Original Article

Hypertensive Disorders of Pregnancy Across the Range of Gravidity

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Article Info

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Date Received:
02nd May, 2025
Date Revised:
16th December, 2025
Date Accepted:
21st December, 2025

Abstract

Objective: To compare the pre-eclampsia and eclampsia frequency in Primigravida and multigravida women who presented to the labor room of Saidu Teaching Hospitals, Swat.

Methodology: The study was a retrospective cross-sectional case study between 1st January 2024 to 31st December 2024 involving 12498 admissions to the labor room by pursuing the convenience sampling method. Pregnant women who had either eclampsia and/or pre-eclampsia and were aged at ≥18 years during the time of study in the labor room were the study subjects. The study excluded patients having protein losing enteropathy, conditions of uric acid or disorders of the kidneys such as nephrotic syndrome, diabetes Mellites and liver diseases. Statistical analysis included descriptive statistics, chi square test, and odds ratio calculations to compare the prevalence of hypertensive disorders between Primigravida and multigravida women.

Results: The frequency of preeclampsia and eclampsia was 3.3% among Primigravida women and 12.8% among multigravida women ($p<0.05$). Women who had more than one pregnancy were much more likely to get these conditions, especially those over 35 years old. Limited access to antenatal care and increasing maternal age were recognized as significant factors contributing to the elevated prevalence among multigravida women.

Conclusion: In this study, multigravida women are substantially more likely to experience hypertensive disorders during pregnancy. The results show that improved prenatal care is necessary to effectively address the increasing burden of these conditions.

Keywords: Eclampsia, Gravidity, Hypertension, Multigravida, Pre-eclampsia, Prenatal Care, Primigravida.

This article may be cited as:
Naveed P, Ikram T, Parveen S, Ali S, Fehmida, Ahmad U. Hypertensive disorders of pregnancy across the range of gravidity. J Postgrad Med Inst. 2025;39(4):278-82. http://doi.org/10.54079/jpmi.39.4.3637

Introduction

Pregnancy-related hypertensive disorders, such as pre-eclampsia and eclampsia, pose serious health risks to mothers and contribute significantly to the morbidity and mortality of mothers and newborns worldwide1. One After 20 weeks of pregnancy, these conditions are characterized by the development of proteinuria and hypertension; eclampsia is a severe manifestation that includes seizures. These conditions continue to be the main cause of unfavorable outcomes despite improvements in prenatal care, especially in low- and middle-income nations.[1,2]

Preeclampsia, which has historically been linked to immunological maladaptation in primigravida women, is increasingly being identified in multigravida women as well. The epidemiological trends have changed due to factors like increasing maternal age, comorbidities, and intervals between pregnancies.[3,4] This has prompted inquiries about how parity affects the frequency and severity of these conditions, calling for a more thorough comprehension of their distribution and contributing factors.[5]

The limited comparison of the incidence and risk factors of pre-eclampsia and eclampsia between primigravida and multigravida women, especially in Pakistan's low-resource setting, represents a major gap in the literature. Due to their increased risk, primigravida women have historically been the focus of research, but new data shows that multigravida women are increasingly at risk for hypertensive disorders, particularly when it comes to advanced maternal age, comorbidities, and intervals between pregnancies.[4,5]

Furthermore, there is a significant knowledge gap regarding parity-specific trends and their implications in settings with limited resources, where access to high-quality prenatal care is frequently subpar, because most of the current research is focused on high-income nations.[6–8] The development of focused prenatal care strategies and policies is hampered by the absence of context-specific data. Furthermore, the interaction between parity, clinical outcomes and healthcare disparities has not been adequately explored in these populations, making it difficult to address the unique needs of multigravida women effectively.[9,10]

This study aims to fill these gaps by comparing the incidence of pre-eclampsia and eclampsia among Primigravida and multigravida women in tertiary care settings, contributing to localized data that can inform clinical practice and public health interventions.

The objective of this study is to compare the incidence of preeclampsia and eclampsia in Primigravida and multigravida women presenting to labor room of Gynea/Obs Department of Saidu Teaching Hospitals, Swat, KP, Pakistan.

