

Original Research Article

Thrombocytopenia due to monsoon related illness: as an underestimated cause of maternal mortality and morbidity

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ABSTRACT

Background: Thrombocytopenia is a second leading cause of blood disorder in pregnancy after anaemia. It is defined as platelet count below 1,50,000/ul. It is a common condition occurring in approximately 7-10% of pregnancies. Gestational thrombocytopenia is physiological and occurs in 70-80% of population having platelet count of 1,30,000/ul-1,50,000/ul with no adverse consequences. Other causes of thrombocytopenia in pregnancy could be immune related like immune thrombocytopenia, thrombotic thrombocytopenia or pregnancy related disorders like hypertensive disorders, eclampsia, HELLP and fatty liver of pregnancy. Besides this, pregnant ladies can have thrombocytopenia associated with fever which is commonly observed in monsoon season. It could be because of various causes like dengue, malaria, leptospirosis or other viral infections. Thrombocytopenia carries a risk of haemorrhage for both mother as well as newborn. It carries a risk of vertical transmission leading to premature birth, neonatal thrombocytopenia, intracranial haemorrhage and foetal death. There is relatively less information regarding importance of diversity of infectious diseases on pregnancy outcome.

Methods: 14 pregnant patients were studied on the basis of their history of fever, platelet count below 1,50,000/ul and any history of haemorrhage or petechie during monsoon period from June to September 2019 admitted in gynaecological ward in HBTMC and Dr. R. N. Cooper Hospital, Mumbai. All patients were subjected to fever profile, repeated haemogram for platelet trend and medical reference was done.

Results: Out of 14 patients, 9 patients had negative fever profile, 2 were dengue positive, 2 were widal positive and one was leptospira positive patient. All patients had platelet count less than 1,50,000/ul out of which 3 patients received platelet transfusion..

Conclusions: Monsoon fever with thrombocytopenia requires early diagnosis and optimal treatment to reduce maternal mortality and to avoid adverse fetal outcome. There is a strong need to create awareness amongst the community.

Keywords: Fever, Mortality, Morbidity, Pregnancy, Postpartum haemorrhage, Thrombocytopenia, Vertical transmission

INTRODUCTION

Thrombocytopenia is a second leading cause of blood disorder in pregnancy after anaemia. It is defined as platelet count below 1,50,000/ul. It is a common condition occurring in approximately 7-10% of

pregnancies¹ Most cases are mild and do not have adverse maternal or neonatal outcome. Gestational thrombocytopenia is physiological and occurs in 70-80% of population having platelet count of 1,30,000/ul-1,50,000/ul with no adverse consequences. And it usually occurs in mid-trimester or third trimester. Maternal

platelet count normalizes in 1-2 months after delivery.² Other causes of thrombocytopenia in pregnancy could be immune related like immune thrombocytopenia, thrombotic thrombocytopenia or pregnancy related disorders like hypertensive disorders, eclampsia, HELLP and fatty liver of pregnancy. Immune thrombocytopenia presenting with platelet counts below 20,000-30,000/ul requires prednisolone and/ or intravenous immunoglobulin treatment. Refractory thrombocytopenia requires antimetabolite drugs which can be teratogenic.²

Platelet count of higher than 30,000/ul is considered safe for conducting vaginal delivery as per current guidelines. However, for operative vaginal or caesarean deliveries the safe platelet count is above 50,000/ul. A platelet count of 75,000-80,000/ul is needed for safe epidural anaesthesia.¹

Pregnant ladies can have thrombocytopenia associated with fever which is commonly observed in monsoon season. It could be because of various causes like dengue, malaria, leptospirosis or other viral infections. Thrombocytopenia carries a risk of haemorrhage for both mother as well as newborn. In addition, it carries a risk of vertical transmission leading to premature birth, neonatal thrombocytopenia, intracranial haemorrhage and foetal death.³ There is relatively less information regarding importance of diversity of infectious diseases on pregnancy outcome.

In public sector hospital have retrospectively collected a data of all those pregnant patients who presented with fever and thrombocytopenia during the period of monsoon from 1st June 2019 to 30th September 2019. We came across 14 pregnant patients who presented with fever and thrombocytopenia and their perinatal course was followed till the outcome. This article describes the effect of monsoon related illness on the outcome of pregnancy which is underestimated. There is not only increment in the number of monsoon fever cases in pregnancy but also their effect on maternal and neonatal morbidity and mortality is on rise.

