Original Article

# Prevalence of malaria in febrile pregnant women in Gulbarga, North Karnataka, INDIA

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## Abstract

**Background:** Malaria in pregnancy is an obstetric, social and medical problem of all over the world particularly in tropical and sub-tropical countries. There is a general opinion that pregnant women are more prone for malaria in a low transmission area. So this study aims to know the prevalence of malaria in febrile pregnant women in Gulbarga, north Karnataka, India**. Objective:** To determine the prevalence of malaria in febrile pregnant women and effects on maternal and fetal outcome. **Materials and Method: Study Design:** Cross sectional observation study. **Source:** Department of OBG, M.R. Medical College Hospital Gulbarga. **Study subjects:** 100 febrile pregnant women during the present pregnancy. **Method:** Subjects were tested for peripheral smear examination. Maternal and perinatal outcome correlated with malaria results. **Results:** The mean age of the studied subjects was 25.5± 2.3 years. Out of 100 patients 20 patients were malaria positive pregnant women, among them 45% were in first trimester, 25% in second trimester and 30% in 3rd trimester. The mean hemoglobin was lower in malaria subjects. Maternal mortality and perinatal outcome were not significant, since few patients came for follow up. In study subjects Plasmodium vivax (P.Vivax) malaria was found to be more common. **Conclusion:** Prevalence of Malaria is a cause of fever in 20% of febrile illness during pregnancy among them P. vivax malaria is more common.

**Keywords:** Malaria, Anaemia, low birth weight, preterm labour, abortion, fever.

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## INTRODUCTION

Malaria imposes great socio-economic burden on humanity, accounting for 85% of global infectious disease globally.[1] As per the world health organization report 2011-2012, South East Asian region bears the second largest burden of malaria (13%). Among South East Asia region India shares two thirds of the burden (66%) followed by Myanmar (18%) Indonesia (10%). India contributes over one fifth (22.6%) of clinical episodes of Plasmodium falciparum and 42% of episodes of Plasmodium vivax globally.[2,3] Malaria in pregnancy is different to the disease in non-pregnant state. The severity in pregnancy is thought to be due to general impaired immunity and diminution of acquired immunity to malaria in endemic areas. In malaria endemic countries pregnant women, along with children under five years, represent the most vulnerable group to Plasmodium falciparum infection.[4,5] Such infection often increases the risk of morbidity and mortality for the mother and her child. Indeed, in malaria stable transmission conditions, it has been shown that pregnancy associated with malaria increases the risk of maternal anemia, stillbirths and low birth weight (LBW).[6,7,8] Over 26% of anemia in pregnancy is attributable to malaria. Pregnant women with no previous immunity to malaria are two or three times more likely to develop severe disease as result of malaria infection than are non pregnant adult living in same area.[9] The symptoms of malaria vary from asymptomatic presentation to severe illness. Most of the studies are done in all pregnant women with or without history of fever to know prevalence of malaria in pregnant women. This study is chosen to know the

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prevalence of malaria in febrile pregnant women. Body temperature in pregnant women is normally raised about 0.2-0.3°C due to increased metabolism, Elevated levels of hormones such as progesterone, increased work load on the woman's body a result of extra weight as the pregnancy progresses as well as the processing and fetal nutrients and waste products.

## MATERIAL AND METHODS

A study was carried-out in the department of Obstetrics and Gynecology and department of medicine of M.R. Medical College, Basaveshwar and Sangameshwara Teaching and General Hospital Gulbarga, Karnataka, India over a period of one year from January 2013 to December 2013. It is a prospective observational study. A total of 2885 pregnant subjects admitted in the ward. Out of them 110 were febrile during the present pregnancy. Trained study personnel interviewed the enrolled women and collected information on socio-demographic characteristics, reproductive history including gravidity, trimester, history of fever and anti-malarial drug used and use of malaria prevention measures. Complete physical examination including the determination of gestational age from height of funds. Measurement of axillary temperature and other vital signs were also performed. Blood film preparation (thick and thin), rapid diagnostic test for P. Vivax and P. falciparum and Haemoglobin determination are done.

