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A Clinical Study on Pyrexia in Pregnancy with Special Emphasis on Fetomaternal Outcome

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Abstract: ***Aim: Since fever in pregnancy is a common clinical problem with bearing on both the mother and her fetus, therefore, this study was undertaken to evaluate the fetomaternal outcome in pregnancy with pyrexia. Materials & Methods: 185 pregnant women with fever were enrolled in this prospective, hospital based study. Patients with fever due to septic abortions & blood transfusions were excluded. After clinical examination and routine investigations necessary to detect the underlying cause of fever were done and noted, they were followed throughout the pregnancy, labour and puerperal periods and maternal complications along with adverse fetal outcomes in terms of preterm delivery, perinatal death, low birth weight, low APGAR score at 5 minutes, NICU admissions were noted. The frequency of maternal morbidity and complications was compared according to their age, parity, and period of gestation. Results: Malaria was found to be leading cause of pyrexia among pregnant women (28 %), followed by dengue (20%), UTI, viral hepatitis and respiratory tract infections. Both maternal & fetal complications were higher in pregnancies complicated with fever. Preterm labour and preterm birth, low APGAR score and NICU admission were the most common perinatal complications. Conclusion: In our study we found that pyrexia in pregnancy caused a wide range of maternal and fetal complications and morbidity.***

Keywords: Low birth weight, pregnancy, pyrexia, pregnancy complications, pregnancy outcome.

Abbreviations

- IUGR – intra uterine growth retardation
- UTI – urinary tract infection
- NICU – neonatal intensive care unit
- PTL – preterm labour
- PUO –pyrexia of unknown origin

1. Introduction

Pyrexia in pregnancy is a very common clinical entity worldwide. The risk to the mother and her fetus is increased significantly in pregnancy complicated by infection and fever. Since many cases have atypical and uncommon presentation, fever in pregnancy poses problems for the clinician to diagnose the cause and treat it accordingly. Moreover, maternal immune function is usually altered and decreased due to the physiology of pregnancy and many of the potent antibiotics have to be used with caution in pregnancy due to the risk of teratogenicity. (1, 2)

Therefore, some febrile diseases may take a more severe and life threatening course in pregnancy leading to transplacental transmission leading to adverse fetal outcome.

Furthermore, intrapartum fever in the absence of infection has been found to be associated with increased risk of developing neonatal hypoxia, ischaemic encephalopathy & unexplained neonatal seizures. (3, 4). Because of maternal pyrexia, the fetus is exposed to various inflammatory mediators as evidenced by umbilical cord blood cytokines in documented absence of neonatal sepsis (5). The underlying maternal cytokine polymorphism is strongly associated with both intrapartum fever & cerebral palsy at term (6, 7). Increased brain temperature increases oxygen consumption lowering the threshold of hypoxic injury. Hypothermia amelionates hypoxic brain injury in term monates (8, 9). In our study, we have enrolled pregnant women presenting with pyrexia especially of infectious origin to detect the various life-threatening medical complications leading to severe maternal morbidity & its impact on fetal outcome. The study was undertaken with the specific objective to assess the highly variable medical suffering from pyrexia according to the eiological basis and also the possible fetal complications.

2. Materials & Methods

Our study was a hospital based prospective observational study conducted in the department of Obstetrics & Gynecology, Teerthanker Mahaveer Medical College & Research Centre, Moradabad, U. P. All antenatal patients presenting with fever to the OPD, Labour room & Emergency during the period from January 2012 to January 2014 were enrolled in the study after ruling out the exclusion criteria.

