Prevalence and outcomes of pregnancy-induced hypertension among women seeking maternity services in selected tertiary hospitals of Gandaki Province

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ABSTRACT

Introduction: Pregnancy-induced hypertension (PIH), particularly pre-eclampsia and eclampsia, significantly contributes to maternal and perinatal mortality globally. This study aimed to assess the prevalence and outcomes of PIH among women seeking maternity services in tertiary hospitals in Gandaki Province. **Methods:** A retrospective research design was adopted, using a census method. The secondary data of women seeking maternity services in selected tertiary hospitals of Gandaki Province between Shrawan 2079 to Ashad 2080 was included in the study. Medical records and logbooks were reviewed, focusing on 751 women diagnosed with PIH. Data were analyzed using descriptive statistics. **Results:** Out of 11,927 women, 751 women seeking maternity services in Gandaki province had PIH. More than half (53.4%) had gestational hypertension, 35% had pre-eclampsia, 6.5% had eclampsia, and 5.1% had chronic hypertension with superimposed pre-eclampsia. Regarding maternal outcomes, 11.5% had pre-labour rupture of membrane, 1.3% had postpartum hemorrhage, 0.9% had abruptio placenta, and 0.3% had acute respiratory distress syndrome. Likewise, 18.5% had fetal distress, 13.6% had oligohydramnios, 8% had intrauterine growth retardation and 3.1% was intrauterine fetal death or stillbirth. Twenty-five percent had prematurity, 31.4% had low birth weight, and 19.6% were admitted to the newborn intensive care unit. In the study, 0.1% of maternal deaths and 1.6% of neonatal deaths were found in women with PIH. **Conclusions:** The prevalence of PIH was nearly one-tenth among women seeking maternity services, affecting both maternal and fetal outcomes. Gestational hypertension was the most common type. Implementing awareness programs focused on early diagnosis and treatment of PIH is recommended for better outcomes.

Keywords: Maternity, outcomes, pregnancy-induced hypertension, prevalence, tertiary hospital.

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INTRODUCTION

Each year, about 287,000 mothers die globally due to pregnancy complications.[1] Hypertensive disorders during pregnancy are a major cause of maternal illness and death.[2] Hypertension during pregnancy accounts for 14% of these maternal deaths.[3] It is the second leading cause of maternal mortality, affecting 6-10% of pregnancies worldwide.[4] In the United States, around 7.4% of annual pregnancy-related deaths are caused by hypertension-related disorders.[5] Hypertensive disorders of pregnancy account for 19% of maternal deaths in Ethiopia.[6] A study in India found that 10.4% of pregnant women had high blood pressure disorders.[7] Pre-eclampsia and eclampsia are more common in developing countries.[8]

Pregnancy-induced Hypertension (PIH) is categorized into four types: pre-eclampsia, eclampsia, chronic hypertension with superimposed preeclampsia, and gestational hypertension.[9] The most common

types were preeclampsia, gestational hypertension, and eclampsia.[10-11] Studies show that hypertensive disorders during pregnancy increase the risk of maternal death, preterm birth, stillbirth, low birth weight, intrauterine growth restriction, neonatal death, and may require an emergency cesarean section.[12-14] A study conducted in Nigeria found that the prevalence of pre-eclampsia and eclampsia was low, but there were high rates of perinatal deaths and complications for both mother and baby.[15]

In the context of Nepal, 12% of maternal deaths are attributed solely to hypertensive disorders.[16] A study conducted in Nepal found that 6.43% of pregnant women developed PIH.[11] The prevalence of pre-eclampsia and eclampsia in Nepal was 2.6% and 0.5%. Younger women and women with poor antenatal checkups had an increased risk of PIH.[17] Identifying risk factors can help in early diagnosis and ensure that high-risk patients receive appropriate care and monitoring.[18] Very limited studies have been documented in the context of Nepal. Therefore, the researcher aimed to assess the prevalence and outcomes of PIH among women seeking maternity services in tertiary hospitals of Gandaki Province.

