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Migraine Patterns During Pregnancy and Postpartum: A Prospective Cross-Sectional Study

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ABSTRACT

Background: Migraine is a common neurological disorder, particularly among women of reproductive age. Pregnancy and the postpartum period involve hormonal, physiological, and lifestyle changes that may influence the onset, frequency, and severity of migraine attacks. Understanding migraine patterns and management strategies in this population is essential for optimizing maternal and fetal outcomes. This study investigates the clinical features, triggers, and treatment approaches of migraine among pregnant and postpartum women attending a tertiary care hospital.

OBJECTIVES: To assess the frequency, severity, triggers, and treatment practices of migraine among pregnant and postpartum women attending a tertiary care hospital.

METHODS: A prospective cross-sectional observational study was conducted over a three-month period (April to June 2025) in the Department of Obstetrics and Gynaecology at Varun Arjun Medical College and Rohilkhand Hospital, Shahjahanpur. A total of 40 participants clinically diagnosed with migraine were enrolled. Data were collected using structured proformas and face-to-face interviews. Descriptive analysis was performed using frequency and percentage distribution for demographic, clinical, and treatment-related variables.

RESULTS: The 25–30 years age group was most common (n=18, 45%). Primigravida women accounted for 55% (n=22). Migraine episodes occurred most frequently in the postpartum period (n=14, 35%) and third trimester (n=12, 30%). Moderate severity was observed in 18 participants (45%), severe in 16 (40%), and mild in 6 (15%). Sleep deprivation was the most reported trigger (n=22, 55%), followed by emotional stress (n=19, 47.5%) and hormonal fluctuations (n=16, 40%). Paracetamol was used by 25 women (62.5%), non-pharmacological methods by 20 (50%), and triptans by 1 (2.5%). Preterm delivery was observed in 5 participants (12.5%), low birth weight in 3 (7.5%), and NICU admission in 2 (5%). No complications occurred in 30 cases (75%).

CONCLUSIONS: Migraine during pregnancy and postpartum is commonly moderate to severe and predominantly triggered by sleep and stress-related factors. Early recognition and tailored management can support better maternal and fetal outcomes.

Key words: Migraine, Pregnancy, Postpartum, Triggers, Analgesics, Maternal outcome

Introduction

Migraine is a common primary headache disorder characterized by recurrent attacks of moderate to severe pulsating pain, often accompanied by nausea, vomiting, photophobia, and phonophobia. It disproportionately affects women, especially during their reproductive years, due to complex hormonal influences on neurovascular pathways [1,2]. The burden of migraine in women is further exacerbated during pregnancy and postpartum periods, which are marked by substantial hormonal, physiological, and emotional changes [3,4].

Pregnancy is often perceived as a protective phase against migraine for many women, particularly those suffering from menstrual migraine, with reports indicating improvement in the second and third trimesters [5,6]. However, this is not universal; a significant proportion of pregnant women continue to experience migraines, and some may encounter worsening symptoms or new-onset migraine during gestation or postpartum [7,8]. The postpartum period, characterized by sudden estrogen withdrawal, sleep deprivation, and psychological stress, can also lead to a resurgence or intensification of migraine episodes [9,10].

Management of migraine during pregnancy is challenging due to limitations on pharmacologic interventions imposed by concerns over fetal safety. Many commonly used migraine medications, such as triptans, ergot derivatives, and some nonsteroidal anti-inflammatory drugs, are either contraindicated or used with caution [11,12]. Consequently, obstetricians and neurologists must often rely on non-pharmacological therapies and safer drug alternatives, demanding an individualized approach to treatment [13].

Recent studies have shown that untreated or poorly managed migraines during pregnancy are associated

with adverse maternal outcomes such as preeclampsia, preterm labor, and increased hospital admissions, as well as potential fetal consequences including low birth weight and neonatal intensive care unit (NICU) admissions [14,15]. However, despite the clinical relevance, data on migraine patterns, triggers, and treatment strategies during pregnancy and postpartum in Indian women remain limited.

