the reasons for not taking SP for IPT. None of the pregnant women mentioned fear of SP side effects as the reason for not taking SP for IPT at antenatal clinics

Awareness of IPT using SP by pregnant women

Attempt was made to measure the extent to which pregnant women attending antenatal care clinics are aware of IPT using SP. 59.2% (187) of the pregnant women interviewed had heard about IPT, while 40.8% (129) of them had never heard of it. Pregnant women who had heard of IPT were asked about the drug used for IPT at antenatal clinics. The responses are summarized in table 7.

Table 7: Responses of pregnant women to drug used for IPT at antenatal clinics

Drug for IPT	Responses	Percent
SP	180	96.3
Other Drugs	5	2.7
Don't know	2	1.0
Total	**187**	**100**

Table 7 indicates that 96.3% of the pregnant women who had heard of IPT, mentioned SP as the antimalarial drug for IPT, while 2.75% of those who had heard of IPT mentioned drugs other than SP (Hematenics, i.e Folic Acid and Fersolate tablets) and 1% didn't know the drug used for IPT at antenatal clinics.

Table 8: Awareness of pregnant women on the number of SP doses for IPT.

SP doses	Responses	Percent
Two doses	79	43.9
Don't know	101	56.1
Total	**180**	**100**

Pregnant women who mentioned SP as the drug for IPT were asked about doses of SP provided as IPT at antenatal clinics. 43.9% of them mentioned two SP doses (table 8).

Table 9: Awareness of pregnant women on gestational age for IPT

Gestation age	Responses	Percent
5 and 7 months	37	20.6
Don't know	143	79.4
Total	**180**	**100**

Table 9 indicates that about one fifth (20.6%) of pregnant women who knew SP as the drug for IPT during pregnancy, mentioned five and seven months as the gestational age at which SP doses are provided to pregnant women at antenatal clinics.

Awareness of pregnant women on the benefits of IPT using SP during pregnancy. An attempt was made to assess if pregnant women who knew IPT using SP were aware of its advantages. The response distributions are summarized in the Table 10.

Table 10: Awareness on the benefits of IPT using SP.

Advantages	Responses	Percent
Reduce complication of malaria During and after pregnancy to the mother and the baby.	36	20.0
Don't know	41	22.8
Other	103	57.2
Total	**180**	**100**

Table 10 indicates that 20% of pregnant women mentioned reduction in complication of malaria during pregnancy to mother and fetus being the advantage of taking SP for IPT during pregnancy, while 57.2% mentioned the advantages unrelated to the use of SP for IPT in pregnant women and 2.8% did not even know what could be the benefits of taking SP for IPT.

Health workers survey

A total of 24 health workers participated in the study. Health workers were assessed on their understanding of IPT policy using SP and its implementation in accordance with Standard National Guidelines. The characteristics of health workers interviewed from different health facilities are shown in Table 11.

Table 11: Characteristics of Health Workers

Cadre of Health Workers	Male No	(%)	Female No	(%)	Total
Clinicians	4	(66.7)	2	(33.3)	**6 (25%)**
Nurses	2	(11.1)	16	(88.9)	**18 (75%)**
Total	**6**	**(25.0)**	**18**	**(75.0)**	**24 (100%)**

75% of health workers interviewed were nurses and 25% were clinicians. 75% of health workers interviewed were female while 25% were male. (Table 11).

54% (13) of health workers interviewed reported to have received orientation on IPT/SP strategy. Eight (8) of them (61.5%) reported to have been oriented through malaria case management training seminar and five (5) of them (38.5%) through training on Focused Antenatal Care.

Health workers were asked to show the guidelines they were using in implementing IPT strategy using SP drug at antenatal clinic. About 17% (4) of health workers showed the guideline provided during their training on Focused Antenatal Care (Focused Antenatal Care malaria and syphilis in pregnancy of July 2002). 50% (12) of health workers showed the wall chart of SP doses schedule for IPT from FANC guideline. 33% (8) of health workers from two health facilities failed to show the guidelines used for implementing IPT.

All health workers interviewed were aware of the number of SP doses for IPT to be provided. Health workers were asked to mention the gestational age for the first and second SP doses for IPT. Table 12 shows the responses for gestation age of SP doses for IPT.