METHODS

A retrospective study design was conducted among women seeking maternity services at Pokhara Academy of Health Sciences (PoAHS), Manipal Teaching Hospital (MTH), and Gandaki Medical College Teaching Hospital and Research Centre (GMCTHRC). It included all primiparous and multiparous women who gave birth, either vaginally or by cesarean section, at these hospitals from Shrawan 1, 2079 to Ashad 31, 2080 during the fiscal year 2079/080. Researchers reviewed medical records, registers, and logbooks. Women with chronic hypertension, kidney disease, heart disease, diabetes, or incomplete data were excluded from the study. A census method was adopted. Data were collected using a pre-tested checklist questionnaires, which consisted of three parts. The first part included questions about sociodemographic characteristics, the second part contained questions related to obstetric characteristics, and the third part included a checklist regarding pregnancy-induced hypertension and its outcomes. The pretest was conducted at Pokhara Academy of Health Sciences using data from Baishakh, Jestha, and Ashad 2079, and necessary modifications were made. Content validity was ensured through an extensive literature review and consultation with experts.

In this study, PIH refers to gestational hypertension, preeclampsia, eclampsia, and chronic hypertension with superimposed preeclampsia. Medical records and logbooks were reviewed, and diagnoses made by obstetrics/gynecology specialists were used to confirm cases of PIH. Maternal outcomes include complications such as placental abruption, preterm labor, postpartum hemorrhage, acute respiratory distress syndrome (ARDS), admission to the intensive care unit (ICU), and maternal death. Fetal and neonatal outcomes include complications such as oligohydramnios, intrauterine growth restriction (IUGR), stillbirth, fetal distress, birth asphyxia, admission to the Neonatal Intensive Care Unit, low birth weight, and neonatal death.

Data were collected after receiving ethical approval from the Ethical Review Board (ERB) of Tribhuvan University (Ref. No. ERBTU-080-026). Administrative approval was obtained from the Institutional Review Committees of POAHS, MTH, and GMCTHRC. The concerned authorities, including the head of the department and the ward in-charge of the Maternity ward, were briefed about the study's objectives, process, and importance. Secondary data were collected over three months with the assistance of the ward in charge, staff, and medical record personnel. Ethical norms were maintained throughout the study. All information collected from record books, patient charts, and logbooks was kept confidential and used only for research purposes. During data processing, code numbers were used instead of participants' names to ensure confidentiality. The collected data were edited, organized, coded, and entered into Statistical Package for the Social Sciences (SPSS) version 16.0 for analysis. Data were analyzed using descriptive statistics such as frequency, percentage, mean, and standard deviation.

RESULTS

In this study, 11,927 women had sought maternity services from three selected tertiary hospitals in Gandaki Province during the fiscal year 2079/080. Among these women, 751 were diagnosed with PIH.

Out of the 751 women diagnosed with PIH, the majority (77.9%) were aged between 20 and 34 years. The mean age was 27.86 ± 5.73 years. Twelve percent of the women had comorbidities, and 2.8% had a history of PIH. Almost all (98.8%) of the women had singleton pregnancies, and 52.7% were multigravida. Among them, 38.6% were at full term, while 43.0% were not in labor despite induction. Regarding delivery, 69.9% of the women had their pregnancies terminated through cesarean section, with 94% of these being emergency lower-segment cesarean

sections. Additionally, 22.8% of the women who underwent cesarean sections had a previous history of cesarean delivery.