Justification of the Study

There is limited Indian data on migraine patterns during pregnancy and postpartum, despite its significant impact on maternal health. Current clinical practices often lack structured assessment and individualized management, especially due to concerns over drug safety. This study is necessary to fill this gap by documenting migraine characteristics, triggers, and treatment approaches in this population, thereby aiding in improved, evidence-based maternal care.This study aims to explore migraine patterns among pregnant and postpartum women in a tertiary care hospital setting, providing much-needed local data to guide clinical decisions and promote safer, individualized management protocols.

Purpose of the Study

The purpose of this study is to systematically assess the frequency, severity, triggering factors, and treatment strategies of migraine among pregnant and postpartum women attending a tertiary care hospital. By identifying clinical patterns and management practices in this specific population, the study aims to provide evidence that can enhance patient-centered care, promote safe therapeutic decision-making, and support the development of guidelines tailored to maternal health needs in the Indian context.

Material and Methods

This prospective cross-sectional observational study was conducted over a duration of three months, from April to June 2025, in the Department of Gynaecology and Obstetrics at Varun Arjun Medical College and Rohilkhand Hospital, Shahjahanpur. Ethical approval was obtained from the Institutional Ethics Committee (Ref. No. IEC/VAMC/OG/003/Mar2025) prior to the initiation of the study. A total of 40 pregnant or postpartum women clinically diagnosed with migraine were enrolled during routine clinical visits to the outpatient and inpatient departments. Participants were recruited after obtaining written informed consent.

Inclusion Criteria:

- Pregnant or postpartum women diagnosed with migraine
- Presenting to the outpatient or inpatient departments during the study period
- Willingness to provide informed consent

Exclusion Criteria:

- Known neurological disorders other than migraine
- Severe complications requiring ICU admission
- Refusal to participate or incomplete clinical data

Data were collected prospectively using a structured form and face-to-face interviews. Information gathered included maternal demographics (age, gestational age, parity), migraine characteristics (frequency, duration, and intensity), common triggers such as stress, hormonal fluctuations, sleep disturbances, and dietary factors, as well as associated symptoms like nausea, vomiting, photophobia, and phonophobia. Treatment details including pharmacologic (analgesics, prophylactics) and non-pharmacologic interventions were also recorded. Maternal outcomes (hospital stay, treatment response, medication changes) and fetal outcomes (preterm birth, birth weight, NICU admission) were assessed.

All data were entered into Microsoft Excel and analyzed using descriptive statistical methods. Continuous variables were summarized as mean, median, and standard deviation, while categorical variables were expressed as frequencies and percentages. Where relevant, chi-square tests or logistic regression were applied to identify associations. Confidentiality of all participants was maintained by anonymizing personal identifiers and securely storing the data.

Results

A total of 40 women participated in the study, including 26 pregnant (65%) and 14 postpartum women (35%). The most represented age group was 25–30 years (45%), followed by 31–35 years (25%), while the smallest age group was women aged above 35 years (10%) (Table 1 & Graph 1). Primigravida women accounted for the majority (55%) compared to multigravida women (45%). Among the stages of pregnancy, the highest proportion of cases was seen during the postpartum period (35%), followed by the third trimester (30%) (Table 1 & Figure 1). The lowest representation was from women in their first trimester (12.5%) (Table 1 & Figure 1).

Table 1: Demographic Profile of Participants

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	18–24	8	20%
	25–30	18	45%
	31–35	10	25%
	>35	4	10%
Gravida Status	Primigravida	22	55%
	Multigravida	18	45%
Pregnancy Stage	First Trimester	5	12.5%
	Second Trimester	9	22.5%
	Third Trimester	12	30%
	Postpartum	14	35%

