

ORIGINAL RESEARCH

Factors associated with pregnancy-induced hypertension among women attending delivery service

¹Dr. Sukriti Shukla, ²Dr. Saurabh Shukla¹Assistant Professor, Department of Obstetrics and Gynaecology, Autonomous State Medical College, LakhimpurKheri, Uttar Pradesh, India²Assistant Professor, Department of Medicine, Autonomous State Medical College, LakhimpurKheri, Uttar Pradesh, India**Corresponding author**

Dr. Saurabh Shukla

Assistant Professor, Department of Medicine, Autonomous State Medical College, LakhimpurKheri, Uttar Pradesh, India

Email: drsaurabhshukla05@gmail.com

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ABSTRACT

Aim: The aim of this research was to evaluate pregnancy-induced hypertension and the factors associated with it in a sample of women who were attending delivery services. **Methods:** A cross-sectional study was conducted at a health facility, involving a total of 200 women who were recipients of delivery services. A method of systematic sampling was utilised to enrol study participants. A 95% confidence interval odds ratio was utilised. A P-value below 0.05 was deemed to indicate statistical significance. **Results:** The prevalence of pregnancy induced hypertension was 21 (10.5%). Gestational hypertension accounted for 26 (13%), mild preeclampsia for 35 (17.5%), severe preeclampsia for 52 (26%), and eclampsia for 3 (1.5%), of the total number of women who developed hypertension during pregnancy. **Conclusion:** Pregnancy-induced hypertension was observed to be 10.5% prevalent among women who sought delivery services. Predictive factors for pregnancy-induced hypertension included gestational age, a family history of the condition, and chronic renal disease.

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INTRODUCTION

Hypertension causes complications in 10% of pregnancies globally. Pre-eclampsia and eclampsia are the leading causes of morbidity and mortality among pregnant women and infants.¹ Pregnancy-induced hypertension (PIH), which falls under the category of hypertensive disorders of pregnancy, is estimated to impact an additional 5–8% of expectant women globally. The term "pregnancy induced hypertension" (PIH) refers to blood pressure readings of 140/90 mmHg or greater after two periods of rest or 160/110 mmHg, respectively, in a woman who was previously considered normotensive.² A comprehensive categorization of hypertension induced during pregnancy includes gestational hypertension, pre-eclampsia, and eclampsia.³ In pregnancy, severe preeclampsia is defined as systolic or diastolic blood pressure of 160 mmHg or higher, or both. Eclampsia, a severe form of pregnancy-induced hypertension, manifests towards the late stages of pregnancy and affects approximately one in every 1,600 pregnancies.⁴ Pregnancy-induced

hypertension is distinguished by three principal symptoms: elevated blood pressure, proteinuria, and pathological edema.⁵

Hypertension induced during pregnancy is a significant cause of morbidity and mortality among mothers and perinatals. Severe hypertension raises the likelihood of cerebral vascular accidents, cardiac failure, heart attack and renal failure in the mother. Furthermore, complications such as inadequate placental oxygen transmission, growth restriction, preterm birth, placental abruption, stillbirth, and neonatal mortality increase the fetus's vulnerability. Hypertensive disorders are the most prevalent medical complications that may arise during pregnancy, accounting for an incidence ranging from 5% to 10%.⁶ Preeclampsia leads to maternal and neonatal morbidity and mortality on a global scale, with developing nations bearing the brunt of this burden. In late pregnancy, the disorder is typically identified through the observation of elevated blood pressure accompanied by proteinuria and/or edema. The following risk factors are associated with PIH:

negative parity, multiple pregnancies, a history of chronic hypertension, gestational diabetes, fetal malformation, obesity, extreme maternal age (less than 20 years or over 40 years), a history of PIH in previous pregnancies and unrecognised chronic hypertension; a positive family history of PIH indicates genetic susceptibility; psychological stress; alcohol use; rheumatic arthritis; extreme underweight and obesity and extreme maternal age (less than 20 years or over 40 years).⁷

Despite the Federal Ministry of Health's implementation of multifaceted strategies to reduce maternal and newborn morbidity and mortality, such as strengthening facility-based maternal and newborn services and improving access to such services, there has been a noticeable upward trend in maternal morbidity and mortality attributed to pregnancy-induced hypertension.⁸

Although pregnancy-induced hypertension is a prominent contributor to maternal morbidity and mortality, there is limited understanding regarding the current prevalence of PIH and the factors associated with it among women who are utilising delivery services. As a result, the current investigation was undertaken to evaluate pregnancy-induced hypertension and its correlated variables among women who were using delivery services.