METHODS

The present study was done in public sector hospital of Hinduhridaysamrat Balasaheb Thackeray and Dr. R. N. Cooper Municipal General Hospital by retrospectively collecting data from medical records department.

All pregnant patients who presented with fever and thrombocytopenia during this period were selected and their perinatal course was studied.

Inclusion criteria

- Pregnant patients
- History of fever with thrombocytopenia (Platelet count <1,50,000)
- History of hematuria, petechie, headache, bodyache, and myalgia.

- Patients who has positive fever profile (positive for dengue, malaria, leptospira and enteric fever).

Exclusion criteria

- Patients with pregnancy induce hypertension and having thrombocytopenia.
- Pregnant patients of antepartum or postpartum haemorrhage.
- Pregnant patients who did not present with fever.
- Pregnant patients with immune thrombocytopenic purpura, HELLP syndrome, hypertensive disorder of pregnancy.
- Pregnant patients in septicemia.

Data was collected from medical records department from 1st June 2019 to 30th September 2019. All pregnant patients who presented with fever and thrombocytopenia were included in our study. Demographic data, clinical and laboratory findings and maternal and fetal outcome were recorded. All patients had undergone repeated haemogram and medicine reference. The requirement of platelet transfusions was decided by the attending consultant and decisions were based upon the general condition of the patients. The pregnancy course of all the patients was followed. Whether these patients received platelet transfusion before delivery was noted. The mode of delivery i.e. vaginal or requirement of caesarean section was noted. If operative delivery was done then whether patients received subarachnoid block or were given general anaesthesia in view of low platelet count was recorded. Also all caesarean delivery patients with thrombocytopenia and fever were monitored in our anaesthesia ICU (AICU) and their post-operative course and any complications like postpartum haemorrhage, hematuria, respiratory distress or platelet or blood transfusion was noted. Requirement of post-operative ventilatory care, stay in ICU and recovery was monitored. The babies born to all these patients were followed and any incidence of thrombocytopenia, intracranial haemorrhage, ventilatory requirement or any mortality was noted. Statistical analysis was done and results were drawn accordingly.

RESULTS

During the study period, there were 1387 deliveries and out of which 14 pregnant patients were diagnosed with fever with thrombocytopenia. 1 patient was admitted with thrombocytopenia and fever in second trimester and was observed and discharged later on.

Age

All the patients aged from 20-36 years of age. Out of 14 patients, 9 patients were between 20-25 years age group and rest 1-2 patients in other age groups. There was no significance related to age groups of the patients (Figure 1).

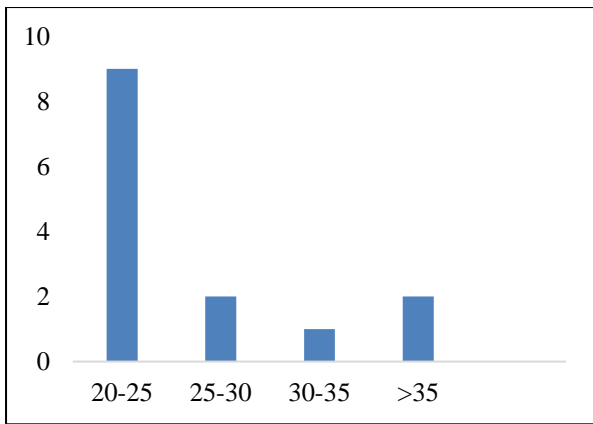


Figure 1: Age distribution of patients.

Fever profile

In this study 11 out of 14 patients had history of fever with thrombocytopenia. Two patients were dengue IgM positive and NS1 antigen positive, one was leptospira IgM positive and two were Widal positive, rest nine patients had negative fever profile. All 14 patients were tested for malarial antigen, dengue antigen, leptospira IgM and for widal test (Figure 2).