Exclusion Criteria

- Fever Due to { Seplic abortion { Blood transfusion reaction
- Hypertension
- Diabetes mellitus
- Renal diseases
- Cardiovascular diseases

A total of 185 patients were enrolled in the study after getting informed consent and approval from the institutional Ethical committee. Thereafter, a detailed clinical history including their baseline socio-demographic data comprising of age, parity and the period of gestation (trimester of pregnancy) at which the diagnosis of fever was recorded & a thorough clinical examination was done. All the patients were subjected to routine investigations e.g. Hb, ABO-Rh, CBC (Complete Blood Count), Urine -Routine & Microscopy, HVS (High Vaginal Swab) Culture & Sensitivity, Urine Culture & Sensitivity, thin & thick peripheral blood smears, malaria and dengue antigen detection by serology. Widal test and Typhi dot tests were done to rule out Typhoid (Enteric Fever) & LFT (Liver Function Tests). Wherever indicated Viral Hepatitis was diagnosed by IgM capture Elisa technique. Sputum for diagnosis of tuberculosis (TB). All the investigation reports were recorded and the patients were followed up from the time of enrolment in the study till discharge from the hospital after delivery. All the incidences of maternal complications and perinatal outcome in terms of preterm delivery, perinatal death, Low birth weight, Low APGAR Scores, NICU admissions, maternal sepsis, prolonged hospital stay were recorded. All socio-demographic data, personal identifier, clinical and laboratory data were entered in a semi-structured pre-designed case record form for individual subjects. Thereafter, all the collected data were tabulated & analyzed. Microsoft excel 2010 was used for calculations. Analysis was done using statistical software for calculation of statistical tests of significance.

3. Results

A total of 185 patients with pyrexia were included in our study. Malaria (26%), Dengue (21%), UTI (20%), TB (4. 0%), Respiratory Tract Infections (RTI) (12. 4%) viral hepatitis (8. 0%), Chicken pox (2. 8%), and typhoid (7. 0%) were the most common causes of pyrexia. PUO (Pyrexia of unknown origin) = 3. 2%

Table 1: Age Distribution of the Patients. (n = 185)

Age Group (yr.)	*No. of Patient*	*Percentage (%)*
<19	25	13. 5
20 -30	110	59.
>30	50	27. 0

Most of our patients belonged to the age group of 20 -30 years, presented with fever in the second trimester of pregnancy and were primigravida. Percentage of maternal medical complication in each demographic stratum was calculated.

Table 2: Gestational Age at presentation with fever

Gestational	*Age*	*No. of Patients*	*Percentage (%)*
1st Trimester	(0-12 weeks)	35	19. 0
2nd Trimester	(13-28 weeks)	90	48. 6
3rd Trimester	(29 – 40 weeks)	60	37. 4
Total		185	100. 00 %

Table 3: Parity -wise distribution of the patients

Parity	*No. of Patients*	*Percentage (%)*
P0	88	47. 6
P1	35	19. 0
P2	32	17. 2
>P3	30	16. 2
Total	185	100. 00 %

Table 4: Etiological distribution of Pyrexia

Etiology	*No. of Patients*	*Percentage (%)*
Malaria	40	21. 6
Dengue	32	21. 0
UTI	37	20. 0
RTI (Resp. tract infection)	23	12. 4
Viral hepatitis	15	8. 0
Typhoid (enteric fever)	13	7. 0
Tuberculosis	8	4. 0
Chickenpox	4	2. 8
Others PUO (Pyrexia of unknown origin)	6	3. 2
Total	185	100. 00 %

We applied Chi-square test for detecting association between incidence of maternal complication and socio-demography categories. No statistical association was present between demographic characteristics & maternal complications. Complications which were encountered in this study were pleural effusion, bronchopneumonia, severe anaemia, diarrhea and acute gastro-enteritis, hypoglycaemia, jaundice, convulsions and acute renal failure (ARF) urinary tract infection was the most common complication. (%) followed by bronchepeunia (%) & severe anaemia (%), acute gastro-enteritis and diarrhoea and hypoglycemia were also very commonly encountered. Malaria & Dengue were associated with higher incidences of morbidity and associated complications. Proportion of complications was also high in enteric fever and hepatitis. Anaemia was also associated with other complications.