### Inclusion criteria

- Pregnant women with fever.

### Exclusion criteria

- Pregnant women with normal temperature.
- Pregnant women with history of fever for long duration.

## RESULTS

A total of 100 febrile pregnant women were included in the study after strict application of inclusion and exclusion criteria, Out of them 85% of the patients were from Gulbarga city proper and 15% from the rural area. During the study period 20 cases were confirmed malaria positive. Out of them 4 (20%) were falciparum malaria, 10 (50%) vivax and 6 (30%) were mixed. The mean age of the studied subjects was 25.5±2.3 year. Out of 20 malaria positive patients 11(55%) were in primi gravida and 6 (30%) patients were in second gravid and 3(15%) patients in multi gravida. There were 9 (45%) patients in the first trimester, 5 (25%) patients in the second trimester and 6 (30%) patients in the third trimester. The common symptoms of study population were fever with chills and rigors (100%), headache (25%), body ache (20%), vomiting (8%), anaemia (88%). Mean Axillary temperature in malaria positive patient is 37.7°C± 1.3°C. Increased pulse rate and respiratory rate. Hepato-spleno megally is seen in 5 malaria positive patients (P. falciparum-02, P. viavax-02 and mixed-01). The mean Hb was 7.18±2.31g%. 10% of patients admitted for blood transfusion. The prevalence of pre-eclampsia and eclampisa was not seen in our study, may be due to proper management of malaria. Although intrapartum fetal distress was more frequent in MP positive subjects and there was no significant difference in the mode of delivery. Maternal mortality was nil. Only six patients have delivered in our hospital. Out of six patients, two have abortions (one at 10 weeks and other at 18 weeks), one patient had preterm delivery and remaining three have a normal full term delivery.

**Table 1:** Distribution of cases according to period of gestation

| Period of gestation | No. of cases | Percentage (%) |
|---|---|---|
| 1st Trimester | 09 | 45 |
| 2nd Trimester | 05 | 25 |
| 3rd Trimester | 06 | 30 |
| **Total** | **20** | **100** |

**Table 2:** Stage of pregnancy outcome in the study population

| Pregnancy outcome | Stage of pregnancy | | |
|---|---|---|---|
| | 1st Trimester | 2nd Trimester | 3rd Trimester |
| Abortion | 01(5%) | 01 (5%) | 00 (0%) |
| Preterm delivery | 00 (0%) | 00 (0%) | 01 (5%) |
| Full term normal delivery | 00 (0%) | 00 (0%) | 03 (15%) |
| Maternal deaths | 00 (0%) | 00 (0%) | 00 (0%) |
| Neonatal death | 00 (0%) | 00 (0%) | 00 (0%) |
| IUGR | 00 (0%) | 00 (0%) | 00 (0%) |
| Still birth | 00 (0%) | 00 (0%) | 00 (0%) |

**Table 3:** Malaria prevalence by paring at stage of pregnancy

| Parity | 1st trimester | | | | 2nd trimester | | | | 3rd trimester | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total no. Of cases | P. f | P. v | mixed | Total no. Of cases | P. f | P. v | mixed | Total no. Of cases | P. f | P. v | mixed |
| Primi Gravida | 06 | 01 | 02 | 03 | 01 | 00 | 00 | 01 | 01 | 00 | 01 | 00 |
| Gravida II | 01 | 00 | 01 | 00 | 02 | 00 | 01 | 01 | 01 | 00 | 01 | 00 |
| Gravida III | 02 | 01 | 01 | 00 | 02 | 01 | 01 | 00 | 04 | 01 | 02 | 01 |

## DISCUSSION

In low transmission setting such as north Karnataka belt like Gulbarga population, the immunity to malaria is not well developed and it has serious consequences for both the mother and fetus. Even though majority of the pregnant women in our study from the Gulbarga city proper, most of them had unsatisfactory antenatal care bear the brunt of this disease this may be because of illiteracy and lack of communication of education programs to pregnant women. Similar demographic characteristics were reported by Singh *et al*. [10] Since very little information is available on the relationship between malaria and pregnancy in the Indian subcontinent, the present study on febrile pregnant women in Gulbarga, Karnataka, India is of special interest.