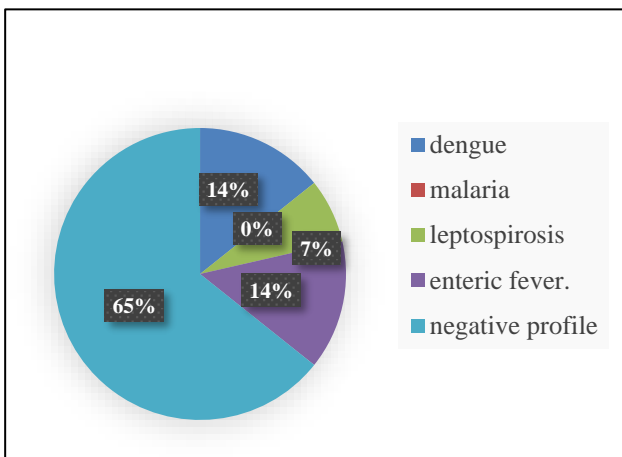


Figure 2: Fever profile.

Out of 14 patients, 2 had dengue fever, 1 was leptospira positive, 2 had enteric fever and 9 had fever with thrombocytopenia with negative fever profile. There was no significance related to type of fever amongst the patients.

Platelet and blood transfusion

Decision of transfusion was taken after medicine consultation by treating obstetrician. All patients with platelet count below 50,000/ul received platelet transfusion. Blood transfusion was done in cases of moderate to severe haemorrhage. 4 patients received platelet transfusion, 3 patients received blood transfusion and 1 patient required plasma transfusion (Figure 3).

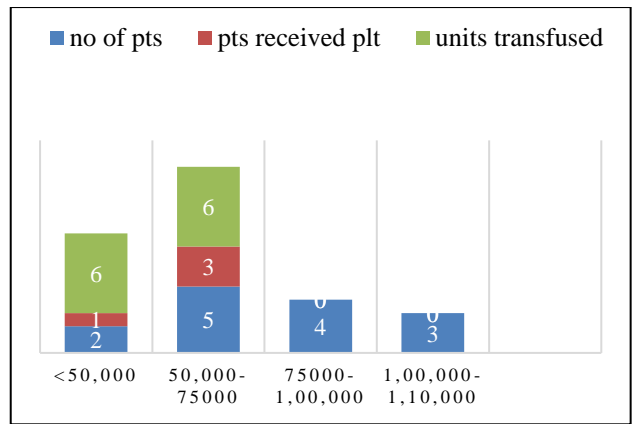


Figure 3: Platelet count and transfusion requirement.

Out of 14 patients only 4 patients received platelet transfusions. 2 patients had platelet count below 50,000 and 5 patients had platelets between 50,000-75,000. All 4 patients received 6 units of random donor platelets perioperatively.

Mode of delivery

Decision of mode of delivery was taken by treating obstetrician depending upon platelet count and any bleeding episode. 5 patients had normal term deliveries, 1 patient had early pregnancy failure, and 7 patients underwent emergency caesarean delivery (Figure 4). 4 out of the caesarean deliveries were done under subarachnoid block and 3 patients were given general anaesthesia in view of platelet count below 50,000/ul.

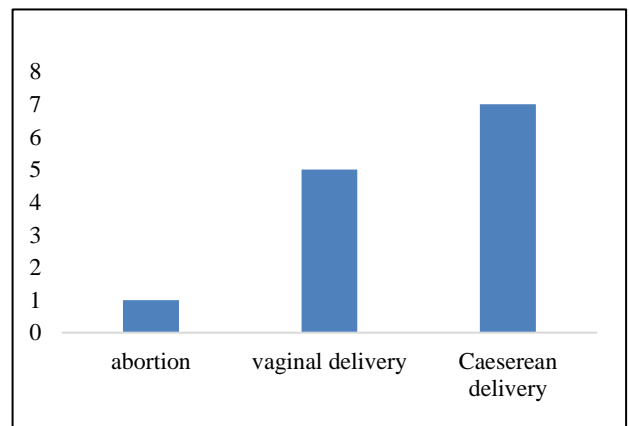


Figure 4: Mode of delivery.

Out of 14 patients, 13 had delivered and one patient went home (came in early pregnancy). There were 5 vaginal deliveries, 7 caesarean sections and one spontaneous abortion.

Neonatal outcome

Neonates were observed whether there was any fetal demise, fetal thrombocytopenis, intracranial death, fetal

thrombocytopenia, and intrauterine death. There was one first trimester abortion, one intrauterine death and one neonate required neonatal ICU stay and observation. Rest 10 neonates had good outcome and were discharged after third day of birth (Figure 5).