MATERIALS AND METHODS

This health facility-based cross-sectional study was conducted. All women who attended a delivery service comprised the study population. A sample of 200 women who were present at the delivery service was chosen for the research.

Inclusion criteria

All women who were admitted to the delivery ward and had a gestational age exceeding 28 weeks were enrolled in the research.

Exclusion criteria

Females diagnosed with chronic hypertension and those who, despite completing their treatment, were

rendered incapable of communicating due to critical illness were ineligible to participate in the study.

Pregnancy induced hypertension (PIH)

Trained data collectors assessed the blood pressure of a 28-week-gestation woman presenting to the delivery service with hypertension (140/90mmHg) on two separate occasions, six hours each time. The measurements were conducted with or without the presence of proteinuria. The PIH diagnosis was validated by a physician employed in the labour ward. Pregnant-induced hypertension comprises pre-eclampsia, eclampsia, and gestational hypertension.

Psychological stress

A woman was deemed to be psychologically stressed if her result exceeded the mean.

Data collection procedure

The data were gathered via in-person interviews, measurements, and a review of the mother's medical records using a structured questionnaire that had been pretested by trained data collectors. Night and day were devoted to data collection so as not to overlook any cases. A mercury sphygmomanometer was utilised to obtain blood pressure readings from the woman while she was situated in both the upright and supine positions. In the case of women who were referred, the blood pressure and protein urea levels were obtained from the referral form at the time of diagnosis.

Statistical analysis

For data entry and analysis, Statistical Package for the Social Sciences (SPSS) software version 21.0 and EPI data statistical software version 3.1 were utilised. By utilising odds ratios accompanied by 95% confidence intervals, associations between dependent and independent variables were investigated. Significance was attributed to a P-value below 0.05. The final presentation of the results comprised of tables and narrative formats.

RESULTS

Table 1: Distribution of the study participants by their socio- demographic characteristics

Variables		Frequency (n=200)	Percentage %
Age of women	<20	27	13.5
	20-24	75	37.5
	25-29	63	31.5
	30-34	20	10
	>35	15	7.5
Address of women	Rural	105	52.5
	Urban	95	47.5
Marital status	Married	188	94
	Single	7	3.5
	Divorced	3	1.5
	Widowed	2	1
Occupational status	Housewife	140	70
	Government job	31	15.5

	NGO	23	11.5
	self	6	3
Family size	1-2	37	18.5
	3-4	110	55
	≥5	53	26.5

75 (37.5%) of the total study participants were between the ages of 20 and 24, while 188 (94%), were married. 52.5 percent of the participants, or 105 individuals, were from rural areas. The majority of the participants, 140 (70%) were housewives, and 110 (55%) belonged to families with three to four children.

The prevalence of hypertension induced during pregnancy was 21 (10.5%) among women who presented at the delivery service. The range of systolic

blood pressure measurements was 90 mmHg to 210 mmHg, with a mean value of 109.57 ± 15.315 . The range of diastolic blood pressure measurements was 76.42 ± 13.093 , with a range of 50 mmHg to 160 mmHg. Gestational hypertension accounted for 26 (13%), mild preeclampsia for 35 (17.5%), severe preeclampsia for 52 (26%), and eclampsia for 3 (1.5%), of the total number of women who developed hypertension during pregnancy.

Table 2: Frequency distribution of variables related to obstetric conditions

Variables		Frequency (n=200)	Percentage%
Pregnancy status	Wanted	194	97
	Unwanted	6	2
Gravida	Primigravida	86	43
	Multigravida	114	57
Parity	0	61	30.5
	1-4	124	62
	≥5	15	7.5
Gestational age	<37	48	24
	37-42	149	74.5
	>42	3	1.5
History of previous PIH(n=187)	Yes	14	7.4
	No	173	92.5
Multiple pregnancy	Yes	24	12
	No	176	88
History of previous GDM(n=185)	Yes	4	2.1
	No	181	97.8

194 (97%) of the pregnancies among the expectant women who took part in the study were desired pregnancies, while 114 (57%) were multigravida. In terms of the parity of the women, 149 (74.5%) were between 37 and 42 weeks of gestation, while 124 (62%), had parity between 1 and 4. A mere 14 (7.4%) of the expectant mothers admitted for delivery exhibited a prior diagnosis of PIH, and a mere 4 (2.1%) had a history of gestational diabetic mellitus; multiple pregnancies constituted 24 (12%) of the cases.