The highest malaria prevalence was among primigravida, followed by second gravidae and multi gravidae, which will not completely accords with reports from other studies. [4,10] A study done by singh *et al* in 2001 shows prevalence of malaria is more in second trimester irrespective of parity status. [10] A prospective control study showed that prevalence of malaria infection for both P. vivax and P. falciparum are more in third trimester. [10] A study done by Vidyadhar B. Bengal in 2012 shows prevalence of malaria was more in first trimester. [11] Our study shows prevalence of malaria is more in first trimester.

Singh *et al*., in their study in same department between 1992 and 1995 reported P. Vivax positivity in 33% and falciparum was positive in 67%, gita *et al*. [12] also done a study in febrile pregnant women which showed 13.8% P. vivax and 70.2% P. falciparum and 16% mixed infection. [12] while our study shows 20% falciparum and 50% vivax and 30% mixed infection in the febrile pregnant women, The national vector borne disease control program in Karnataka-2012 showed 16418 malaria positive patients among 12665363 population screened for malaria (0.12%) as per the NVDCP 2012 report in Gulbarga shows 1158 Malarial positive patients among the 1100194 populations screened (0.10%). NVDCP 2012 report from Gulbarga, Karnataka, India shows P. vivax infection was more than P.falciparum malaria infection which will accord with our study. It suggests that the pattern of malaria and species dominance may vary in areas of different endemicity. [12]

According to the study done, Pregnancy related complications in the form of preterm Live birth (20%), intrauterine death (31.11%); still births (13.33%) and abortions (11.11%) were more pronounced in primiparaous women as compared to multiparous women. [12] Pregnancy related complications like abortion 10% and preterm delivery 05% are seen in our study probably due to only six patients reached to the obstetric ward. Maternal and neonatal deaths are not seen in our study. The National malaria education program (NMEP) has been active since 1958 and the Regional Malaria Research centre in Jabalpur is the Largest centre working in the field of malaria eradication, yet 89.2% of the subjects were not using effective malaria prevention measures. It was more due to lack of motivation and the failure to realize the serious implications of malaria, particularly in pregnancy rather than due to scarcity of resources. Since pregnant women are more prone for malarial parasitic infection there is need of a study to evaluate a prevalence of malaria in pregnant women. Government efforts to take antenatal call to the doorstep of a pregnant women often has the negative fallout of such subjects never coming in contact with a qualified physician in a Health care centre and many morbidities are missed until they become serious. In present study we did not find any HIV positive subject with malaria which is very significant because these subjects were under direct and regular ANC at Medical College hospital. This once again emphasizes the impact that good ANC can have on improving maternal fetal outcome in pregnancy.

## CONCLUSION

Malaria is the commonest cause of fever during pregnancy. First trimester pregnant women affected more. Malaria infection is more commonly seen in Primigravida and Gravida III. P. vivax malaria is more commonly seen in pregnant women. Maternal and perinatal morbidity and mortality are not seen in our study. Efforts must be made to find out the constraints in the use of antimalarial measures by the population and its limitations to address them effectively, in addition to raising awareness about the adverse impact of malaria in pregnancy. The present

study included only pregnant subjects with fever (present (or) past) during pregnancy. However, in febrile malaria subjects the risk of complications like chronic anemia, ill health, IUGR, prematurity, IUD, fetal distress which include all pregnant subjects with adverse maternal or fetal outcome with or without fever. Hence it needs all pregnant women should be screened for malaria parasite. So that the exact burden of malaria in pregnancy may be ascertained.

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