Table 12: Responses for gestational age of SP doses for IPT

Gestational age (weeks)	Responses (n = 24)	Percent
First IPT/SP dose		
at 20	9	37.5
20 – 24	13	54.2
20 – 28	2	8.3
Second IPT/SP dose		
at 30	7	29.2
28 – 32	14	58.3
30 - 36	3	12.5

As shown in table 12, about 54.2% mentioned the interval of 20 – 24 weeks, while 37.5 % mentioned at 20 weeks and 8.3% mentioned interval of 20 – 28 weeks as the gestation age for the first dose of SP for IPT.. With regard to the second SP dose, majority (58.3%) mentioned the interval of 28 – 32 weeks, 29.2% mentioned at 30 weeks and 12.5% mentioned the interval of 30 – 36 weeks.

Health workers were asked to explain the SP dose schedule for IPT supposed to be given to pregnant women who presented at antenatal clinic for the first time after 28 weeks of gestation. The responses are summarized in Table 13.

Table 13: Responses of health workers on SP dose schedule for IPT for pregnant women after 28 weeks of gestation

IPT/SP doses	Responses	Percent
No SP dose will be given as she did not receive first dose.	10	41.7
If she comes before 32 weeks, only one dose of SP will be given.	10	41.7
One SP dose will be given if she comes before 36 weeks.	4	16.6

Table 13 indicates that 41.7% of health workers reported that they would provide one SP dose if the pregnant woman came before 32 weeks. 41.7% of them reported that they would not provide any SP dose and 16.6% of them explained that one SP dose would be given any time before 36 weeks to pregnant women who came to antenatal clinics after 28 weeks of gestation.

Health workers were asked to explain the barriers for administering SP for IPT at antenatal clinics. Table 14 below shows the responses of health workers for the constrains in providing SP for IPT.

Table 14: Constraints in providing SP for IPT at antenatal clinics

Constrain	Responses (n = 24)	Percent
Confusion of SP timetable for IPT with trimesters	9	37.5
Irregular water supply	17	70.8
SP dose schedules for IPT not clearly understood	10	41.7
Forgot to give them SP	8	33.3

37.5% of health workers interviewed admitted their confusion between SP timetable for IPT with the trimesters of pregnancy. Irregular supply of water to most of health facilities was

mentioned by 70.8% of the health workers as the barriers in providing SP for IPT. Tap water was observed in two health facilities, one health facility obtained water from the river and three health facilities obtain from wells. 33.3% explained that sometimes they unintentionally forgot to give SP to the pregnant women at antenatal clinic. 41.7% explained that the SP dose schedule for IPT was not clearly understood by them and that was constraint to SP administration at antenatal clinics (table 14).

CHAPTER FIVE

DISCUSSION

This study was conducted in the rural district of Pangani where malaria during pregnancy and maternal mortality is undoubtedly an important public health problem as in many other districts in the country. In recent years, the cornerstone for malaria prevention during pregnancy has been the provision of IPT using SP as directly observed treatment at antenatal clinics together with the use of ITNs by pregnant women. This study looked at implementation of IPT strategy using SP drug for malaria prevention in pregnancy.

IPT Coverage

In this study the proportion of pregnant women who received at least one dose of SP for IPT was found to be 63.3%. The proportion is relatively lower than that reported by Rogerson *et al.* (2000) and Van eijk *et al.* (2004). However the sampling methods for the study population were not similar. The figure is somewhat above that of the Abuja target of 60% coverage to be achieved by the year 2005. The relatively high proportion of pregnant women receiving the first dose of SP for IPT in this study implies its acceptance by women. However, the proportion of pregnant women who received the second dose was found to be low (30.5%). This could be attributed to the fact that most pregnant women made their first antenatal clinic visit quite late in the second trimester. Late presentation at antenatal clinics reduces the women's chances to receive the appropriate number of SP doses for IPT (Laevens, 2002).

Findings from this study indicate that three quarters (75%) of pregnant women who received at least one dose of SP for IPT had made more than two antenatal clinic visits. This could be due to the fact that the district has also been implementing the Focused Antenatal Care program that was being provided as antenatal package to improve antenatal clinic attendance. Seeking for the antenatal care, provide chances for provision of SP for IPT (Rogerson *et al*, 2000). Surprisingly, the proportion of those receiving the second SP dose for IPT was found to be even lower (36%) with more antenatal clinic visits. Lack of standard guidelines in some of the health facilities, inaccurate interpretation of SP dose schedule for IPT led to uneven implementation of strategy by health workers.

