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Maternal and Perinatal Outcome in Patients with Gestational Hypertension: An Observational Study

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ABSTRACT

The prevalence of gestational hypertension remains widespread on a global scale and is linked to elevated rates of perinatal and maternal morbidity and mortality. This study examines patients who were admitted to the Department of Obstetrics and Gynaecology with gestational hypertension. The study was conducted over a period of 18 months. The aim of the study was to prevalence of gestational hypertension, mild and severe pre-eclampsia and eclampsia and their impact on maternal outcomes like mode of delivery and associated complications. The study also investigated the perinatal outcome in relation to neonatal complications. In this study, an analysis of the frequency and percentage of socio-demographic variables, risk factors and symptomatology was also done. During the study period, a total of 200 cases of gestational hypertension were included for analysis. Mild pre-eclampsia was the most frequently observed presentation of gestational hypertension, followed by severe pre-eclampsia, gestational hypertension and antepartum eclampsia. Only one case of chronic hypertension was identified. 37.6% of the participants included in the study experienced maternal morbidity and mortality, the values being 3.6%. The prevalent complications observed in the study were abruption, wound infection and eclampsia, which constituted 11, 9 and 7.7% of the total cases, respectively. The perinatal outcome revealed that the majority of cases, accounting for 48.2%, were shifted to the mother's side, while 41.6% were transferred to the Special Newborn Care Unit (SNCU). A smaller proportion of cases, 7.9%, were classified as intrauterine fetal demise (IUFD) and the least frequent outcome, at 2.1%, was stillbirth. Despite a increase rate of identification of pre-eclampsia and eclampsia, these conditions continue to significantly impact maternal and fetal health outcomes. Frequent antenatal examinations, timely identification of medical conditions, expeditious interdisciplinary intervention and appropriate timing of delivery are effective measures in decreasing the occurrence of complications and maternal and perinatal mortality. Timely referral and effective management of such cases at healthcare facilities equipped with advanced resources can significantly decrease maternal and perinatal mortality rates.

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Key Words
Gestational hypertension, pre-eclampsia, eclampsia

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INTRODUCTION

Gestational hypertension is a prevalent and significant medical issue. As per the revised statement of 2014 from the International Society for the study of Hypertension in pregnancy (ISSHP), hypertension that arises after 20 weeks of gestation and exhibits systolic blood pressure of ≥140 mmHg and/or diastolic blood pressure of ≥90 mmHg should be considered as Gestational hypertension (GH). It is imperative to record baseline blood pressure levels prior to conception or during the initial trimester of pregnancy. In cases where the earlier status of pregnancies is unknown, those that exhibit hypertension after 20 weeks of gestation should be regarded as instances of pregnancy-induced hypertension (PIH) and treated accordingly[1]. Hypertensive disorders complicate approximately 5-10% of pregnancies on a global scale[2]. The National Eclampsia Registry has reported that the incidence of hypertensive disorders in India is 10.08%. The prevalence of eclampsia among registered patients is 1.9% according to the cited source[3]. The occurrence of hypertensive disorders during pregnancy, including preeclampsia and eclampsia, has been observed to be increasing worldwide, as per a multi-country survey conducted by Abalos *et al*.[4]. This condition plays a substantial role in the incidence of morbidity and mortality among both mothers and fetuses. While it may not be possible to prevent the condition, timely identification and effective intervention can significantly mitigate the associated complications. The possibility of achieving better maternal and fetal health outcomes is facilitated by advancements in prenatal care across all tiers and the implementation of suitable and prompt interventions. The aforementioned statistics indicate a notable reduction in the incidence of maternal and fetal morbidity rates and associated complications in developed nations. This outcome can be attributed to superior prenatal healthcare. The objectives of this observational study conducted in a hospital setting are to ascertain the extent of the problem and quantify the resultant adverse outcomes for both the fetus and mother.

