

**STUDY OF MATERNAL AND PERINATAL OUTCOME IN WOMEN PRESENTING WITH FEBRILE ILLNESS DURING PREGNANCY**Surabhi Porwal<sup>1</sup>, Kavita N. Singh<sup>2</sup>**HOW TO CITE THIS ARTICLE:**

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**ABSTRACT: OBJECTIVE:** To find out the prevalence of various pathogens responsible for febrile illness during pregnancy and their impact on maternal and perinatal outcome. **METHODS:** After approval by institutional ethical committee the prospective case control study was conducted in the department of obstetrics and gynecology, NSCB Medical College, Jabalpur (M.P.) from 1<sup>st</sup> June 2012 to 31<sup>st</sup> October 2013. A total 100 febrile antenatal women as cases and 50 antenatal women without fever as control were included and analyzed in this study. In women fulfilling inclusion criteria detailed history was taken and documented in proforma. Required investigations were sent to the department of pathology and virology laboratory of Indian Council of Medical Research, Jabalpur. Results were analyzed statistically by using t test and chi square test. **RESULT:** Prevalence of viral pathogen responsible for febrile illness during pregnancy was highest 19.33%, followed by bacteria (16%) and protozoa (16%) each. Duration of stay in the hospital, preterm delivery, coexisting maternal morbidity were more in cases as compared to control and were statistically significant. 9% cases died due to Malaria and Hepatitis B. Incidence of prematurity (55%), low birth weight (72%), perinatal mortality (41%) (Intrauterine death & Still birth), neonatal admission in nursery (34%) and congenital malformation (6%) were more in cases as compared to control and were statistically significant. **CONCLUSION:** Fever during pregnancy is major public health problem and a high risk situation. Early identification of high risk cases should be done, so that prompt treatment will be instituted early, thereby reducing maternal and perinatal morbidity & mortality associated with fever.

**KEYWORDS:** Febrile illness, Infection in pregnancy.

**INTRODUCTION:** According to ICMR (Indian Council of Medical Research) study virus were responsible for most of the febrile illness during pregnancy. Pregnancy is a period associated with a number of reversible physical changes to accommodate the demands of a developing fetus. During their antenatal period they might be suffering from many problems and fever is one of the common problems. The purpose of the present study was to find out the prevalence of various pathogens responsible for febrile illness during pregnancy and their impact on maternal and perinatal outcome.

**METHODS:** This study was a prospective case control study approved by the Institutional ethical committee and conducted at the department of obstetrics and gynecology NSCB Medical College, Jabalpur, during the period from 1<sup>st</sup> June 2012 to 31<sup>st</sup> October 2013.

A total 100 Antenatal women with complaints of fever within 1 month of reporting to antenatal outpatient department and labor room of Obstetrics and Gynaecology Department were included and analyzed in this study. For comparing the various factors of maternal and perinatal outcome 50 disease free (afebrile cases) control were also included in this study.

## ORIGINAL ARTICLE

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Detailed history of each case and control was taken regarding name, age, address, socioeconomic status, literacy, obstetric history, menstrual history, any symptom associated with fever noted and documented in proforma and required investigation samples were sent to the department of pathology and virology laboratory of Indian Council of Medical Research, Jabalpur. The reports of investigations were collected and prevalence of various pathogens responsible for febrile illness during pregnancy recorded. Follow up of patients with febrile illness was done and their impact on maternal and perinatal outcome was studied.

Maternal outcome was recorded as (i) discharge healthy from hospital, (ii) duration of stay in hospital, (iii) term or preterm delivery, (iv) mode of delivery (vaginal or caesarean delivery), (v) coexisting maternal morbidity and (vi) maternal mortality and cause of maternal mortality due to fever noted. Perinatal outcome was recorded as (i) live birth/still birth or intrauterine death, (ii) APGAR score, (iii) birth weight, (iv) neonatal admission in nursery and (v) congenital malformation in fetus.

All the proforma were entered using Microsoft 2007 Excel worksheet. Results were analyzed statistically by using t test and chi square test.

**RESULTS:** In our study, 100 cases and 50 controls were included and analyzed. Majority of the cases (49%) and control (46%) were observed in age group of 21- 25 years. The mean maternal age of case was found to be  $24.59 \pm 4.35$  (18-39 years) and in control  $24.5 \pm 3.74$  (19-35 years). There was more booked cases in control group (82%) compared to cases (37%) and the difference was statistically highly significant ( $p < 0.0001$ ). Analysis of clinical symptoms of cases and control showed that fever was the presenting symptoms in all cases, 91% cases present as fever with chills and 9% cases present as fever without chills.

