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Maternal and Obstetrics Factors associated with Postpartum Eclampsia

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Abstract

This study examines neonatal and maternal outcomes in relation to blood pressure status and preeclampsia type. The analysis includes key neonatal factors such as ICU admission rates, mortality, and reasons for NICU referral. Among neonates, 18.3% were referred to the ICU, with 16.3% experiencing mortality. Physiological jaundice was the primary reason for NICU admission (77.8%), followed by aspiration (22.2%). Statistical comparisons based on maternal blood pressure and preeclampsia type showed no significant differences in NICU admission or neonatal mortality.

For maternal outcomes, 91.1% of patients were discharged alive, while 8.9% experienced mortality. Cerebrovascular accidents (CVA) accounted for 80% of maternal deaths, with 20% due to pulmonary embolism. Comparisons between normotensive and hypertensive mothers, as well as between antepartum and serious preeclampsia groups, indicated no statistically significant differences in survival outcomes.

These findings highlight the importance of continuous monitoring and improved management of neonatal and maternal health, particularly in cases involving hypertensive disorders and preeclampsia. Further studies are recommended to explore potential interventions that could reduce adverse outcomes.

Keywords: Antenatal, Neonatal, Postnatal, Postpartum Eclampsia, Pre-eclampsia

Introduction

This study provides a comprehensive overview of postpartum eclampsia, a severe obstetric complication that poses a significant risk to maternal and neonatal well-being.[1] Postpartum eclampsia is defined as the occurrence of seizures in women with preeclampsia following childbirth, typically within 48–72 h postpartum, although it can manifest up to four weeks after delivery in cases of late postpartum eclampsia.[2,3] The global impact of eclampsia is substantial, and the World Health Organization estimates that it accounts for 12% of all maternal deaths worldwide, translating to approximately 50,000 deaths annually. In India, the

incidence of eclampsia ranges from 0.179% to 3.7%, with maternal mortality rates among women with eclampsia ranging from 2.2% to 23%.[4]

Despite advancements in our understanding of the pathophysiology of preeclampsia, the precise factors contributing to postpartum eclampsia remain poorly understood. The study noted that while antepartum eclampsia has seen a reduction due to improved antenatal care and interventions such as magnesium sulphate administration[5], a comparable level of vigilance is often lacking in postpartum care. This gap in postpartum monitoring highlights the critical need for continuous surveillance of all postpartum patients regardless of their history of preeclampsia during pregnancy.

This thesis aims to address this knowledge gap by comprehensively investigating postpartum eclampsia within the context of the Gandhi Medical College in Bhopal, India. It seeks to assess the institutional burden of postpartum eclampsia, identify maternal and obstetric risk factors, and evaluate their impact on maternal and neonatal outcomes. By focusing on these objectives, this study aimed to contribute to the scientific understanding of postpartum eclampsia and provide valuable insights for healthcare practitioners and policymakers, particularly in the context of central India.

This study has immediate implications for clinical practice, potentially informing targeted preventive measures and enhancing management protocols for postpartum eclampsia. The significance of this study lies in its potential to bridge the gap between the current understanding and clinical practice, especially in regions where postpartum care may be less rigorous. By elucidating the risk factors and outcomes associated with postpartum eclampsia, this study could pave the way for more effective prevention strategies and improved patient care protocols, ultimately contributing to the reduction in maternal and neonatal morbidity and mortality related to this serious condition.

Methodology

Study Design: This study was observational in nature.

Study Site: Department of Obstetrics and Gynaecology at Gandhi Medical College, Bhopal.

Study Duration: The present study was conducted over 18 months.

Study Population: Women diagnosed with postpartum eclampsia, as per ACOG criteria, who received medical care and delivered in the Department of Obstetrics and Gynaecology at Gandhi Medical College, Bhopal.

Sample Size: All patients with postpartum eclampsia admitted during data collection phase in Department of Obstetrics and Gynaecology, GMC, Bhopal.