Table 3: Distributions of medical and family history risk factors among delivered women

Variables		Frequency (n=200)	Percentage %
Family history of chronic hypertension	Yes	24	12
	No	176	88
Family history of PIH	Yes	9	4.5
	No	191	95.5
History of diabetic mellitus(DM)	Yes	6	3
	No	194	97
Family history of DM	Yes	17	8.5
	No	183	91.5
History of kidney diseases	Yes	15	7.5
	No	185	92.5
Currently history of asthma.	Yes	10	5
	No	190	95

In relation to medical and familial medical backgrounds, it was found that among the entire sample, 24 individuals (12 percent) had a familial

predisposition to chronic hypertension, while 9 individuals (4.5 percent) had a family history of pregnancy-induced hypertension, which was

frequently inherited from their mothers. In relation to renal diseases, a mere six respondents (3%), or fifteen percent, reported having a history of chronic diabetic mellitus during the current pregnancy, while fifteen (7.5%) had a history of kidney diseases. A mere 17 (8.5%) of the study participants reported a familial predisposition to diabetes mellitus, while 10 (5% of the sample) had a history of asthma.

The following factors were identified through multivariable logistic regression as contributors to pregnancy-induced hypertension: Pregnancy-induced hypertension was found to be significantly associated with gestational age, a positive family history of kidney diseases during pregnancy, asthma and pregnancy-induced hypertension. Compared to expectant women who did not have a family history of pregnancy-induced hypertension, those who had a history of such hypertension were five times more likely to develop the condition while utilising delivery services.

Predictive significance was attributed to gestational age in this study; women whose gestational age was 37 weeks or longer had a decreased likelihood of developing pregnancy-induced hypertension.

DISCUSSION

In this study, pregnancy-induced hypertension was observed to be prevalent among 21 (10.5%) of the women who sought delivery services. This could potentially result in elevated rates of morbidity and mortality among both the mother and the foetus. Long-term, failure to implement adequate preventive measures for expectant women may result in this hazard becoming the leading cause of maternal mortality. The incidence of PIH in this research is comparable to that of Sajith M et al⁹ study, which recorded 9.8%. Nevertheless, this value is marginally lower in comparison to the results reported by Khosravi S et al¹⁰ (9.8%), Wolde Z et al¹¹ (8.48%) and Tessema GA et al¹² (8.4%). Potentially attributable to variations in study period and study design are these disparities. The population may also exhibit variations in terms of culture and way of life. Nevertheless, the prevalence observed in this research was higher than that of Teklu S et al¹³, who determined it to be 5.3%.

Variations in the research period, study design and health-seeking behaviours of pregnant women may account for this disparity. Furthermore, the discrepancy could potentially be attributed to the prevailing health policy that prioritises the execution of targeted antenatal care (ANC) and exempts maternal care services, thereby encouraging expectant women to seek medical attention and deliver at health facilities, thereby increasing the likelihood of case detection.

Several factors associated with pregnancy-induced hypertension were also identified in this study. Individuals with a familial predisposition to pregnancy-induced hypertension were approximately

five times more likely to develop the condition themselves. This finding aligns with the research conducted by Van Middendorp et al¹⁴. This phenomenon could potentially be attributed to genetic predisposition factors that are associated with pregnancy-induced hypertension.

The presence of kidney disease during pregnancy is associated with an increased risk of developing pregnancy-induced hypertension, according to this study. This result was comparable to that of Ayele G et al¹⁵, whose research demonstrated statistically significant correlations between preexisting renal diseases and pregnancy-induced hypertension.

Additionally, this research demonstrated that pregnant women with asthma have a greater likelihood of developing pregnancy-induced hypertension compared to those without asthma. This finding is consistent with the research conducted by Lehrer S et al¹⁶ and Martel MJ et al¹⁷. Gestational age was another factor that was found to be associated with PIH in this research. Specifically, women who were 37 weeks or older at the time of conception had a reduced likelihood of developing pregnancy-induced hypertension compared to those who were younger than 37 weeks gestation. This, however, contradicts the findings of the literature. This could be attributed to the fact that the participants of this research were women seeking delivery services, thereby limiting the number of women with PIH who delivered prior to or around 37 weeks of gestation in order to mitigate the likelihood of adverse maternal and fetal outcomes.

Potential limitations could stem from the preparedness and capability of the women to accurately disclose all pertinent information regarding themselves and their families, which formed the basis of the PIH. Furthermore, the self-referred nature of the pregnant women may have introduced recall and social desirability biases during the data collection process. However, efforts have been made to mitigate these constraints through the implementation of targeted inquiries.

CONCLUSION

10.5% of women who attended delivery facilities were diagnosed with pregnancy-induced hypertension; this finding suggests that a considerable proportion of this population was affected by this condition. The most prevalent form of hypertension induced during pregnancy was severe preeclampsia. Pregnancy-induced hypertension was found to be associated with chronic renal diseases (kidney diseases), a family history of the condition, and gestational age..

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