MATERIALS AND METHODS

The present investigation is a prospective observational study conducted within the department of Obstetrics and Gynaecology for a duration of 18 months subsequent to obtaining approval from the Institutional ethical committee. The diagnosis of pregnancy-induced hypertension (PIH) was established based on the measurement of systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg on two separate occasions, with a time interval of 4-6 hrs, after the 20th week of gestation. This diagnostic criterion encompasses all instances of mild and severe preeclampsia and eclampsia. The diagnosis of severe preeclampsia was established based on the criteria of systolic blood pressure ≥160 mmHg and diastolic blood pressure ≥110 mmHg. In the case of HELLP syndrome, the diagnosis was made when there was evidence of Haemolysis, deranged liver function, indicated by transaminase levels twice the normal limit, LDH levels twice the upper normal limit, or levels exceeding 650 IU L^{-1} and low platelets. The investigations and management procedures were conducted in accordance with the Standard Operating Procedures (SOP). All cases underwent blood investigations, including haemoglobin estimation, platelet count, liver function tests and renal function tests. The coagulation profile, consisting of prothrombin time (PT), activated partial thromboplastin time (aPTT) and international normalized ratio (INR), was assessed in patients with suspected clinical presentations of abruption, HELLP syndrome and Disseminated Intravascular Coagulation (DIC). The dipstick method was utilized to estimate urine protein levels. In instances where a determination was made to prolong a pregnancy for a certain duration, obstetric ultrasound with doppler velocimetry was conducted. Admission in all instances, Cardiotocography (CTG) was conducted. Intravenous labetolol or oral labetolol/nifedipine were administered as the preferred treatment for cases of severe hypertension. Patients with hypertension exhibiting a diastolic blood pressure equal to or greater than 100 mmHg were administered oral labetolol/nifedipine to achieve normotensive blood pressure levels. Magnesium sulphate was administered to manage all instances of eclampsia, impending eclampsia (characterized by symptoms such as severe headache, visual scotomata, nausea, vomiting, oliguria and epigastric pain) and severe hypertension, following Pritchard's protocol. In cases where imminent delivery was not indicated, Betamethasone was administered at a dosage of 12 mg, with a 24 hrs interval, to all pregnancies that are less than 37 weeks. Deliveries were scheduled for all cases that exceeded 37 weeks of gestation. Conservative management was provided for preterm pregnancies, with the aforementioned investigations being conducted twice a week. However, this approach was not applicable in cases of eclampsia, imminent eclampsia, uncontrolled maternal hypertension despite anti-hypertensives, HELLP syndrome, placental abruption, absent or reverse end diastolic flow in Doppler velocimetry and non-reassuring CTG. The individuals who were undergoing conservative management underwent blood pressure monitoring every 4 hrs. The present study investigated maternal complications, including HELLP syndrome, abruptio placentae, Post Partum Haemorrhage (PPH),

neurological complications, Intensive Care Unit (ICU) admissions and maternal mortality. The perinatal complications are defined as the occurrence of stillbirth, which refers to the death of the foetus after 24 weeks of gestation, admission to the Neonatal Intensive Care Unit (NICU) and the incidence of neonates with low birth weight, which is categorized as very low birth weight ($\leq$1.5 kg) and low birth weight (<2.5 kg). A pre-designed document was utilized to record pertinent patient data, including age, obstetric history, anticipated delivery date, gestational period and conducted medical tests.

RESULTS

Table 1 represents the sociodemographic and obstetrical characteristics of the participants included in the study. Upon conducting an investigation into the distribution of patients, stratified by age groups, the age range of the majority (46.5%) of individuals falls between 21 and 25 years, while 33.0% of the sample population falls between the ages of 26 and 30. The age group with the smallest percentage, at 7.5%, is comprised of individuals aged 31-35 years, while the age group with the second lowest proportion, at 13.0%, is composed of individuals aged 18-20 years. The data indicates that the majority of the population resides in rural areas, comprising 74.9% of the total population, while the urban areas account for 25.1%. The study revealed that the majority of the participants, specifically 54.0%, were primigravida, while only a smaller proportion of 13.0% were classified as G4 and above. Additionally, the data indicated that the majority of the participants, specifically 54.7%, were primiparous, while the remaining 45.3% were multiparous. The 36-40 week period exhibits the greatest proportion (54.2%), while the 32-36 week period demonstrates a proportion of 22%. The group with the smallest percentage (1.7%) is comprised of infants born between 24-28 weeks, while the group born after 40 weeks constitutes the lowest proportion (17.3%).

