



MALARIA IN PREGNANCY IN INDIA

Malaria is a major parasitic disease that affects millions of people every year the world over. Some 300-500 million people suffer from the disease each year and about 1 million lose their lives [1]. In general, more men than women are affected by malaria. But when pregnant women get malaria, this has serious consequences. This fact sheet presents information on the extent and consequences of malaria in pregnancy and recommended treatment regimens in India for malaria in pregnancy. It also draws attention to how gender –based inequalities may increase women's vulnerabilities. The fact sheet is aimed at those concerned with women's health and reproductive health, to facilitate informed action.

MALARIA IN PREGNANCY- SOME BASIC FACTS

A person is infected with malaria when a female anopheles mosquito that carries malaria parasites bites him/her. When the mosquito bites a person with malaria and sucks up blood, some of the parasites from the blood of the infected person get into the mosquito. Within 10-14 days the malaria parasites multiply and develop in the infected mosquito, and are mature to be passed on to another person. When the mosquito bites a healthy person, the malaria parasites enter into the blood of the healthy person. These parasites are transported to the victim's liver. They multiply there and re-enter the blood stream. The person infected by the mosquito bite will become sick with malaria usually within 7-21 days of being bitten. But symptoms can rarely appear even after several months [1].

There are four main species of malaria parasites. *Plasmodium falciparum* and *Plasmodium vivax* are the most common parasites affecting humans in India. *P. falciparum* causes the most severe form of malaria, although in recent years, *P. vivax* has also been found to cause severe infection.

Pregnancy is known to make women more attractive to mosquitoes. It also reduces women's immunity to malaria. This is especially the case in second and third trimesters of pregnancy. Pregnant women are therefore more likely to be infected by malaria than non-pregnant women and men, have more frequent episodes of malaria, suffer more serious forms of malaria and have a higher risk of complications. In case the pregnant woman is suffering from nutritional anaemia, this is compounded by malaria-induced anaemia, leading to severe anaemia with potentially life threatening complications which may result in maternal deaths [2]. Non-immune pregnant women are more likely to develop severe forms of malaria and are reported to have a 2-10 times higher risk of death than non-pregnant women with malaria [3].

When the parasites get into the placenta, the infected pregnant woman may not develop symptoms of malaria. The parasites then interfere with transfer of oxygen and nutrients from the

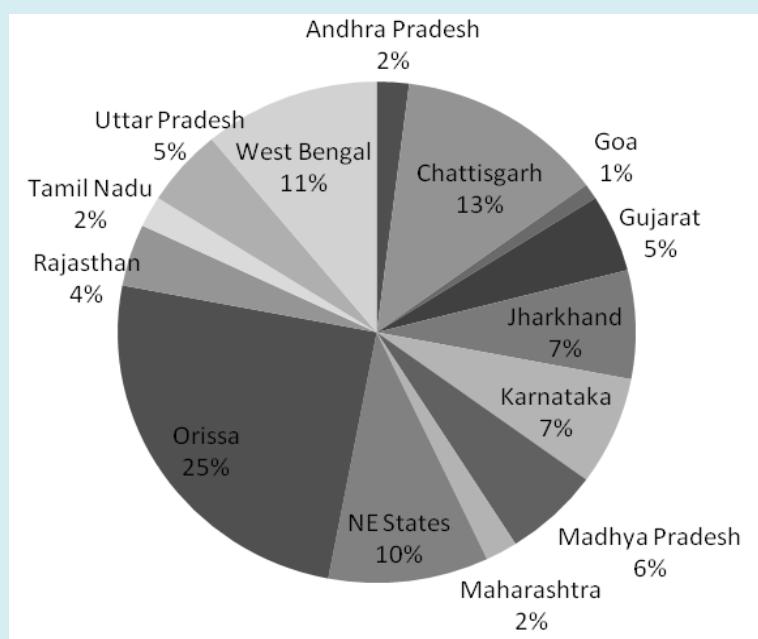
pregnant woman to the foetus. When this happens, there is increased risk of spontaneous abortion, pre-term birth or stillbirth or of giving birth to a low-birth weight baby.

