



## PREVALENCE OF GESTATIONAL THROMBOCYTOPENIA IN ANTENATAL WOMEN FOLLOWING COVID-19 INFECTION AT A TERTIARY CARE CENTER IN EASTERN UTTAR PRADESH- AN OBSERVATIONAL STUDY

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### Abstract

**Background:** Thrombocytopenia during pregnancy, particularly gestational thrombocytopenia, can complicate maternal and fetal outcomes. Recent evidence suggests a potential link between COVID-19 infection and hematological abnormalities, including thrombocytopenia. This study aims to assess the prevalence and severity of gestational thrombocytopenia among antenatal women with a history of COVID-19 infection in Eastern Uttar Pradesh.

**Methods:** An observational study was conducted at Government Medical College Azamgarh from January to December 2023, involving 1,000 antenatal women screened for thrombocytopenia. Participants with confirmed COVID-19 infection via RT-PCR or rapid antigen test were included. Data on platelet counts, obstetric outcomes, and complications were collected and analyzed.

**Results:** Of the 1,000 women screened, 250 (25%) exhibited thrombocytopenia, with 200 diagnosed as having gestational thrombocytopenia. The prevalence of thrombocytopenia was influenced by underlying conditions such as pregnancy-induced hypertension and infections. The majority had mild to moderate thrombocytopenia, with only a small fraction experiencing severe forms. Most women delivered vaginally, with a low incidence of complications such as postpartum hemorrhage and need for transfusions.

**Conclusion:** Gestational thrombocytopenia is prevalent among pregnant women with prior COVID-19 infection, predominantly presenting as mild to moderate. While severe complications are rare, close monitoring is essential to optimize maternal and fetal outcomes. Larger multicenter studies are warranted to further elucidate the relationship between COVID-19 and thrombocytopenia during pregnancy.

**Key words-** Gestational Thrombocytopenia, COVID-19 Infection, Pregnancy, Thrombocytopenia Prevalence, Antenatal Women

### Introduction:

Platelets are anucleate blood cells derived from megakaryocyte fragments that play a crucial role in hemostasis and maintaining vascular integrity.<sup>1</sup> Thrombocytopenia is generally suspected when a patient's platelet count drops below  $150,000 \times 10^3/\text{mm}^3$ . The normal platelet count range in

nonpregnant women is approximately  $150,000$  to  $400,000 \times 10^3/\text{mm}^3$ . During pregnancy, physiological changes such as hemodilution—caused by increased plasma volume—can lead to a mild decrease in platelet counts, typically by around 10%. Most of this decline occurs during the third trimester, yet in most cases, the platelet count remains within the normal reference range.<sup>2-6</sup>

Recent evidence suggests that COVID-19 infection may have hematological implications, including thrombocytopenia, which could potentially influence pregnancy outcomes.<sup>7,8</sup> The virus's impact on platelet counts in pregnant women remains an area requiring further exploration. Understanding the prevalence and characteristics of gestational thrombocytopenia in women post-COVID-19 infection is essential for early diagnosis, appropriate management, and improving maternal-fetal outcomes. This study aims to determine the prevalence of gestational thrombocytopenia among antenatal women with a history of COVID-19 infection. Additionally, it seeks to evaluate the severity of thrombocytopenia, assess associated obstetric outcomes, and identify any correlations between prior COVID-19 infection and changes in platelet counts during pregnancy.

## Methodology

This observational study was conducted at Government Medical College Azamgarh, Eastern Uttar Pradesh, from January 2023 to December 2023. The primary objective was to assess the prevalence of gestational thrombocytopenia among antenatal women following COVID-19 infection.

**Sample Size and Participant Selection:**

A total of 1,000 antenatal women were screened for thrombocytopenia during the study period. Participants were selected based on the following criteria:

- Inclusion Criteria: Pregnant women with a confirmed history of COVID-19 infection documented via RT-PCR or rapid antigen test).
- Exclusion Criteria: Pregnant women without a history of COVID-19 infection.