Methodology

A retrospective, observational, cross-sectional study was designed analyzing data from 12498 admissions to the labor room of Gynecology & Obstetrics Department of Saidu Teaching Hospital Swat Khyber Pakhtunkhwa Pakistan, from 1st Jan 2024 to 31st Dec 2024. The data was collected from the department of gynae/obs of Saidu teaching hospital, Swat, by convenience sampling method, on the basis of the institutional ethical approval, i-e; (21-ERB/SMC/025, 24/01/2025). Written informed consent was waived due to the retrospective nature of study. Data on maternal age, parity and diagnosis of pre-eclampsia and eclampsia were collected. The outcome variables were to look for preeclampsia and eclampsia among the primigravida and multigravida pregnancies. Ethical considerations, including patient confidentiality, were strictly adhered to during data collection and analysis. Pregnant women with either eclampsia and/or pre-eclampsia, aged 18 years admitted to labor room during the study period were included in the study. Patients with protein losing enteropathy, uric acid disorders or renal disorders like nephrotic syndrome, Diabetes Mellites and liver diseases were excluded from the study. A woman who is pregnant for the first time was labelled as primigravida.9 Multigravida was defined as, a woman who has been pregnant two or more times irrespective of the pregnancy outcome.9 The Tonic-clonic generalized body convulsions after 20 weeks of gestation with no previous neurological disorders were called eclampsia.10 Patients having blood pressure of more than or equal to 140/90 with proteinuria of 300 mg/24 hours were labelled as preeclampsia.10 Reproductive age pregnancy was considered to be a teenage pregnancy (mother age group of 13-19 years), 20-35 years of age group was considered to be a reproductive age pregnancy, and that above 35 years was considered to be an advanced maternal age pregnancy.

The dataset obtained in the study was examined with the help of SPSS 23. Numerical variables, such as patient age, gestational age, blood pressure etc. were calculated using Mean 0 SD; quantitative variables, such as nature of gravidity, type of pregnancy, presence or absence of eclampsia or preeclampsia etc. were calculated using percentages and confidence intervals. The frequency rate of pre-eclampsia and eclampsia were calculated for both groups and compared using chi-square test to determine statistical significance. A p-value of less than 0.05 was considered statistically significant. Additionally, subgroup analysis was performed to explore the association between age and parity with the occurrence of these disorders. To clearly show the comparative trends, the results were displayed in tabular form. The use of patient data was approved ethically, guaranteeing data integrity and confidentiality throughout the analysis.

Results

The mean age of the 12498 patients admitted to the labor room of the Saidu group of Teaching Hospitals was 24 ± 2.4 years. Of the entire study population, 9484 (78.0%) were multigravidas and 3014 (21.9%) were primigravidas (Table 01). Over half of the patients with eclampsia and pre-eclampsia were between the ages of 20 and 35 (Table 02). Eclampsia or preeclampsia was diagnosed in 418 cases (3.3%) of primigravida and 1490 cases (11.9%) of multigravida. Eclampsia and pre-eclampsia were much more common in multigravida patients (12.8%) than in primigravida patients (3.3%), according to a comparative analysis, indicating a significant difference in the incidence of the disease between the two groups (Table 03).

Discussion

The results of this study show that in a tertiary care setting in Swat, Pakistan, multigravida women (11.9%) had a significantly higher prevalence of hypertensive disorders of pregnancy, specifically preeclampsia and eclampsia, than primigravida women (3.3%). This discrepancy highlights a major epidemiological change that calls for more investigation and calls into question the long-held clinical belief that primigravidity is the main risk factor for these conditions.

Table 1. Distribution of eclampsia and pre-eclampsia patients by parity

Gravidity	n (%)
Primigravida	418 (21.88%)
Multigravida	1041 (54.5%)
Grand multigravida	451 (23.6%)
Total	1910

Table 2. Age distribution among eclampsia/pre-eclampsia patients

Age	Number of patients (%)
13-19 years	483 (25.3%)
20-35 years	1129 (59.1%)
>35 years	298 (15.6%)
Total	1910

Traditionally, primigravida women have been considered at higher risk for preeclampsia due to first-pregnancy immunological maladaptation and inadequate placental vascular remodeling.[15-17] However, our data indicate that multigravida women, particularly those classified as grand multigravida (23.6% of the hypertensive disorder cases), carry a substantially elevated burden. This aligns with emerging global evidence that parity alone is an insufficient predictor of risk, especially in settings where advanced maternal age, comorbidities, and reproductive patterns are changing. In our cohort, 15.6% of preeclampsia/eclampsia cases occurred in women over 35, an age group predominantly composed of multigravida women. This suggests that ageing-related endothelial dysfunction, chronic hypertension, metabolic disorders, and accumulated obstetric injuries may collectively heighten susceptibility in multiparous women.[11,13,14]