Table 2 displays the clinical manifestation and maternal outcome of the participants in the study. The predominant manifestation of gestational hypertension was observed to be mild pre-eclampsia, succeeded by severe pre-eclampsia, gestational hypertension, antepartum eclampsia and a solitary instance of chronic hypertension. The allocation of patients according to the mode of delivery. The prevalence of spontaneous vaginal deliveries was 36.1%, while caesarean sections accounted for 34.2% of all deliveries. The proportion of induced vaginal deliveries was found to be lower, at 29.2%. Approximately 33.9% of the female participants in our study underwent a caesarean delivery. The study revealed that 37.6% of the female participants experienced maternal morbidity and mortality. The

Table 1: Socio demographic and obstetrical profile of patients under study

Particular/sub-particular	Frequency	Percentage
Age groups		
18-20 years	26	13.0
21-25 years	93	46.5
26-30 years	66	33.0
31-35 years	15	7.5
Locality		
Rural	150	74.9
Urban	50	25.1
Antenatal visits		
Booked	148	74.0
Unbooked	52	26.0
Gravida		
G1	108	54.0
G2 and G3	82	41.2
G4 and above	10	4.8
Parity		
Primiparous	109	54.7
Multiparous	91	45.3
Gestation age		
24-28 weeks	3	1.7
28-32 weeks	10	4.8
32-36 weeks	44	21.9
36-40 weeks	108	54.2
>40 weeks	35	17.3

Table 2: clinical presentation and maternal outcome

Particular	Sub-particular	Number	Percentage
PIH	GHTN	34	16.80
	Pre-eclampsia	100	50.00
	Severe pre-eclampsia	38	18.70
	Antepartum eclampsia	15	7.70
	Chronic hypertension	1	0.02
	Chronic hypertension superimposed with preeclampsia	2	1.20
	Impending eclampsia	10	5.00
Mode of delivery	Spontaneous vaginal	72	36.10
	Induced vaginal	59	29.20
	C-section	68	34.20
	Undelivered	1	0.50
Maternal complication	Eclampsia	15	7.70
	Abruption	22	11.00
	HELLP	6	2.80
	DIC	3	1.40
	ARF	4	2.00
	Wound Infection	18	9.00
	Death	7	3.60
Post-partum hospital stay in days	<7	120	60.00
	7-14	52	26.00
	15-28	20	10.00
	>28	8	4.00

Table 3: Fetal outcome

Fetal outcome	Number	Percentage
Shifted to mother side	97	48.2
Shifted to SNCU	83	41.6
IUFD	16	7.9
Still birth	4	2.1
Total	200	100.0

prevalent complications observed in the study were abruption, wound infection and eclampsia, constituting 11, 9 and 7.7% of the total cases, respectively. Additional concerns included HELLP syndrome, DIC (disseminated intravascular coagulation) and AKI (acute kidney injury). The study revealed a maternal mortality rate of 3.6%. The hospitalization period for the majority of women ranged from a minimum of three days to a maximum of 25 days, with an average duration of 1 week. The mean duration of hospitalization in a postpartum setting was 16 days.

The higher proportion 48.2% were for shifted to mother side, followed by 41.6% for shifted to SNCU.

The lower proportion 7.9% were for IUFD and least 2.1% for Still birth, respectively (Table 3).