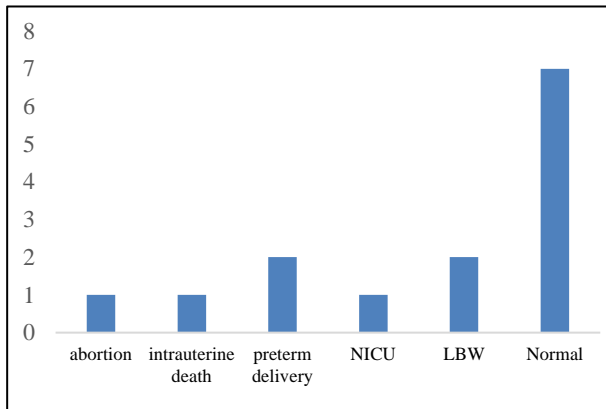


Figure 5: Neonatal outcome.

An 1 patient presented in first trimester and had spontaneous abortion whereas 12 patients presented in third trimester. None of the born babies had bad prognosis except one early pregnancy failure and one intrauterine death.

Complications

Presence of any postpartum haemorrhage, hematuria respiratory distress syndrome, petechie were recorded and treated. One patient presented with hematuria, one had petechie and one patient developed breathlessness post-delivery (Figure 6). Hematuria and petechie was treated with injection tranexamic acid and platelet transfusion. The patient who developed breathlessness had dengue and was observed in AICU for 3 days till symptoms subsided. She was managed on BiPAP mode of ventilation and did not require any invasive ventilatory care. There was no maternal mortality observed in our study period. Postpartum haemorrhage was treated by giving platelet, blood and FFP (fresh plasma) transfusions.

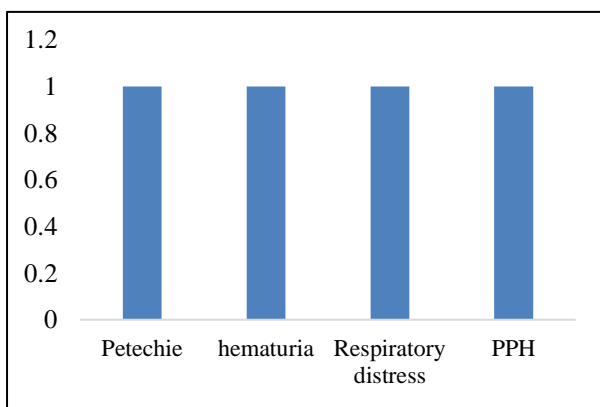


Figure 6: Complications.

There were few complications like petechie, hematuria, respiratory distress and postpartum haemorrhage but no maternal mortality.

DISCUSSION

Thrombocytopenia in 7% of pregnancies may be due to immunological like idiopathic thrombocytopenic purpura (ITP), systemic lupus erythematosus (SLE) and antiphospholipid antibody syndrome (APA syndrome) or due to hypertensive disorders of pregnancy, septicaemia, or disseminated intravascular coagulation. In 70-80% population, thrombocytopenia cannot be related to any of the above-mentioned causes.⁴

But thrombocytopenia associated with fever includes the differential diagnosis of dengue fever, malarial fever, leptospirosis, typhoid fever and other viral fevers. All these monsoon related diseases also add to maternal and fetal outcome. The associated complications of these fevers include, thrombocytopenia leading to spontaneous bleeding, disseminated intravascular coagulation, antepartum and postpartum haemorrhage, respiratory distress syndrome, etc.⁶ They not only lead to maternal complications but also can cause fetal thrombocytopenia, fetal intracranial haemorrhage, early fetal loss, and intrauterine fetal death.

In present study the monsoon disease related thrombocytopenia and its effect on maternal outcome was taken into account. The study was done in one of the municipal hospitals of Mumbai. Mumbai being the economic capital of India, many people from all over India come here in search of job and livelihood. In that way it has become an overpopulated metro city where slum areas are on an increase. The city gets flooded in monsoons due to overwhelming rainfall which leads to water logging and spillage of drainage water on roads and living areas. All these conditions make Mumbai a harbour of monsoon related illness to breed. Dengue, malaria, leptospirosis is few of them. They lead to number of deaths in the city. But along with the general population, pregnant population also gets affected and it finally leads to their morbidity and mortality. The platelet and other product transfusions given during the course of illness have their own complications along with effect of thrombocytopenia on neonatal outcome.