Inclusion and Exclusion Criteria: Women diagnosed with postpartum eclampsia, as defined by ACOG criteria, and willing to provide consent were included in the study.

Patients with pre-existing seizure disorders, seizures due to other medical conditions, or those unwilling to give consent were excluded.

Method of Data Collection

Permission from the institutional ethics committee and university clearance was obtained before initiating the study. Rapport was established with participants, who were provided with an information sheet and consent form, and the study details were explained in a language they understood. Informed written consent was obtained before data collection, which was conducted using a pre-structured and pre-tested proforma. A detailed history, thorough physical and obstetric examination, and relevant investigations were performed to identify risk factors. Information on age, parity, gravida, residence, and family history was recorded, along with antenatal and intra-natal details. Maternal and fetal monitoring

followed standard guidelines, and outcomes in terms of morbidity and mortality were documented. Prevalence was assessed by reviewing medical records from GMC Bhopal, documenting postpartum eclampsia cases during the study period. Maternal and obstetric risk factors were identified by analysing parameters such as maternal age, parity, pre-existing conditions, and prenatal care adequacy. The impact of postpartum eclampsia on maternal and neonatal outcomes was evaluated by comparing maternal morbidity, mortality, and neonatal health records between affected and unaffected groups.

Statistical Analysis

Data was collected and entered in SPSS version 23, coded appropriately, and analyzed in line with the study's objectives. Descriptive statistics, including frequencies and percentages, were used to summarize sample characteristics, while graphs and charts were generated. Analytical and inferential analyses were performed, with significance set at 0.05.

Results

This study analyzed 241 eclampsia cases, with 185 antepartum eclampsia and 56 postpartum eclampsia. The results and observations are illustrated in the following tables

Table 1: Distribution of patients according to Age Group

Age Group	Number	Percentage
< 20 years	4	7.10%
20 - 25 years	34	60.70%
26 - 30 years	15	26.80%
> 30 years	3	5.40%
Total	56	100.00%

The table shows the age distribution of patients. Most participants, 34 (60.7%), were aged 21-25 years, followed by 15 (26.8%) aged 26-30 years. Only 4 (7.10%) were under 20, and 3 (5.4%) were over 30. The mean age was 24.6 years, with ages ranging from 18 to 32 years.

Table 2: Distribution of patients according to Socio-economic Status

Socio-economic Status	Number	Percentage
Upper Class	3	5.40%
Upper Middle Class	7	12.50%
Middle Class	9	16.10%
Lower middle Class	21	37.50%
Lower Class	16	28.60%
Total	56	100.10%

In this study, 28.6% of participants were of lower socioeconomic status, 37.5% were of lower middle status, 16.1% were of middle status, 12.5% were of upper middle status, and 5.4% were of upper-class status according to the B.G. Prasad Modified Socioeconomic Status Scale.

Table 3: Distribution of patients according to parity

Parity	Number	Percentage
Primi Gravida	42	75.00%
G2	10	17.90%
G3 and above	4	7.10%
Total	56	100.00%

In this study, 75% of the participants were primigravida, 17.9% had Gravida 2 and 7.1% of the participants had Gravida 3 or above.

Table 4: Distribution of patients according to Referral Status

Referral Status	Number	Percentage
Referred	38	67.90%
Not Referred	18	32.10%
Total	56	100.00%

In this study, 67.9% of the participants were referred and 32.1% were not referred.

Table 5: Distribution of patients according to Maternal Outcome

Maternal Outcome	Number	Percentage
Alive and Discharged	51	91.1%
Dead	5	8.9%
Reasons for maternal mortality		
Reason	Number	Percentage
CVA	4	80%
Pulmonary embolism	1	20

In this study, 5 (8.9%) of the patients had sad demise and 51 (91.1 %) of the patients discharge alive and healthy. Of 5 maternal deaths 1 was because of pulmonary embolism and 4 deaths were because of CVA.