Adverse fetal outcomes encountered were low birth weight (LBW) (52. 6 %), Preterm birth (27. 8 %), intra uterine growth retardation (IUGR) (20. 3 %), low APGAR score (< 7) at 5 minutes after birth (18. 6 %) and perinatal mortality (5. 0 %), Intrauterine fetal death (IUFD) (2. 8 %) in these patients with pyrexia in pregnancy. All the pregnencies were singleton & the mean birth weight was 2. 24 kg (SD =0. 4).

More than half of the babies were low birth weight (LBW) with 2. 8% IUFD (intra urterine fetal deaths) & 5. 0 % perinatal mortality. Overall, almost 65% deliveries had at least one or more adverse outcome. LBW babies were the most common adverse event. Malaria and dengue in pregnancy contributed to the maximum proportion of cases for all typies of adverse fetomaternal outcome cases with urinary_tract infection presented with minimal maternal complications like cystitis and nephrolithiasis but there were considerable adverse fetal outcome with UTI like preterm birth, low birth weight and longer hospital stay. Tuberculosis and chickenpox in pregnancy were also associated with adverse fetomaternal outcome.

4. Discussion

Fetus being an integral part of the fetomaternal unit and pregnancy involving numerous physiological changes & adaptations, pyrexia during the pregnancy affects both the mother and her fetus adversely. Normally during intrauterine life, the fetal body temperature is maintained by utero-placental circulation and heat- exchange at the amniotic fluid interface. These limited routes of heat transmission from the mother maintain fetal temperature approximately 0. 5°c -0. 75°c higher than the maternal body temperature (11). Effects of pyrexia on pregnancy depend on the extent of the rise in the temperature. Minimal temperature rise during preimplantation period and severe exposures during embryonic and fetal development might result in miscarriage, preterm births, IUGR and IUFD & stillbirths. In a study by Morishima et al, it was observed that uterine activity increased resulting in deterioraling fetal conditions with maternal hyperthermia (12). Similarly, Cefalo and Hellegers demoustrated fetal jeopardy with maternal hyperthermia causing cardio-vasculer collapse (13). In our study we found adverse fetal outcome of preterm birth, IUGR, LBW, IUFD, poor APGAR score (<7 at 5 minutes after birth) and perinatal death accountable to maternal hyperthermia due to pyrexia in pregnancy. Liebesman et al (4) demonstrated a strong association between intrapartum fever & low APGAR score, increased requirement of resuscitation & neonatal seizures in the first 24 hours following birth. Compromised circulation resulting from infection related vasculitis and higher metabolic demands in febrile condition might be the key players in earlier development of fetal acidosis. In this study, apart from the perinatal morbidity, we made efforts to find out various atypical clinical presentations of pregnant women arising in febrile condition. Previous studies reported that nulliparous women were more likely to exhibit intrapartum fever than parous women (15, 16, 17). This might be explained by the theory of increased metabolic expenditures leading to contractions of uterine and skeletal musculature in nulliparous women as compared to parous mother. (18).

In this study our focus was on pyrexia in the antenatal period. Majority of our study subjects were nulliparous (47. 6%). Pyrexia induced hyperthermia along with typical effect of infections agents, inflammatory reactions compounded by maternal complications has profound effect on the fetus. We found that while maternal complications were very much dependent on the etiology of the pyrexia, the fetal outcomes overlapped irrespective of the cause of the fever. Moreover, adverse fetal outcomes were more numerous and severe as compared to maternal complications. Hence it can be hypothesized that hyperthrmia related changes in the uterine mileu affects the fetus more adversely than the mother in pyrexia in pregnancy.

5. Conclusion

Pyrexia in pregnancy, a common clinical entity, results in a wide range of maternal medical complications as well as fetal and neonatal complications. Pyrexia from various etiologies that range from preventable infections like malaria, dengue, typhoid and hepatitis result in adverse fetomaternal outcome. Therefore, standard methods of infection control in homes, communities and health-care settings, improving health education and awareness will go a long way in preventing such adverse fetomaternal outcomes.

6. Conflict of Interest

None

7. Funding

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