Data were collected through clinical examinations and laboratory investigations, including platelet counts. The severity of thrombocytopenia was classified into mild, moderate, and severe based on platelet count thresholds.

## Data Collection and Analysis:

Data collection involved detailed history-taking, clinical examination, and laboratory investigations, including complete blood counts to assess platelet levels. Thrombocytopenia was classified based on platelet counts into mild ( $100,000$  to  $<150,000/\mu\text{L}$ ), moderate ( $50,000$  to  $<100,000/\mu\text{L}$ ), and severe ( $<50,000/\mu\text{L}$ ). Ref meth

Demographic data, gestational age at diagnosis, mode of delivery, underlying conditions, severity of thrombocytopenia, and complications were recorded. The distribution of patients was analyzed using descriptive statistics. Graphs and tables were used to illustrate the age-wise distribution, gestational age at diagnosis, severity, mode of delivery, and complications.

## Results

A total of 1,000 antenatal women were screened for thrombocytopenia, of whom 250 (25%) exhibited thrombocytopenia. Among these, 200 women were diagnosed with gestational thrombocytopenia. The distribution of underlying conditions among women with thrombocytopenia is summarized in Table 1.

**Table 1: Distribution of Antenatal Women by Underlying Conditions and Thrombocytopenia**

|                                                                     |     |
|---------------------------------------------------------------------|-----|
| Total number of antenatal women with thrombocytopenia               | 250 |
| Number of antenatal women with Gestational thrombocytopenia         | 200 |
| Number of antenatal women with Pregnancy-Induced Hypertension (PIH) | 37  |
| Number of antenatal women with Infection or Sepsis                  | 08  |

|                                                                             |    |
|-----------------------------------------------------------------------------|----|
| Number of antenatal women with Disseminated Intravascular Coagulation (DIC) | 03 |
| Number of antenatal women with Systemic Lupus Erythematosus (SLE)           | 01 |
| Number of antenatal women with Malignancy                                   | 01 |

**Figure 1: Age wise distribution of participants**

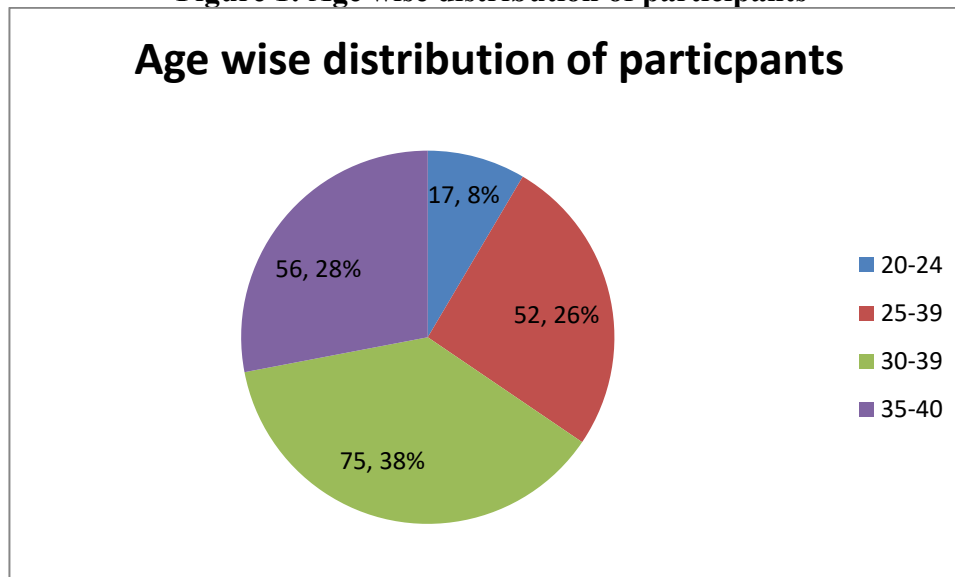


Figure 1 illustrates the age-wise distribution of the participants, while Figure 2 depicts the distribution based on gestational age at diagnosis.