Fever, cough, malaise, rash, headache, nausea, joint pain, anorexia, breathlessness and burning and frequent maturation were significantly higher in cases as compared to control. All 100% cases were anemic of which 32% were mild anemic, 44% moderate and 24% severely anemic while in the control group 54% patients were reported anemic of which 48% were mild and 6% patients were moderately anemic and difference of anemia status between cases and control was recorded statistically highly significant ( $p < 0.0001$ ).

All investigations done in cases and control shows that serum creatinine, serum bilirubin, SGOT/SGPT, platelet count, urine routine and microscopic, urine culture and sensitivity, widal test, peripheral smear for malaria parasite, and hepatitis B and hepatitis C were significantly higher in cases compared to control. Viruses were responsible for majority (29%) of cases of fever during pregnancy and prevalence was 19.33% followed by bacteria and protozoa in 24% each and prevalence was 16% each (table-1). All 100% pregnant women admitted without febrile illness discharged healthy from hospital however 91% febrile pregnant women discharged healthy from hospital and 9% died due to malaria and hepatitis.

The statistical finding suggests that this difference was statistically significant ( $p < 0.05$ ) (table-2). In all 100% pregnant women without febrile illness duration of stay in hospital was  $< 3$  days, however in 13% of pregnant women with febrile illness duration of stay was  $< 3$  days, in 53% duration of stay was 3-8 days, in 34% duration of stay was  $> 8$  days. The difference of statistical analysis between cases and control was highly significant ( $p < 0.001$ ) (table-2). In control group 90%

## ORIGINAL ARTICLE

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patients delivered at term while in case group 45% patients delivered at term and 55% cases had preterm delivery.

The difference between cases and control was statistically highly significant ( $p < 0.001$ ) (table-2). In control 94% cases delivered vaginally while in case group 88% cases delivered vaginally, rest 12% cases delivered by cesarean section. The difference was statistically significant ( $p < 0.05$ ) (table-2). In control 54% patients had co-existing maternal morbidity; however in 96% cases had co-existing maternal morbidity. The difference was statistically highly significant ( $p < 0.0001$ ) (table-2). In case group maternal mortality was 9% due to malaria and hepatitis compared to control group the difference was statistically significant ( $p < 0.05$ ) (table-2).

In control group 8% patients had fetal loss (still birth/intrauterine death) however in case group 41% patients had fetal loss (still birth/ intrauterine death) the difference between cases and control was highly significant ( $p < 0.0001$ ) (table-3). In control group 92% babies born had APGAR score  $> 5$  while in case group only 59% cases had APGAR score  $> 5$  and rest 41% babies born had APGAR score  $< 5$ . The difference was statistically highly significant ( $p < 0.0001$ ) (table-3).

In cases 72% patients had low birth weight babies ( $< 2.5$  kg) however in control only 8% patients had low birth weight. The difference between case and control was highly significant ( $p < 0.0001$ ) (table-3). In cases 34% babies were admitted in nursery while in control nursery admission was 8%. The difference between cases and control was highly significant ( $p < 0.0001$ ) (table-3). In cases, 4 babies had neural tube defect and 2 had fetal ascites (table-4).

**DISCUSSION:** The present prospective case control study was undertaken with 100 febrile antenatal women as cases and 50 antenatal women without fever as control who attended the antenatal outpatient department and labor room of NSCB medical college and hospital, Jabalpur, Madhya Pradesh.

In our study majority of the cases (49%) and control (46%) were observed in age group of 21-25 years. The mean maternal age of case was found to be  $24.59 \pm 4.35$  (18-39 years) and in control  $24.5 \pm 3.74$  (19-35 years). No age difference between cases and control observed. The reason being that the attendance of antenatal outpatient department and labor room is maximum in this age group.

According to Murthy and Makhija<sup>1</sup> (1988) women in 20-24 years age group awaited maximally of antenatal patients and utilization decreased at extremes of age.

In our study, Analysis of booked/ un booked history revealed that there was more booked cases in control group (82%) compared to cases (37%).

Analysis of socioeconomic and demographic factors showed that there was no significant difference in between case and control group and the groups were matching.

In present study, Fever was the presenting symptoms all cases, 91% cases present as fever with chills and 9% cases present as fever without chills. Among associated symptoms malaise was the commonest symptom in 70% of cases, second commonest associated symptom was nausea and vomiting 69% cases, followed by third commonest associated symptom was cough 54%. Fever, cough, malaise, rash, headache, nausea, joint pain, anorexia, breathlessness and burning & frequent micturition were significantly higher in cases as compared to control.