Our prevalence rate of 11.9% among multigravida women is higher than rates reported in several similar low-resource settings. For instance, a Nigerian study by Obiechina et al, found a prevalence of 9.2% among multigravida women, while primigravida women had a rate of 6.5%.[12] Another study from India reported rates of 7.8% and 4.6% for multigravida and primigravida women, respectively.[10] The elevated prevalence in our study may reflect regional disparities in antenatal care quality, nutritional status, genetic predisposition, or higher rates of undiagnosed chronic conditions. A recent meta-analysis by Wahyunindita et al, highlighted that multigravida women in South Asia have 1.5 times higher odds of developing severe preeclampsia compared to primigravida women, partly due to higher rates of obesity and gestational diabetes in the region.[15]

In high-income countries, the trend is also shifting. According to a study by Fitrianingtyas et al., multiparous women who had previously experienced preeclampsia had a 40% higher chance of recurrence, and those who had new partners during subsequent pregnancies faced risks similar to those of primigravida women.[18] This validates our finding that immunological risks usually associated with first pregnancies may be reactivated by shifting paternity and extended intervals between pregnancies.

The increased incidence of eclampsia in multigravida women points to systemic deficiencies in prenatal care,

Table 3. Presence of eclampsia/pre-eclampsia in both groups

Total number of patients	Primigravida patients with eclampsia/ pre-eclampsia		Multigravida patients with eclampsia/ pre-eclampsia		P value
12498	Number	Percentage	Number	Percentage	0.02
	419	21.9%	1490	78.0%	

P = 0.02

J Postgrad Med Inst 2025;39(4):278-82.
http://doi.org/10.54079/jpmi.39.4.3637

which may result from patients' and healthcare professionals' complacency about multiparous women's perceived lower risk. Prenatal visits for multigravida women are fewer and less thorough in many low-resource settings, with less stringent urine screening and blood pressure monitoring.[19–21,16,9] Women who already have undiagnosed hypertension or renal disease are especially at risk from this. According to a BMJ study, multigravida women were 30% less likely than primigravida women to receive appropriate prenatal screening for hypertensive disorders, which resulted in a later diagnosis and terrible outcomes.[22]

Our results support universal risk assessment for all pregnant women, irrespective of obstetric history, through a parity-independent screening protocol. In particular, multigravida women should undergo routine screening for: Diabetes or chronic hypertension, a history of preeclampsia, Obesity (BMI ≥30), more than ten years between pregnancies, and paternity changes.[24,25]

According to WHO and ACOG guidelines, early initiation of low-dose aspirin (before 16 weeks) and calcium supplementation in high-risk multigravida women could significantly reduce the incidence.[1,26] The idea that "experienced mothers" are low-risk should also be debunked by community-based education initiatives that promote prompt prenatal visits and blood pressure self-monitoring.[23,17]

This study's strengths include real-world data from a representative tertiary hospital in a low-resource setting and a sizable sample size (12,498 admissions). But there are a few restrictions to be aware of. Our ability to evaluate lifestyle factors, medication adherence, and specific laboratory parameters (like uric acid levels, platelet counts, or liver enzymes) that could stratify disease severity was hampered by the retrospective design. Furthermore, we were unable to assess neonatal outcomes, which are essential for comprehending the entire disease burden. To better understand the pathophysiology and outcomes across parity groups, future prospective studies should include long-term follow-up, ultrasound findings, and serial biomarker measurements.

Conclusion

This study contributes to the mounting evidence that multigravida women in developing nations are significantly and potentially increasingly at risk for eclampsia and preeclampsia. Current prenatal care frameworks, which frequently give primigravida women priority, must be reevaluated in light of this change. Healthcare systems in resource-constrained settings can more successfully reduce the maternal and neonatal morbidity linked to hypertensive disorders of pregnancy by incorporating parity-independent risk assessment, improving provider training, and utilizing community health workers for early detection.

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Authors' Contribution Statement

PN contributed to the conception, design, acquisition, analysis, interpretation of data, drafting of the manuscript, critical review of the manuscript, and final approval of the version to be published. TI contributed to the acquisition, analysis, interpretation of data, and drafting of the manuscript. SP contributed to the acquisition, analysis, interpretation of data, and drafting of the manuscript. SA contributed to the acquisition, analysis, and interpretation of data. F contributed to the acquisition, analysis, and interpretation of data. UA contributed to the acquisition, analysis, and interpretation of data. All authors are accountable for their work and ensure the accuracy and integrity of the study.

Conflict of Interest

Authors declared no conflict on interest

Grant Suppport and Financial Disclosure

None

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.