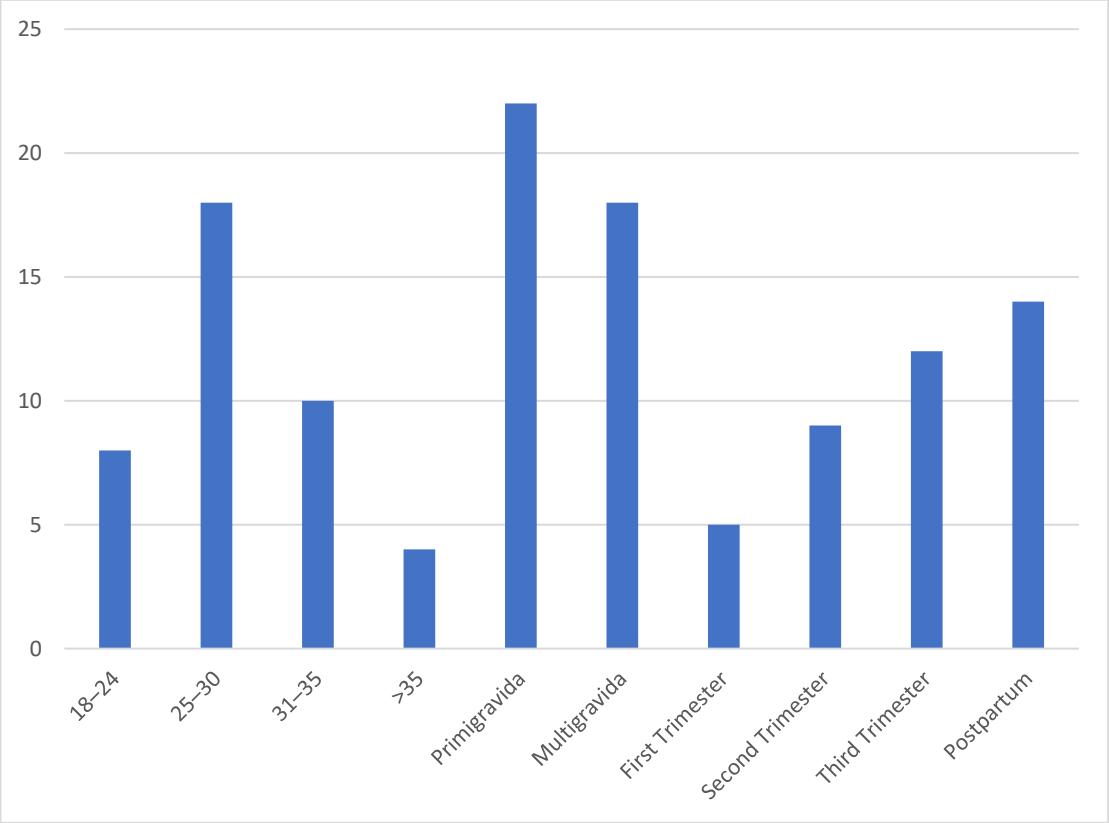


Figure 1: Demographic Profile of Participants

Out of the total participants, 18 women (45%) experienced moderate migraine episodes, making it the most frequently reported severity (Table 2 & Figure 2).. This was followed by 16 participants (40%) who experienced severe episodes (Table 2 & Figure 2).. Mild migraine attacks were least common, reported by only 6 women (15%) (Table 2 & Figure 2).