Table 1: PIH among women seeking maternity services (N=11,927)

PIH	Number (n)	Percentage (%)
Prevalence of PIH	751	6.2
Types of PIH (n=751)		
Gestational hypertension	401	53.4
Preeclampsia	263	35
Eclampsia	49	6.5
Chronic hypertension with superimposed preeclampsia	38	5.1

Out of 11927 women, 751 had PIH. Among them, 401(53.4%) had gestational hypertension, 263(35%) had pre-eclampsia, 49(6.5%) had eclampsia, and 38(5.1%) had chronic hypertension with superimposed pre-eclampsia. (Table 1)

Table 2: Maternal outcomes of women with PIH (N=751)

Maternal Outcomes	Pregnancy-Induced Hypertension				
	Gestational Hypertension (n=401)	Pre-eclampsia (n=263)	Eclampsia (n=49)	Superimposed preeclampsia (n=38)	Total
	n(%)	n(%)	n(%)	n(%)	n(%)
Pre-labour rupture of the membrane	42(10.5%)	35(13.3%)	7(14.3%)	2(5.3%)	8 (11.5%)
Abruptio placenta	2(0.5%)	5(1.9%)	0	0	7 (0.9%)
Postpartum hemorrhage	4(1.0%)	4(1.5%)	2(4.1%)	0	10 (1.3%)
Acute respiratory distress syndrome	0	1(0.4%)	1(2.0%)	0	2(0.3%)
Admission to ICU	0	4(1.5%)	0	0	4(0.5%)
Hospital Stay					
< 5 days	323(80.5%)	165 (62.7%)	15 (30.6%)	26 (68.4%)	529 (70.4%)
≥ 5 days	78(19.5%)	98 (37.3%)	34 (69.4%)	12(31.6%)	222 (29.6%)
Maternal Death	0	1(0.4%)	0	0	1(0.1%)

Among women with PIH, 11.5% had pre-labour rupture of membrane, 1.3% had postpartum hemorrhage, 0.9% had abruptio placenta, 0.3% had acute respiratory distress syndrome, and 0.5% of them were admitted to the ICU. The majority of the women (70.4%) were admitted for less than 5 days in hospital. Likewise, 0.1% of women died due to pregnancy-induced hypertension. (Table 2)

Table 3: Fetal outcomes of women with PIH (N=751)

Fetal Outcomes	Pregnancy Induced Hypertension				
	Gestational Hypertension (n=401)	Pre-eclampsia (n=263)	Eclampsia (n=49)	Superimposed preeclampsia (n=38)	Total
	n(%)	n(%)	n(%)	n(%)	n(%)
Before birth					
Oligohydramnios	40(10.0%)	52(19.8%)	7(14.3%)	3(7.9%)	102 (13.6%)
Fetal distress	83(20.7%)	41(15.6%)	9(18.4%)	6(15.8%)	139 (18.5%)
IUGR	17(4.2%)	33(12.5%)	5(10.2%)	5 (13.2%)	60 (8%)
IUFD/ Stillbirth	7(1.7%)	10(3.8%)	6(12.2%)	1(2.6%)	24 (3.1%)
After birth (n=737)					
APGAR score at 1 minute					
<7	166(41.7)	110(43.5%)	30(68.2%)	20(54%)	331 (45%)
≥7	232(58.3)	143(56.5%)	14(31.8%)	17(46%)	406 (55%)
APGAR score at 5 minutes					
<7	23(5.8)	40(15.5%)	18(41%)	6(16.2%)	87 (11.8%)
≥7	375(94.2)	218(84.5%)	26(59%)	31(83.8%)	650 (88.2%)
Prematurity	64(16.0)	91(34.6%)	25(51%)	8(21.1%)	188 (25%)
Birth weight (n=761)					
Normal birth weight	318(78.5)	147(54.6%)	14(28.5%)	25(65.8%)	504 (66.2%)
Low birth weight	78(19.2)	115(42.7%)	35(71.4%)	11(28.9%)	239 (31.4%)
Macrosomia	9(2.3)	7(2.7%)	0	2(5.3%)	18 (2.4%)
Admission to NICU	45(11.2)	69(26.2%)	24(49%)	9(23.7%)	147 (19.6%)
Neonatal Death	5(1.2)	2(0.8%)	5(10.2%)	0	12 (1.6%)