DISCUSSIONS

The condition known as Gestational Hypertension has been observed to have an impact on both the mother and the neonate. This phenomenon represents a significant contributor to adverse health outcomes for both the mother and fetus. The study group revealed that 46% of the female participants belonged to the age bracket of 21-25 years. This finding is consistent with Moodley's previous study, which reported a mean age of 26 years. The mean age of participants in the studies conducted by Brown and Buddle[5], as well as Hall, was reported to be 26 years. The study found that the average age of the participants was 25 years. Pregnancy-induced hypertension (PIH) is a frequently encountered condition during the initial gestation. A majority of the participants in our research were Nulliparous, which accounts for 54% of the total sample. According to Brown and Buddle[5], pregnancy-induced hypertension (PIH) is more prevalent among women who have not given birth before. The study group revealed that a mere 66% of the female participants exhibited risk factors, such as nulliparity (54%) and other risk factors (12%), which encompassed a history of preeclampsia in a previous pregnancy, diabetes mellitus, obesity and a family history of hypertension. According to the research conducted by D.R. Hall (7), 36% of the female participants exhibited risk factors. Approximately 307 women, accounting for 74% of the sample population, were admitted for medical care either within our institution or at an external facility, as per the findings of this study. The provision of sufficient antenatal care plays a crucial role in mitigating complications through timely identification and proper intervention. Though the majority of female individuals underwent pregnancy termination during the gestational age range of 36-40 weeks, accounting for 54.2% of cases. According to the research conducted by Hall, the gestational age at the time of delivery was determined to be between 32-34 weeks. The Apgar score was observed to exhibit a positive correlation with advancing gestational age. A high incidence of fetal morbidity was observed during the initial stages of gestation. The administration of delivery is considered the definitive remedy for preeclampsia; however, it is imperative to consider the fetal outcome in cases where maternal complications are absent. Approximately 34% of the female participants in our research were subjected to caesarean section delivery. The reported rate is comparatively lower than the findings of Mashiloane and Moodley[6] where 81.5% of deliveries were conducted via cesarean section33.The primary objective of management in obstetrics is to ensure maternal safety, followed by the delivery of a viable neonate who does not necessitate extended neonatal care. The present investigation revealed a prevalence of 37.6% for maternal morbidity and 3.6% for maternal mortality. The highest recorded medical complications were abruption, wound infection and eclampsia, accounting for 11, 9 and 7.7%, respectively. Additional complications included HELLP syndrome, disseminated intravascular coagulation (DIC) and acute kidney injury (AKI). The study revealed a maternal mortality rate of 3.6%. According to a study conducted by Manisha in New Delhi in 2012, the incidence of maternal mortality was reported to be 1.8%. The total number of perinatal deaths, including stillbirths and neonatal deaths, is 57. The prevalence of perinatal mortality was calculated by dividing the total number of cases by the total number of babies and multiplying the result by 100, resulting in a prevalence rate of 13.8%. According to our research findings, 41.6% of infants necessitated admission to the neonatal intensive care unit. The study revealed that the most prevalent neonatal complications were respiratory distress syndrome (RDS) at a rate of 20%, hypoxic-ischemic encephalopathy (HIE) at a rate of 4%, intrauterine growth restriction (IUGR) at a rate of 22%, septicemia at a rate of 21% and neonatal mortality at a rate of 28%. The neonatal prognosis is contingent upon the quality of intensive care resources and the gestational age at the time of delivery. According to Witlin, there is a positive correlation between neonatal

outcomes in pregnancies complicated by pregnancy-induced hypertension (PIH) and increasing birth weight. Additionally, the incidence of respiratory distress syndrome decreases as gestational age increases. The majority of female patients necessitated a hospital stay lasting one week, with a minimum duration of three days and a maximum of 25 days. The average duration of postpartum hospitalization was 16 days. The extended duration of hospitalization for the majority of women was primarily due to the well-being of their newborn. According to the research conducted by Hall, the average duration of postpartum hospitalization was found to be 5 days.

CONCLUSION

The occurrence of PIH has been found to be a significant contributor to maternal and perinatal mortality. The onset of early Gestational Hypertension has been found to have a negative impact on both maternal and perinatal outcomes. Improved outcomes can be achieved through early detection of a less severe disease, the administration of corticosteroids and careful timing of delivery. Late-onset gestational hypertension is more prevalent. Early detection and timely delivery can decrease perinatal and maternal morbidity. The rates of PIH and eclampsia are gradually decreasing, however, they remain significantly higher than those observed in developed nations. The provision of antenatal and obstetric care has the potential to mitigate the occurrence of complications.

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