In present study, all 100% cases were anemic of which 32% were mild anemic, 44% moderate and 24% severely anemic while in the control group 54% patients were reported anemic of

## ORIGINAL ARTICLE

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which 48% were mild and 6% patients were moderately anemic. This figures shows febrile patients were prone for development of anemia leading to maternal morbidity.

Giles et al,<sup>2</sup> 1969 reported that there was poor correlation between hemoglobin level and parasitic index of malaria during pregnancy which was one of the cause of fever during pregnancy.

Mc Gregor,<sup>3</sup> 1993 reported that parasitemia peaks during the second trimester of pregnancy followed by peak occurrence of anemia.

In present study, viruses were responsible for majority (29%) of cases of fever during pregnancy and prevalence was 19.33% followed by bacteria and protozoa in 24% each and prevalence was 16% each. Prevalence of mixed infections like bacteria and protozoa, bacteria and virus, virus and protozoa were 10%, 3.33% and 2% (table 1).

Dateyet al.<sup>4</sup> (2003) in a multi centric ICMR study reported the highest incidence of 4.5% HIV in pregnancy from Mumbai compared to less than 1.0% in other centers.

Dave et al.<sup>5</sup> (2002) from Indore documented that 33 out of 500 pregnant women tested HIV positive. The age group of 25-34 was mainly affected; the mean age was 28.5 years.

In present study, Analysis revealed all 100% pregnant women without febrile illness discharged healthy from hospital however among febrile pregnant women 91% discharged healthy from hospital and 9% patients died due to malaria and hepatitis B during pregnancy. Out of 9 patients, 5 died due to malaria and 4 due to hepatitis B virus (table 2).

Menendez<sup>6</sup>, Nosten,<sup>7</sup> Rogerson<sup>8</sup>, 2007 and all their colleagues in their study found that malaria, whether symptomatic or asymptomatic, causes a dis proportionate rate of morbidity & mortality in pregnancy.

Bhatia,<sup>9</sup> 1990 reported that incidence of total deaths due to jaundice in pregnancy reported from India ranged from 10 to 20%. Of these 90% were attributed to viral hepatitis.

Mathai,<sup>10</sup> 1996 reported that viral hepatitis is an important cause of maternal mortality in India, accounting for 0.8-29.4%. The mortality is 3.5 fold higher during pregnancy than in non-pregnant women.

In our study, Analysis revealed, in all 100% pregnant women without febrile illness duration of stay in hospital was <3 days, however in 13% of pregnant women with febrile illness duration of stay was <3 days, in 53% patients duration of stay was 3-8 days and in 34% patients duration of stay was > 8 days (table 2). This figures shows that fever during pregnancy increases duration of stay in hospital and increases maternal morbidity.

In our study, in control group 90% patients delivered at term while in cases 45% cases delivered at term rest 55% cases had preterm delivery (table 2).

Stratton and associates,<sup>11</sup> (1999) in a review of 634 HIV infected women reported adverse fetal outcome as fetal growth restriction in 24% & preterm birth in 20%.

In present study, in control 94% cases delivered vaginally while in cases 88% cases delivered vaginally, rest 12% cases delivered by cesarean section (table 2). This figure shows febrile patients had increased morbidity due to cesarean section.

Madhivanan et al<sup>12</sup> from Chennai (2002) reported in HIV positive pregnant women delivery was accomplished vaginally in 5% whereas cesarean section was performed in 34%.

In our study, in control group 54% patients had Co-existing Maternal Morbidity, however in 96% cases had Co-existing Maternal Morbidity (Table 2). This figure shows coexisting morbidity increased due to fever during pregnancy.

## ORIGINAL ARTICLE

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In present study, in control group 8% patients had fetal loss (Still birth/Intrauterine death) however in case group 41% patients had fetal loss (Still birth/Intrauterine death) (Table 3). This figure shows fever during pregnancy was one of the important causes of still birth & intra uterine death during pregnancy.

Patel et al,<sup>13</sup> (2000) from Pune reported in HIV positive pregnant women, PROM was reported in 24.2% and incidence of fetal wastage exceeded 24%.

Goldenberg and Thompson,<sup>14</sup> 2003, reported that fetal infection due to maternal parvovirus infection has been associated with abortion, nonimmune hydrops and still birth.

In present study, in control group 92% babies born had APGAR score >5 while in case group 59% cases had APGAR score >5 and 41% babies born had APGAR score <5 (Table 3). This figure shows fever during pregnancy leads to adverse fetal outcome.

In present study, in case group 72% patients had low birth weight babies (<2.5 kg) however in control group only 8% patients had low birth weight (Table 3).

Patel et al,<sup>13</sup> 2000 from Pune reported that the mean birth weight of babies born to HIV positive mothers was about 120gm lower than in normal controls.