Fetal outcomes showed that 18.5% of the fetuses had fetal distress, 13.6% had oligohydramnios, and 8% had IUGR. Among the fetuses, 3.1% were IUFD/stillbirth. In terms of APGAR scores, 55.0% and 88.2% of the babies had APGAR scores of 7 or more at 1 minute and 5 minutes, respectively. Furthermore, 25% of the babies were born prematurely, 31.4% had low birth weight, 19.6% required admission to the NICU, and 1.6% resulted in neonatal death. (Table 3)

DISCUSSION

Women with PIH are at higher risk of adverse pregnancy outcomes than those without. Inadequate knowledge and resources are a threat to the proper management of PIH. In the present study, the prevalence of PIH was observed among 6.2% of the women seeking maternity services, whereas studies conducted in Zimbabwe showed 19.6% and Pakistan showed 13.6%.[19,20] The finding of the present study was

similar to the prevalent study conducted in Nepal which showed 6.4% prevalent rate of PIH.[11] Similarly, another study done by Ain et al.[21] in Pakistan also found 6.5%. Likewise, study conducted in India showed 10.4% of PIH among women who visited the obstetrics and gynecology department.[7]

In the current study, 53.4% of the women seeking maternity services had gestational hypertension. The finding was lower than the previous study conducted in Nepal which observed 78.1%.[11] This study found 35% of the women had pre-eclampsia and 6.5% had eclampsia whereas systematic review conducted in Nepal noted 2.6% pre-eclampsia and 0.5% eclampsia.[17] In the present study 5.1% had chronic hypertension with superimposed pre-eclampsia. The finding of the present study was supported by the previous study conducted in India which was 47.4% had gestational hypertension, 32.6% had pre-eclampsia, 8.2% had eclampsia and 11.8% had chronic hypertension with superimposed pre-eclampsia.[7]

In this study, 69.9% of the women had terminated their pregnancy through cesarean section. The finding of the current study was similar to the previous study conducted in Nepal which was 71.2%.[22] This study was supported by another study conducted by Shrestha et al.[17] in Nepal. In the current study, 1.3% of women with PIH had postpartum hemorrhage and 0.9% had abruptio placenta, whereas a study conducted in India showed 2.9% had postpartum hemorrhage and 5% had abruptio placenta.[7]

In this study, 13.6% of mothers with PIH had oligohydramnios, 25% had prematurity, 8% had IUGR, and 3.1% of fetuses were IUFD/stillbirth, whereas studies conducted in Nepal showed 6.5% had oligohydramnios, 26% had prematurity, 38.5% of fetuses had IUGR, and 2.2% were IUFD.[11,17] Similarly, in this study, 55.0% and 88.2% of the newborns had Apgar scores of 7 or more at 1 minute and 5 minutes, respectively. The finding of the current study was supported by a previous study conducted by Muti et al.[19] In the current study, 8% of the fetuses had intrauterine growth retardation (IUGR) and 19.6% of the newborn had low birth weight whereas a study conducted in Western Nepal showed 30% and 48% respectively.[22]

CONCLUSIONS

The prevalence of PIH was nearly one-tenth among women seeking maternity services in Gandaki Province. Complications such as pre-labor rupture of membranes, postpartum hemorrhage, abruptio placenta, acute respiratory distress syndrome, and maternal death were observed among women with PIH. Fetal outcomes included fetal distress, oligohydramnios, IUGR, prematurity, IUFD or stillbirth, low Apgar scores, low birth weight, and neonatal death. Improved awareness and early diagnosis of PIH are recommended for better outcomes.

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CONFLICTS OF INTEREST: None declared

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AUTHORS' CONTRIBUTIONS

RT, BG, and RA reviewed the literature and conceptualized the study. RT and BG carried out data collection. RT and RA were responsible for data analysis, interpretation, and preparation of results. RT and BG drafted the manuscript, which was reviewed and approved by all authors. All authors agreed to be accountable for all aspects of the research work.

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