Table 6: Comparison of Maternal Outcome based on Blood Pressure Status

		Maternal Outcome				χ^2 Value	ρ Value
		Alive & Discharged		Dead			
		Count	N%	Count	N%		
Blood Pressure	Normotensive	10	100%	0	0.0%	1.194	0.275
	Hypertensive	41	89.1%	5	10.9%		
Total		51		5			

Table shows, among normotensive mothers, all the mothers were alive and discharged, with no deaths reported. Among hypertensive mothers, 89.1% were alive and discharged, while approximately 11% of the maternal deaths occurred in this group. The $\chi 2$ value was 1.194, with a p-value of 0.275, indicating no statistically significant difference between normotensive and hypertensive groups.

Table 7: Institutional Burden of Eclampsia

Types of Eclampsia	Frequency	Percentage
Total cases of eclampsia	241	-
Antepartum and Intrapartum eclampsia	185	76.6%
Post-partum eclampsia	56	23.2%

A total of 241 cases of eclampsia were recorded. Among these, 185 cases (76.6%) were identified as ante-partum eclampsia, which occurs before childbirth, typically during pregnancy. Post-partum eclampsia, which occurs after delivery, accounted for 56 cases, representing 23.2% of the total cases.

Table 8: Institutional mortality due to HTN disorders & Post-partum Eclampsia

Total mortality due to Antepartum Eclampsia & Intrapartum Eclampsia	Mortality due to post-partum eclampsia
12 / 185 (6.4%)	5 / 56 (8.92%)

The total mortality due to Antepartum Eclampsia was 12 cases, which corresponds to 6.4%% of the 185 total cases. However, the mortality rate for post-partum eclampsia was notably higher at 8.92%, with 5 deaths among the 56 cases reported. This higher mortality rate underscores the severity of post-partum eclampsia compared to other hypertensive disorders during pregnancy.

This study highlights the need for enhanced antenatal care, especially for high-risk groups, to prevent postpartum eclampsia and its complications. It also calls for focused education on recognizing early warning signs to reduce both maternal and neonatal morbidity and mortality.

Discussion

This study establishes strong connections between the present findings and prior research in the field of postpartum eclampsia. Here is an elaboration of the key points.

Incidence and Epidemiology

The study found that postpartum eclampsia accounted for 23.2% of all eclampsia cases (56 out of 241). This incidence falls within the range reported in previous studies but shows some variation. This is lower than the 38.4 % observed by Rath et al.[3] but higher than the 8.33% reported by Sarma et al.[6] The variation in incidence rates across studies underscores the need for region-specific research and highlights potential differences in healthcare practices, population characteristics, and detection methods. The relatively high incidence in this study emphasizes the importance of postpartum vigilance in eclampsia management, particularly in the central Indian context.

Demographic Characteristics

Most postpartum eclampsia cases (60.7%) occurred in women aged 20-25 years, with a mean age of 24.6 years. This aligns closely with the findings of several other studies, including those by Kanta Sarma et al.[6] and Mangal Supe et al.[7]. The consistency across studies in identifying younger women as a high-risk group emphasizes the need for targeted interventions and enhanced monitoring of this demographic. The predominance of cases in this age group could be attributed to various factors, including higher fertility rates and potentially lower awareness of pregnancy-related complications among younger women.

Parity and Risk

75% of the postpartum eclampsia cases in this study were primigravidas, which is consistent with findings from multiple studies. This high prevalence among first-time mothers underscores the importance of vigilant monitoring and education for primigravid women, both during pregnancy and in the postpartum period. Physiological and immunological changes unique to the first pregnancy may contribute to this increased risk. This finding suggests that prenatal education and care should be emphasized for first-time mothers.

Antenatal Care and access to healthcare

The study revealed that 75% of cases were unbooked, indicating a lack of proper antenatal care. This alarmingly high proportion is similar to findings from other studies, such as Madhu J et al. (86% unbooked).[8] The consistency of this finding across studies highlights a critical area for improvement in maternal healthcare, particularly in terms of access to and utilization of antenatal services. It also points to potential socioeconomic and educational factors that may be barriers to antenatal care. Addressing these barriers through community outreach, health education, and improved healthcare accessibility can significantly reduce the incidence of postpartum eclampsia.