In present study, in case group 34% babies were admitted in nursery while in control group nursery admission was 8% (table 3). This figures shows neonatal admission rate increased due to low birth weight babies in febrile patients.

In our study, in cases, 4 babies had neural tube defect and 2 had fetal ascites (table 4). This implies that fever during pregnancy leads to congenital malformation in babies.

Rogers,<sup>15</sup> (1999) reported parvovirus is the most common infectious cause of non-immune hydrops in autopsied fetus.

In M. Paul's<sup>16</sup> book: "Occupational and Environmental Reproductive Hazards", she says that when maternal core temps reach 102°F. (38.9°C. or greater), there have been reports of abnormal fetal development. Fevers this high, which occur during the period of neural tube closure (days 20 to 28 after conception), have been associated with a significantly increased incidence of central nervous system related defects.

**CONCLUSION:** Fever during pregnancy is a global health problem, it has a worldwide distribution but prevalence of each pathogen different from one country to another. Fever during pregnancy is a common problem encountered in clinical setting.

In this study, fever was common presentation of febrile illness during pregnancy. Anemia was most common co-morbidity associated with fever during pregnancy.

Virus was most common cause of febrile illness during pregnancy in this study. Fever during pregnancy leads to adverse maternal outcome in the form of spontaneous abortion, preterm labor and maternal morbidity & mortality.

Fever during pregnancy leads to adverse fetal outcome in the form of fetal growth restriction, intra uterine death, still birth, low birth weight, congenital malformation, neonatal admission in nursery and neonatal death.

With our work we conclude fever during pregnancy is major public health problem and a high risk situation. Early identification of high risk cases should be done, so that prompt treatment will be instituted early, thereby reducing maternal & perinatal morbidity & mortality associated with fever.

## ORIGINAL ARTICLE

Pathogens	Frequency (%)	Prevalence (n=150)
Virus	29 (29%)	19.33%
Bacteria	24 (24%)	16%
Protozoa	24 (24%)	16%
Bacteria + Protozoa	15 (15%)	10%
Virus + Bacteria	5 (5%)	3.33%
Virus + Protozoa	3 (3%)	2%

**Table 1: Distribution of cases according to prevalence of pathogens**

Sr. no.	Parameter	Case (n=100)	Control (n=50)	Total	P value
1.	<b>Discharge Healthy from Hospital</b>				
	Yes	91 (91%)	50 (100%)	141 (94%)	<0.05
	No	9 (9%)	0	9(6%)	
2.	<b>Duration of stay in Hospital (in days)</b>				
	<3	13 (13%)	50 (100%)	63 (42%)	<0.0001
	3-8	53 (53%)	0	53 (35.3%)	
	>8	34 (34%)	0	34 (22.7%)	
3.	<b>Term/Preterm Delivery</b>				
	Term	45 (45%)	45 (90%)	90 (60%)	<0.0001
	Preterm	55 (55%)	5 (10%)	60 (40%)	
4.	<b>Mode of Delivery</b>				
	Vaginal	88 (88%)	47 (94%)	135 (90%)	0.012
	Cesarean section	12 (12%)	3 (6%)	15 (10%)	
5.	<b>Co-existing Maternal Morbidity</b>				
	Yes	96 (96%)	27 (54%)	123 (82%)	<0.0001
	No	4 (4%)	23 (46%)	27 (18%)	
6.	<b>Maternal Mortality</b>				
	Yes	9 (9%)	0	9 (6%)	0.029
	No	91 (91%)	50 (100%)	141 (94%)	

**Table 2: Distribution of cases according to various parameters of maternal outcome**

Sr. no.	Parameter	Case	Control	Total	P value
1.	Birth outcome				
	Live birth	59 (59%)	46 (92%)	105 (70%)	<0.0001
	Fetal loss (still birth/IUD)	41 (41%)	4 (8%)	45 (30%)	
2.	APGAR Score				
	> 5	59(59%)	46 (92%)	105(70%)	<0.0001
	< 5	41 (41%)	4 (8%)	45 (30%)	
3.	Birth weight				
	> 2.5kg	28 (28%)	46 (92%)	74 (49.3%)	<0.0001
	< 2.5kg	72 (72%)	4 (8%)	76 (50.6%)	
4.	Nursery admission				
	Yes	34 (34%)	4 (8%)	38 (25.3%)	<0.0001
	No	66 (66%)	46 (92%)	112 (74.7%)	

Table 3: Distribution of cases according to various parameters of Perinatal Outcome

Congenital malformation	Cases	Frequency
Neural tube defect	4	4
Fetal ascites	2	2

Table 4: Perinatal outcome according to congenital malformation in babies

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