**Figure 2: Number of patients based on gestational age at diagnosis**

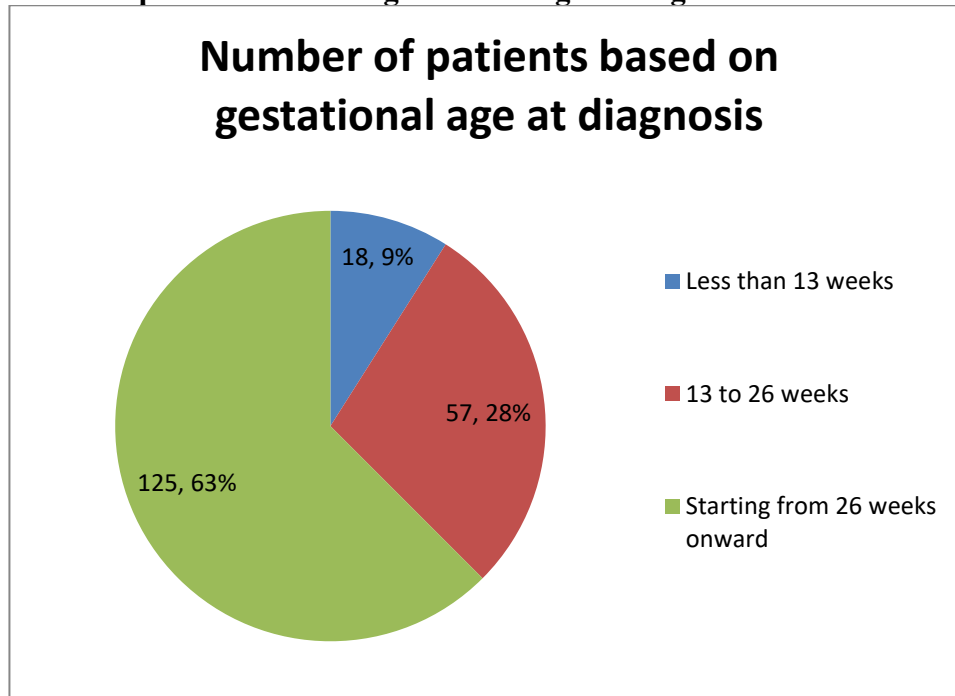


Figure 2 illustrates the distribution based on gestational age at diagnosis.

**Table 2: Distribution of Patients by Severity of Thrombocytopenia**

| Severity of thrombocytopenia | Platelet count/microliter | No of patients |
|------------------------------|---------------------------|----------------|
| Mild                         | 100000 to <150000         | 118            |
| Moderate                     | 50000 to <100000          | 57             |

|        |        |    |
|--------|--------|----|
| Severe | <50000 | 25 |
|--------|--------|----|

The severity of thrombocytopenia among the affected women was categorized as follows (Table 2):