MALARIA AND ITS TRANSMISSION IN INDIA DATA

The pattern of malaria transmission in India is called unstable transmission. Transmission is seasonal and is highest before the monsoon rains. Much of the population has not developed adequate immunity to malaria. This means that a majority of Indians are at risk of malaria infection and that all age groups are affected. This is very different from the situation in Africa where malaria transmission is high and stable, and where the majority of the population have acquired immunity to malaria and children are predominantly affected [4].

The reported burden of malaria in India is highest in Orissa which accounts for 25% of all malaria cases annually. Chhattisgarh accounts for 13% of all cases, West Bengal for 11%, North-Eastern states for 10%, Jharkhand and Karnataka for 7% of cases each [figure 1]

Malaria in India-contribution of different states



Source: [5]

STUDIES ON MALARIA IN PREGNANCY IN INDIA

Burden

There is limited information on the incidence of malaria in pregnancy in India, and of the health consequences to women. The NVBDCP does not collect any data on malaria in pregnant women, rendering the problem invisible [6].

Some estimates show that the burden of malaria in pregnancy may be very high in India. For example, the number of cases of malaria in pregnancy in the rural areas of undivided Madhya



Pradesh (including Chhattisgarh) has been estimated to be as high as 220,000 per year. The number of miscarriages and stillbirths in the same study were estimated to be 95,800 and maternal deaths, 1000 annually [7].

In a recent (2006-07) study carried out in antenatal clinics and delivery units in three sites in Jharkhand, 43 of 2382 women (1.8%) in the antenatal clinics were found positive for malaria when blood tests were performed. In the delivery units, 29 of 712 women (4.1%) were found to be infected, with the majority (2.4%) having placental infection. More than half (53.5%) of the infected women in antenatal clinics and 75% of women in delivery units were infected by *P. falciparum* [8].

Studies carried out in the 1990s in central India have found adverse pregnancy outcomes and maternal mortality to be much higher in pregnant women with symptoms and/or diagnosis of falciparum malaria [9-10].

An important finding in the Jharkhand study was that only about half the pregnant women (51.2%) diagnosed with malaria were symptomatic. This means that a large number of pregnant women infected but not showing symptoms may not receive any treatment or care [8].

Treatment regimens for uncomplicated malaria

When symptoms of malaria are present but there is no evidence of any vital organ being seriously affected, malaria is said to be 'uncomplicated'. According to the 2010 Guidelines for treatment of malaria issued by the government of India [11], the treatment regimens to be followed in pregnant women with uncomplicated malaria are as follows:

P. falciparum infection

If the woman is in her first trimester of pregnancy, she is to be treated with quinine. The dosage is Quinine 10 mg/kg of body weight, three times a day for 7 days [11].

It is important to note that Quinine can reduce Blood Sugar, so any woman taking Quinine must eat something before or immediately after the Quinine pills.

If the woman is her second or third trimester of pregnancy, she is to be treated with ACT or Artemisinin Combination Therapy. Artemisinin Combination Therapy consists of two drugs: Artesunate and Sulfadoxine –Pyrimethamine (SP) [11]. The dosage is given below.

Table 1. ACT oral regimen for p.falciparum infection in second and third trimesters of pregnancy

Drugs	Number of tablets		
	Day 1	Day 2	Day 3
Artesunate 50 mg	4	4	4
Sulfadoxine 500 mg+ Pyrimethamine 25 mg	3	0	0

Source: [11]



P. vivax infection

Table 2. Chloroquin oral regimen for p.vivax infection in pregnancy

Drugs	Number of tablets		
	Day 1	Day 2	Day 3
Chloroquine (10mg/kg)	4	4	2

Source: [11]

Points to bear in mind when using antimalarial drugs

- The first dose may be given under medical observation
- Taking drugs on an empty stomach should be avoided
- If the patient vomits within 30 minutes, the dose should be repeated
- If patient's condition does not improve after 48 hours or worsens, she should seek immediate medical attention

Treatment regimens for severe malaria

Symptoms of severe or complicated malaria include a history of high fever plus one or more of the following:

- Prostration (inability to sit), altered consciousness, lethargy
- Difficulty in breathing
- Severe anaemia
- Generalised convulsions/fits
- Inability to drink/vomiting
- Dark and/or limited production of urine [12]

Regimen for women in the first trimester of pregnancy

- Immediately on admission, Quinine is given intravenously. The dosage is 20mg quinine salt/kg of body weight
- After this, a lower dose of Quinine is given intravenously every 8 hours. The dosage is 10 mg quinine salt/kg of body weight
- As soon as the patient is able to take medicines orally, oral quinine is given. The dosage is 10mg quinine salt/kg of body weight 3 times a day for 7 days.
- Together with the oral quinine dose, another drug - clindamycin is given two times a day for 7 days. The dosage is 10 mg/kg bodyweight [11].