Clinical Presentation

Headache was the most common prodromal symptom (37.5%), followed by vomiting (28.6%). This pattern is consistent with other studies, reinforcing the importance of recognizing these symptoms in postpartum care. The study also found that 64.3% of patients experienced only one episode of convulsion, with 44.6% occurring within 24 h of delivery. This emphasizes the critical window for postpartum monitoring and the need for healthcare providers to be vigilant during the immediate postpartum period. Patient education regarding these warning signs can lead to earlier recognition and treatment.

Maternal Outcomes

This study reported a maternal mortality rate of 8.92% for postpartum eclampsia, which is comparable to the rates reported in other studies, such as Bharathi et al.[1] (10.7%) and Berhan et al.[9] (11.4%). The primary causes of death were cerebrovascular accidents (4 cases) and pulmonary embolism (1 case), highlighting the severe complications associated with postpartum eclampsia and

the need for prompt, effective management. The slightly lower mortality rate observed in this study could be attributed to improved management protocols or better access to tertiary care. However, the rate remains alarmingly high, emphasizing the need for continued efforts to improve outcomes.

Overall, this study's findings largely corroborate existing research, while providing valuable insights specific to the central Indian context. The consistencies in demographic patterns, risk factors, and clinical presentations across studies reinforce the validity of these findings. However, the variations in incidence rates and outcomes underscore the need for context-specific research and interventions.

Future research could focus on developing and evaluating targeted interventions for these areas, as well as investigating the socioeconomic and cultural factors that contribute to the high rate of unbooked cases. Additionally, long-term follow-up studies could provide insight into the long-term consequences of postpartum eclampsia in both mothers and children.

Conclusion

In conclusion, this comprehensive study on postpartum eclampsia conducted at Gandhi Medical College, Bhopal, provides valuable insights into the prevalence, risk factors, and outcomes of this critical obstetric condition in Central India. This study revealed that postpartum eclampsia accounted for 23.2% of all eclampsia cases, highlighting the significant burden on maternal health in the region.

Several key findings have emerged from this study. First, the study identified young, primigravid women aged 20-25 years as a high-risk group for postpartum eclampsia, emphasizing the need for targeted interventions and enhanced monitoring of this demographic. Secondly, the alarmingly high proportion of unbooked cases (75%) underscores a critical gap in antenatal care utilization, pointing to the urgent need for improved access to and awareness of prenatal services.

The study also sheds light on the clinical presentation of postpartum eclampsia, with headache and vomiting being the most common prodromal symptoms, and a significant proportion of cases occurring within 24 hours of delivery. This information is crucial for improving early detection and management strategies. Furthermore, the research highlighted the severe maternal and neonatal outcomes associated with postpartum eclampsia, including a maternal mortality rate of 8.92% and high rates of adverse neonatal outcomes such as low birth weight and NICU admissions.

These findings largely corroborate existing research while providing context-specific insights for central India. This study underscores the multifaceted nature of postpartum eclampsia and the need for a comprehensive approach to its management, including improved antenatal care, vigilant postpartum monitoring, and targeted interventions in high-risk groups. The consistency of these findings with previous studies reinforces their validity and highlights the persistent challenges in managing this condition across different healthcare settings.

Moving forward, this study calls for concerted efforts to enhance maternal healthcare services, particularly in terms of antenatal care access and utilization, postpartum monitoring, and public health education. It also emphasizes the need for further research to develop and evaluate targeted interventions for high-risk groups and investigate the long-term consequences of postpartum eclampsia. By addressing these critical areas, there is the potential to significantly reduce the incidence and improve outcomes of postpartum eclampsia, thereby contributing to better maternal and neonatal health in the region and beyond.

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