Table 2: Severity of Migraine Episodes

Severity	Frequency (n)	Percentage (%)
Mild	6	15%
Moderate	18	45%
Severe	16	40%

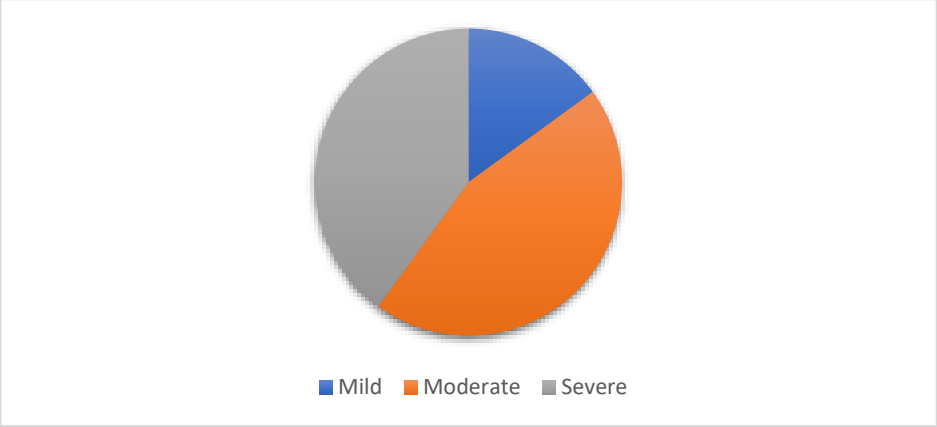


Figure 2: Severity of Migraine Episodes

Among the identified migraine triggers, sleep deprivation was the most frequently reported factor (55%), followed closely by emotional stress (47.5%) and hormonal fluctuations (40%) (Table 3 & Figure 3). Skipped meals were reported as a trigger by 27.5% of participants (Table 3 & Figure 3). The least reported trigger was weather change, noted by 7 women (17.5%) (Table 3 & Figure 3).

Table 3: Trigger Factors

Trigger	Frequency (n)	Percentage (%)
Sleep deprivation	22	55%
Emotional stress	19	47.5%
Hormonal fluctuations	16	40%
Skipped meals	11	27.5%
Weather changes	7	17.5%

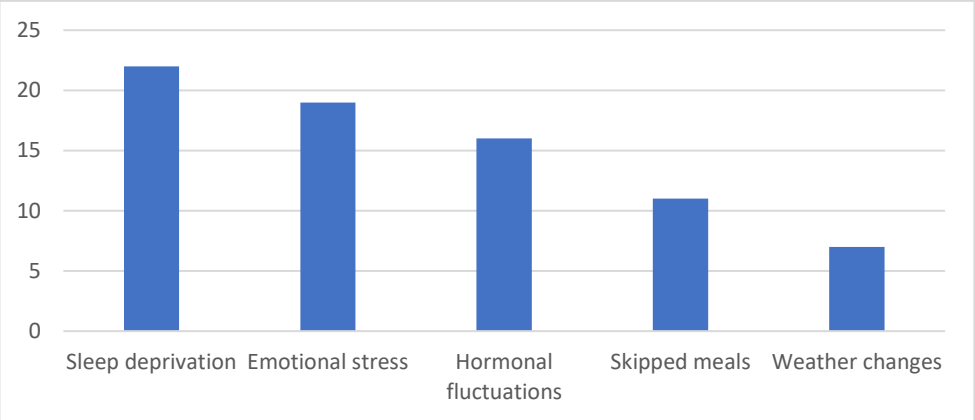


Figure 3: Trigger Factors

Paracetamol was the most commonly used treatment, administered to 25 participants (62.5%) (Table 4 & Figure 4). Non-pharmacological approaches such as rest, hydration, and cold compresses were used by 20 participants (50%) (Table 4 & Figure 4). Anti-emetics were used in 25% of cases (Table 4 & Figure 4). Magnesium supplementation was used in 10% of cases, while triptans were used by only one participant (2.5%), marking the least used treatment modality (Table 4 & Figure 4).

Table 4: Treatment Strategies

Treatment	Frequency (n)	Percentage (%)
Paracetamol	25	62.5%
Non-pharmacological methods	20	50%
Anti-emetics	10	25%
Magnesium supplementation	4	10%
Triptans	1	2.5%