Pregnant women awareness on IPT strategy using SP

Pregnant women seemed to have fairly good knowledge of IPT strategy using SP. Findings indicate that more than half (59%) of pregnant women were aware of IPT strategy for malaria control during pregnancy. Majority of them (96%) knew that SP was the drug for IPT. This implies that antenatal clinics could be a potential source of health information in rural areas.

It is obvious that malaria poses a threat to women during pregnancy; hence its prevention is crucial. Pregnant women need to be informed about schedules and the benefit of taking SP for IPT during pregnancy. Only a few (21%) pregnant women correctly mentioned the gestation age for the first and second SP dose for IPT. The main

reasons for taking SP for IPT were correctly identified by only one fifth of the women. This implies that few discussions were conducted between health workers and pregnant women about schedules and the benefits of taking SP drug for IPT. Moreover other sources of health information like leaflets and booklets that were supposed to be displayed to women attending antenatal clinics were not seen in the selected health facilities during the study period. Only wall posters were seen in two of selected health facilities.

Directly Observed Treatment of SP for IPT

Women are made to take SP in clinic in the presence of health workers so as to improve adherence of women to SP regimen. This is only possible if the drugs for IPT, adequate and regular supplies of water are available. The reason for the majority of pregnant women (65.5%) who did not receive SP dose for IPT was that SP was not provided to them at the antenatal clinic. Majority of health workers mentioned irregular supply of water as a barrier to DOT practice. Similar problem was found in other studies, (Ashwood-Smith *et al,* 2002; Rogerson *et al*, 2000). Sources of water are not in the vicinity of health facilities, moreover fetching, boiling and storing of boiled water is cumbersome and time-consuming. When the stored water becomes insufficient procedure such as delivery and sterilization of equipments are given priority. This forced the health workers to postpone SP dose schedule without informing the pregnant women.

Few health workers (33.3%) reported forgetting provide SP for IPT sometimes because of the workload and inadequate orientation to newly employed health staff. Health workers did not report SP drug shortage as a constraint. Perhaps SP being the first line antimalarial drug in the treatment of uncomplicated malaria it is readily available in the district. Beliefs of taking drugs on empty stomach among pregnant women restrain health workers to provide SP for IPT under DOT, instead SP tablets are given to pregnant women to swallow at home. This reflects lack of basic knowledge of pharmacology within health workers and the pregnant women.

Lack of clear information on when to provide SP for IPT during pregnancy resulted in unsystematic follow up of SP dose schedules for IPT. In a small minority of pregnant women (3%) SP for IPT was provided before 20 weeks of pregnancy and for others (5%) second SP dose for IPT was given before 28 weeks.

CHAPTER SIX

6.1 CONCLUSIONS

i) The study has shown that the coverage of IPT using SP in pregnant women attending antenatal clinics is 63.3%. Uptake of second SP dose for IPT is low (30.5%).

ii) Irregular supply of water to health facilities, refusal of sharing cups and belief that taking SP on an empty stomach among pregnant women was dangerous, were found to be the barriers in implementing the DOT practice of IPT using SP.

iii) Awareness of pregnant women on IPT and the benefit of taking SP drug for IPT during pregnancy is poor.

iv) Standard guidelines for implementing the IPT strategy using SP were not distributed to all health facilities.

v) There was misinterpretation of SP dose schedule for IPT as per guidelines by health workers

vi) Some health workers were not oriented on IPT strategy using SP

6.2 RECOMMENDATIONS

Provided there is adequate supply of SP drug, implementation of IPT strategy using SP for malaria control during pregnancy will not face major constraints for long term sustainability. However, it is advisable that the CHMT;

i) Should plan for orientation seminar on IPT using SP drug for malaria control during pregnancy, for health workers currently involved in care of pregnant women at antenatal clinics.

ii) Should prepare brochure to be used as guidelines for implementing IPT strategy using SP and distributed to all health facilities

iii) Should develop IEC messages to increase women awareness and demand for IPT with SP.

iv) Monitoring implementation of IPT strategy with SP in pregnancy has to be part of routine supervision of health staff of antenatal clinics

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