Regimen for women in the second and third trimester of pregnancy

- Immediately on admission, Artesunate is given intravenously or by injection. The dosage is 2.4 mg/kg of bodyweight .
- After 12 hours, the same dosage of Artesunate is given intravenously or by injection. The third dose with the same dosage is given 24 hours after the second dose.



- After this, the same dosage is given once a day.
- As soon as the patient is able to take medicines orally, the full course of oral ACT (see Table 1) is given [11].

Prevention

Up until 2007, giving chloroquine to prevent malaria in pregnancy was part of the Government of India guidelines. But this was dropped in 2008. Government of India's guidelines issued in 2010 mention using personal protection methods such as insecticide treated bednets (ITNs) as the preferred mode of prevention of malaria in pregnant women. However, ITNs are not widely available to pregnant women through the public health system. A study carried out during 2006-2008 in Jharkhand and Chhattisgarh found that only in 1.4% of the 280 antenatal visits observed were ITNs reported to be used. However, more than 50% of the women reported sleeping under an untreated bed net the previous night [13].

Many countries of sub-saharan Africa with stable transmission of malaria have adopted Intermittent Preventive Treatment (IPT) for pregnant women. Pregnant women are given doses of Sulphadoxine-pyrimethamine (SP) in the second and third trimesters of pregnancy during every antenatal visit but not exceeding once a month. Using SP-IPT is considered to be not appropriate for India because the epidemiology of malaria is very different. Also, there is resistance to SP in the North Eastern States of India [14].

Gender issues affecting treatment and care of pregnant women with malaria

Women with malaria in pregnancy face a number of additional problems in receiving care and treatment because of gender-based inequalities in society. One study carried out in Gomia in Jharkhand reported that when women and men in poor households became sick with malaria, they were weakened also because of not getting adequate nourishment when sick. All they survived on was rice starch liquid called '*maar*'. Women – including those who were pregnant- were harassed by their husbands and in-laws for the expenditure the household had to incur for malaria treatment, and also for not being able to do household work. About half the pregnant women went to compounders for treatment, because they allowed payment to be made in installments. The husband and in-laws thought that the woman's treatment was her parents' responsibility. The treatment women were able to get depended on the amount that their parents were able to spend. The women did not get much time for rest and recovery and had to start doing household work soon after fever ended [15].

RECOMMENDATIONS

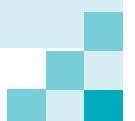
- *The extent of malaria in pregnancy in India remains unknown. The National Vector Borne Disease Control Programme (NVBDCP) does not collect data on pregnant women even though their increased vulnerability is well-known. An immediate first step is for the NVBDCP to collect data on malaria in pregnant women.*

- *Malaria may be contributing significantly to maternal and neonatal mortality and morbidity in India. Prevention and control of malaria in pregnancy needs to be integrated into Safe Motherhood Programmes.*
- *Malaria prevention and control measures need to be integrated into routine antenatal care, to begin with at least in states with endemic malaria. Since a large proportion of pregnant women with malaria may be asymptomatic, protocols need to be in place for routine screening for malaria followed by prompt treatment in malaria endemic areas. Distribution of ITNs to prevent malaria in pregnancy should also be part of routine antenatal care in malaria endemic states of India.*
- *The epidemiology of malaria in India is complex and varies across states. Separate guidelines need to be issued by the Government of India for diagnosis and treatment of malaria in pregnancy, discussing alternate regimens for different settings including situations where there is resistance to chloroquine or quinine.*
- *Gender-based inequalities add to the barriers women face in care and treatment for malaria and increase their vulnerability. Regular home visits to pregnant women during malaria outbreaks may help to identify early those infected with malaria and to initiate prompt treatment. In addition, follow-up throughout the treatment period to ensure adherence and completion would be crucial for saving lives.*



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