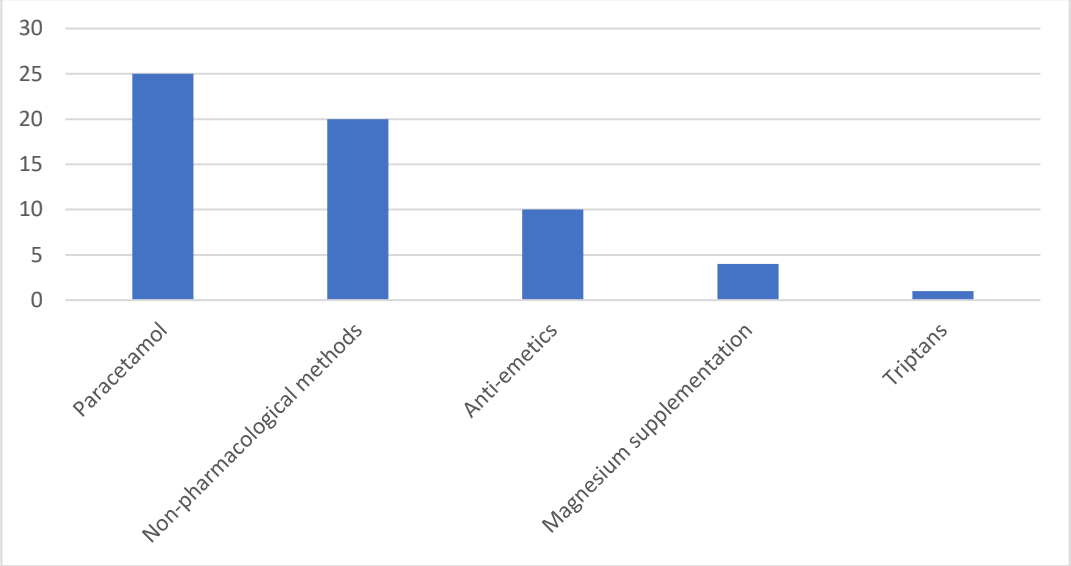


Figure 4: Treatment Strategies

Out of the total participants, 30 women (75%) had no maternal or fetal complications (Table 5 & Figure 5). Preterm delivery occurred in 5 cases (12.5%), while 3 newborns (7.5%) had low birth weight (<2.5 kg) (Table 5 & Figure 5). NICU admissions were reported in 2 cases (5%), representing the lowest recorded adverse outcome (Table 5 & Figure 5).

Table 5: Maternal and Fetal Outcomes

Outcome	Frequency (n)	Percentage (%)
No complications	30	75%
Preterm delivery	5	12.5%
Low birth weight	3	7.5%
NICU admission	2	5%