**Figure 3: Distribution of Patients by Mode of Delivery**

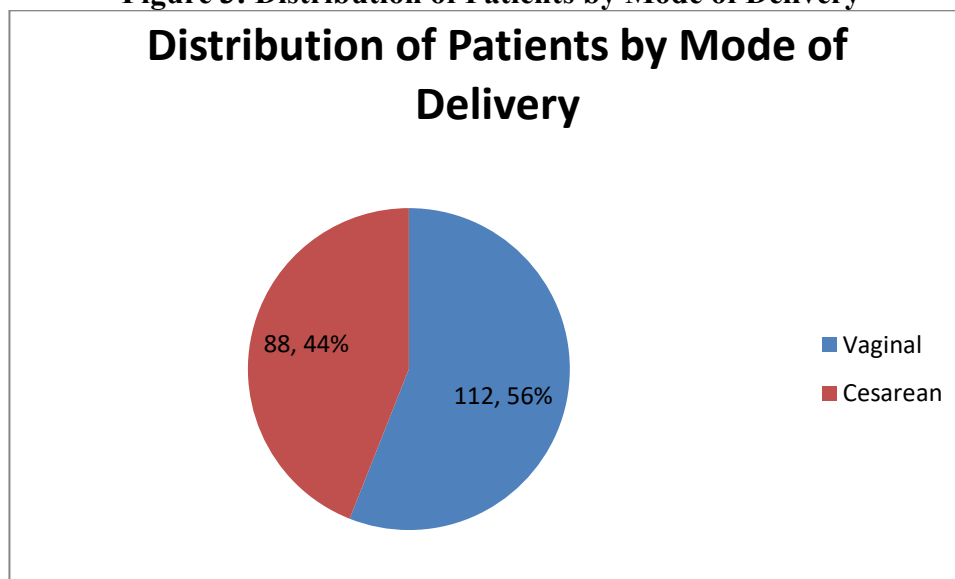


Figure 3 shows the distribution of patients based on the mode of delivery. The majority of women delivered vaginally, while some underwent cesarean sections.

**Table 4: Distribution as per Complications**

|                      |     |
|----------------------|-----|
| No complications     | 130 |
| PPH                  | 25  |
| Sepsis               | 12  |
| Petechiae / Bruising | 10  |
| Blood transfusion    | 25  |
| Platelet transfusion | 40  |

The occurrence of maternal and neonatal complications is summarized in Table 4:

This data indicates that gestational thrombocytopenia was prevalent among women with a history of COVID-19 infection, with the majority presenting with mild to moderate thrombocytopenia and a relatively low incidence of severe complications.

## Discussion

A total of 1,000 antenatal women were screened for thrombocytopenia, with 25% (250 women) affected. This prevalence aligns with recent meta-analyses reporting a pooled prevalence of approximately 22.9% (95% CI 4.8–41.0%) [7]. Notably, gestational thrombocytopenia was more common among women with a history of COVID-19 infection, which was predominantly mild to moderate, with few severe complications. This suggests that while thrombocytopenia is relatively prevalent in this population, it rarely results in adverse maternal or fetal outcomes. Similar findings have been documented in a study conducted at a tertiary care hospital in Delhi [9].

A comprehensive meta-analysis involving over 138,000 COVID-19 patients indicated that pregnant women (average age 33 years, at around 36 weeks gestation) exhibit clinical symptoms comparable to non-pregnant adults, although they tend to experience less cough, fatigue, and sore throat. Interestingly, pregnant women also demonstrated higher rates of leukocytosis and

thrombocytopenia, but lower levels of C-reactive protein, suggesting differential inflammatory responses [10].

Emerging evidence has identified a potential association between COVID-19 vaccination and thrombocytopenia in pregnant women. While most cases are mild, these findings underscore the importance of vigilant antenatal monitoring to enable early detection and prompt management, thereby reducing associated risks [11]. In asymptomatic COVID-19 cases, thrombocytopenia generally remains mild but can be exacerbated by conditions such as gestational thrombocytopenia, preeclampsia, or HELLP syndrome. These conditions can complicate anesthesia management, increase bleeding risks, and signify disease progression, emphasizing the need for close monitoring and preoperative coagulation assessments [12]. Additionally, guidelines recommend careful observation and prompt treatment of COVID-19-associated thrombocytopenia to prevent potential complications [13].

Furthermore, COVID-19 infection during pregnancy has been associated with adverse maternal and neonatal outcomes, including increased mortality and morbidity, highlighting the critical need for preventive strategies and comprehensive care [14].

On a broader public health level, India has achieved the National Health Policy (NHP) 2017 target of reducing maternal mortality ratio (MMR) to below 100 per 100,000 live births by 2020 and is committed to reaching the Sustainable Development Goals (SDG) target of 70 by 2030. Strengthening healthcare infrastructure and addressing socioeconomic barriers are vital components for further reducing maternal mortality [15].

In conclusion, our findings emphasize the necessity for larger, multicenter studies to better elucidate the relationship between COVID-19 and thrombocytopenia during pregnancy. Such research will be instrumental in informing clinical guidelines aimed at improving maternal and fetal outcomes in this vulnerable population.

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