The aim of doing this study was to bring into light the increasing incidence of monsoon related illness over last decade and their impact on maternal outcome. They are becoming an additional factor affecting pregnancy outcome.

In the study, the peripartum course of 14 pregnant patients were studied who presented with fever with thrombocytopenia in monsoon season. 2 patients were dengue positive, 1 was leptospira positive, and 2 were widal positive, and rest 9 patients had negative fever profile (Figure 2). In study done by Haldar A et al, they

retrospectively observed the various causes of maternal mortality and they found that 16.47% of pregnant population had pregnancy related infections. They observed dengue (3%), malaria (2.8%), scrub typhus (2.8%), H1N1 (2.8%), herpes zoster (0.4%) as the major causes of maternal infections contributing to their mortality.⁷ Meena NS et al conducted a similar study in KEM hospital Mumbai over a period of 5 years from 2011 to 2016 and they collected data about maternal deaths that occurred due to infectious causes. They found that out of total 37,266 deliveries over 5 years, there were 23.58% maternal deaths due to infectious diseases. Out of which malaria (8.33%), dengue (6.25%), leptospirosis (3.12%) and swine flu (5.2%). It was concluded that infectious causes are indirect obstetric causes of maternal mortality.⁸

In an observational study done by Geeta et al, they studied the various causes of maternal mortality in tertiary care hospital in New Delhi. They found that maternal deaths due to indirect causes mostly HEV infection was 77% signifies poor sanitation and due to direct causes was 23% out of which sepsis accounted 75% highlighting poor infection control facilities in the primary health centres. They had given various interventions and solutions to reduce maternal mortality.⁹

In a retrospective study on maternal mortality done by Rushali et al over a 5 year period in tertiary hospital in Nagpur found infectious diseases as an indirect cause of maternal mortality accounting to 15.7% which although was lower to direct causes. They reported that dengue (1.3%), malaria (1.6%), H1N1 (0.33%) and typhoid (0.33%). Out of all indirect causes of maternal mortality, infectious diseases contribute to maximum percentage.¹⁰

Out of 14 patients, 7 patients had full term normal vaginal deliveries, 7 patients underwent emergency caesarean deliveries and one had early pregnancy failure (Figure 4). 4 out of 7 patients had caesarean under subarachnoid block and 3 patients received general anaesthesia due to low platelet count. 4 out of 14 patients received platelet transfusions to avoid the risk of bleeding and 3 patients received blood transfusion (Figure 3). 1 patient had haematuria, 1 had petechiae and 1 patient had breathlessness post -delivery (Figure 6).

All babies were fine except 3 out of which 1 was an intrauterine death (IUID), 1 was first trimester abortion and 1 neonate was shifted to neonatal ICU in view of preterm delivery and low birth weight of 1.59 kg (Figure 5). The patient who had IUID had fever with platelet count of 36,000/ul which gradually increased to 67,000/ul. She had a retroplacental clot with abruptio placenta. She required 4 fresh plasma and 5 whole blood in her entire course of ICU stay. The risk of haemorrhagic fever, its complications, peripartum haemorrhage.^{5,6} Singh N et al, had reported two cases of dengue fever in pregnancy in which one patient had postpartum haemorrhage and other case had perinatal

transmission requiring neonatal platelet transfusions: Platelet transfusion was given in the first case.¹¹ The complications of multiple transfusions all add to the wellbeing and prognosis of the patient.

Bailey et al, found that in a survey in 2007 at Mozambique, 18% of pregnant women were positive for malaria. Malaria being endemic there, has negative impact on pregnancy outcome including maternal anaemia, low birth weight, fetal growth retardation, preterm delivery, spontaneous abortion stillbirth and neonatal death.¹²

There was no maternal mortality though but the additional morbidities like caesarean delivery, transfusion, prolonged hospital stay and intensive care requirement was there.

The limitation of the study was that it was conducted in a single municipal hospital so the exact incidence of monsoon related fever with thrombocytopenia and its effect on maternal mortality could not be assessed. Therefore, another multicentre study including all the metro cities should be conducted. The aim of our study was to bring into light the importance of hygiene, cleanliness and surveillance before monsoon of areas likely to suffer from monsoon fever and to generate awareness for its prevention.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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