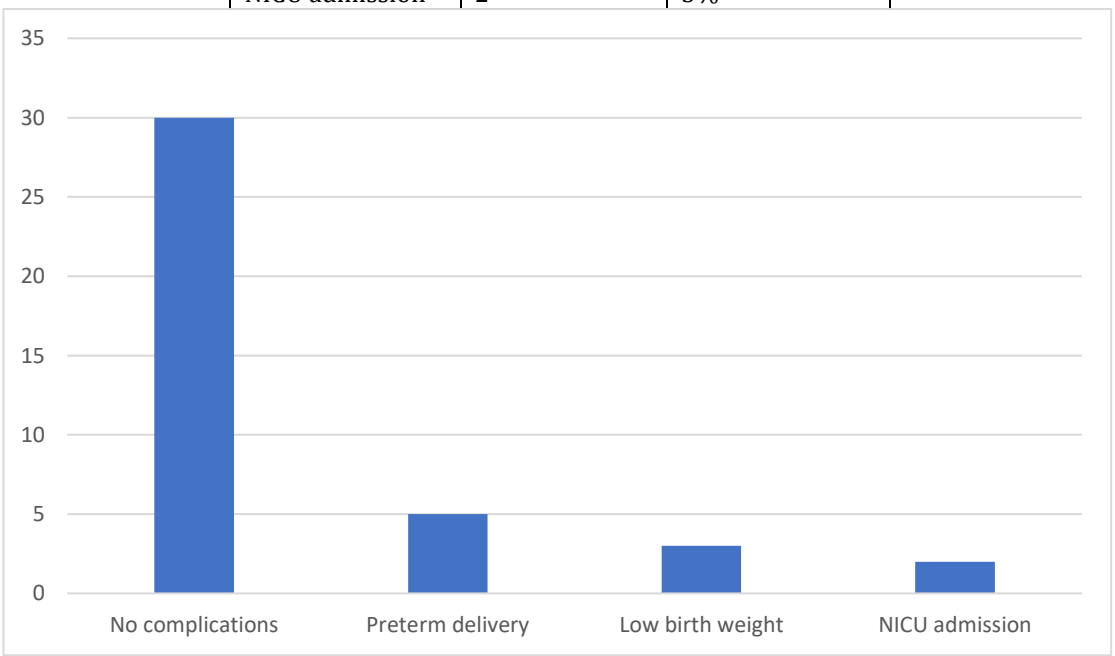


Figure 5: Maternal and Fetal Outcomes

Discussion

This study explored the frequency, severity, triggers, and treatment approaches for migraine among pregnant and postpartum women in a tertiary care setting. The predominance of moderate-to-severe migraine episodes in the third trimester and postpartum period is notable. This finding is supported by Kardes G et al, who reported that migraine attacks may intensify postpartum due to abrupt hormonal shifts and poor sleep quality [16].

Similarly, Kvisvik et al. observed heightened migraine activity in the early postnatal period, attributing it to estrogen withdrawal and stress [17]. The high frequency of sleep deprivation (55%) and emotional stress (47.5%) as triggers in our cohort is consistent with the observations by Alharthi TS et al, who emphasized the underestimated impact of environmental and psychosocial factors on migraine during pregnancy [18]. Granella et al. also identified lifestyle disruptions, particularly irregular sleep and dietary habits, as major contributors to perinatal migraine exacerbation [19].

Hormonal fluctuations, reported by 40% of participants in our study, align with the findings of Sacco et al, who explained that estrogen sensitivity can activate trigeminovascular pathways, leading to migraine onset or worsening during reproductive transitions [20].

Regarding treatment, the preference for paracetamol (62.5%) is in agreement with MacGregor et al., who identified it as the most commonly prescribed analgesic during pregnancy due to its relative safety profile [21]. The low use of triptans (2.5%) may reflect caution, although studies by Nezvalová-Henriksen et al. and Verschoor et al. suggest that certain triptans may be used safely under medical supervision [22,23].

In terms of outcomes, our relatively low incidence of preterm birth (12.5%) and NICU admissions (5%) is less than that reported by Facchinetti et al., who found a stronger association between migraine and adverse obstetric events [24]. This discrepancy may be explained by differences in sample size, antenatal care standards, and timing of diagnosis. Bushnell et al. also reported increased vascular risk in migraineurs during pregnancy, though emphasized the role of comorbidities, which were not assessed in our study [25].

A strength of this study is its prospective design, which minimized recall bias and allowed direct clinical observation. Including both pregnant and postpartum women provided a broader understanding of migraine patterns across reproductive phases. However, limitations include a small sample size, single-center data, and absence of migraine disability scoring (e.g., MIDAS, HIT-6), which may have limited the assessment of the full clinical burden.

Future studies should aim for larger, multicenter cohorts with longitudinal follow-up and objective migraine severity assessments. Incorporating hormonal profiling, sleep quality indices, and validated headache scales may enhance clinical relevance. As suggested by Smelt et al., use of structured disability tools like MIDAS can improve treatment planning and research comparability.

In conclusion, this study highlights the moderate-to-severe nature of migraine in late pregnancy and postpartum, with sleep disruption and emotional stress as predominant triggers. Most women were managed conservatively with paracetamol and non-pharmacologic methods. These findings support the need for integrating headache screening and management into routine antenatal and postnatal care to reduce maternal discomfort and optimize fetal outcomes.

Conclusion

The present study underscores the clinical significance of migraine in pregnancy and postpartum, with identifiable triggers and varied therapeutic approaches. While most women experienced moderate-to-severe symptoms, adverse maternal or fetal outcomes were limited. These findings support the need for structured migraine screening during antenatal visits and tailored management strategies that prioritize maternal and fetal safety. Strengthening awareness among obstetricians and integrating headache assessments into routine care may optimize outcomes in this unique population.

Conflicts of Interest

The authors declare no conflicts of interest related to this study.

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Abbreviations

- **NICU** – Neonatal Intensive Care Unit
- **HIT-6** – Headache Impact Test-6
- **MIDAS** – Migraine Disability Assessment Scale
- **n** – Number of participants
- **%** – Percentage
- **mg** – Milligram

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