Original Article

Prevalence, Risk Factors of Gestational Hypertension of Pregnancy at Tertiary Care Teaching Hospital, India

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Abstract

Objective: To assess Prevalence, Risk Factors of Gestational Hypertension of Pregnancy at Tertiary Care Teaching Hospital, India. **Methodology:** Data collectors and lead researchers carried out the data collection. Obstetric history from the subjects was obtained based on interviewer-administered questionnaires. The demographic data were manually extracted and recorded on a structured and piloted form with an individual record number. We recorded the demographic characteristics, gravidity, parity, blood pressure measurements, gestational age, BMI, hypertension type, abortion history, maternal complications and presenting symptoms. The diagnosis of gestational hypertension was made based on its occurrence in the duration between antepartum and postpartum period. For the purpose of this study, two blood pressure readings were taken using a mercury sphygmomanometer and the average of both the recordings was taken**. Result:** Various risk factors such as obesity, family history, primigravida, multiple babies, kidney disease, pre-hypertensive and age were identified in the study population which made them more prone to get affected with PIH. PIH prevalence was found to be 22%. The mean age group with a high degree of PIH was found to be ≥ 25 years in 36.36% pregnant women. Women above the 20th week of the Period of gestation were found to be more prone. Obesity in around 72.26% was determined to be a major risk factor leading to preterm deliveries and complications. Pedal edema and headache were found to be the most common presenting symptoms in 45.45% and 31.81% respectively. The analysis of maternal and fetal outcomes recorded 22.72% fetal growth restriction and 13.63% with oligohydramnios as major complications. **Conclusion:** Prevalence of PIH was found to be high. There should be a proper system to provide antenatal and prenatal consultations and routine monitoring. Urinalysis must be carried out regularly in all pregnant women. Significant risk factors should be screened during the consultation for pregnancy.

Keywords: Prevalence, Risk Factors, Hypertensive disorders, pregnancy complications, pregnancy induced hypertension (PIH)

Introduction

Hypertensive issues are among the most well-known confusions happening during pregnancy and one of the most well-known purposes behind maternal and fetal mortality and bleakness comprehensively. Gestational hypertension (GH) requires exceptional diligence in the scenario of healthcare system globally; as it affects 30% of the pregnant women which results in increased morbidity and mortality risk [1]. World Health Organization (WHO) reports estimated 16% of maternal death due to hypertensive disorders [2]. Gestational hypertension also named as pregnancy-induced hypertension (PIH) is a condition indicating elevated blood pressure during pregnancy. GH creates following 20 weeks of incubation throughout work or during initial 48 hours of baby blues with no critical proteinuria [3]. Hypertensive Disorders of Pregnancy (HDP) are one of the five significant difficulties that cause about 60% to 80% of every single maternal deaths [1]. Studies show that HDP is the primary driver for maternal mortality and dreariness all round the world [2, 3]. The arrangement of HDP is troublesome in view of restricted information about its etiology and the absence of similarity of definitions [2, 3].

Hypertensive issues of pregnancy (HDP) are ordered as toxemia (PE), eclampsia, gestational hypertension, ceaseless hypertension and toxemia superimposed on interminable hypertension [1]. Several factors influencing the risk of preeclampsia among the gestating mothers include obesity, diabetes, kidney disease, multiple pregnancies, age greater than 30 years, primigravida, family history of preeclampsia, low socioeconomic status and chronic hypertension. The major complications observed in PIH are intra-uterine growth retardation, intrauterine death, premature delivery, and

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How to cite this article: Mirzaei, A., Bhojan, Ch., Kanafileskookalayeh, S., Siby, E. Prevalence, Risk Factors of Gestational Hypertension of Pregnancy at Tertiary Care Teaching Hospital, India. Arch Pharma Pract 2020;11(S4):47-51.

abruption of placenta, which are considered to be the most important causes of hospitalization [3].

Roughly 289,000 ladies kicked the bucket all around from pregnancy related causes in 2013, from which 99% of deaths happen in creating countries. Sub-Saharan African nations contribute for about 56% of every single maternal passing on the planet. A woman life time danger of passing on from pregnancy related entanglements in creating nations is14 times higher than in created nations [3].

These conditions extend from a mellow increment in circulatory strain at term with no extra signs or side effects to extreme entanglements with potential for huge maternal, fetal and neonatal damage [3]. Internationally, a critical number of ladies bite the dust each year from pregnancy-related causes and the greater part of these deaths happen in sub-Saharan Africa [4]. Roughly 12% of the maternal deaths are related with hypertensive issues in pregnancy, for example, pregnancy-initiated hypertension [1-4]. Thus, hypertension confusions are among the principle general medical problems around the world. PIH is considered to be the most prevailing disorders observed in pregnancy. Although commonly seen, these disorders can lead to life threatening conditions in both fetus and mother. In this study, an attempt has been made to document the symptoms and risk factors involved. As there is paucity of data on various factors associated with HDP, this present study aims at identifying strategies to reduce PIH and its complications.

Methodology

A prospective observational study was run in an antenatal care department for a period of six months at a 750 bedded multispecialty hospital, Coimbatore. This study protocol was approved by the Ethics Committee of the medical institution involved. All pregnant women with estimated gestational age above 12th week, admitted in the inpatient antenatal care ward were involved in the study. Women priorly diagnosed with hypertension or suffering from any chronic illness were exempted from the study. All women who had consented were briefed about the study nature. Confidentiality was assured and maintained throughout the study. A pre-tested, semi-structured schedule was used for interviewing the study subjects Data collectors and lead researchers carried out the data collection. Obstetric history from the subjects was obtained based on interviewer-administered questionnaires. The demographic data were manually extracted and recorded on a structured and piloted form with an individual record number. We recorded the demographic characteristics, gravidity, parity, blood pressure measurements, gestational age, BMI, hypertension type, abortion history, maternal complications and presenting symptoms. The diagnosis of gestational hypertension was made based on its occurrence in the duration between antepartum and postpartum period. For the purpose of this study, two blood pressure readings were taken using a mercury sphygmomanometer and the average of both the recordings was taken. Quantitative data was captured and analyzed. Microsoft Excel was used to generate the graphs.

Result and Discusion

Hypertensive disorders of pregnancy (HDP) are one of the most common complications occurring during pregnancy. This scenario has generally been observed more commonly in developing countries than in developed countries. The prevalence of PIH varies according to geographical areas of the world and ranges from 1.5% in Sweden to 7.5% in Brazil to 19.4% in Zimbabwe [3, 4]. As per our study, the frequency of HDP was 22%. These variations in the prevalence of PIH across different regions may be due to lifestyle differences, racial diversity, socioeconomic status, and the difference in antenatal care service accessibility.

Pooled factors such as mother's age of gestation, gravidity status, obesity or multiple fetuses were individually associated with a high prevalence of PIH. Young maternal ages were not associated much with PIH. This study shows that the risk of developing PIH was not associated with young age. But this ratio of age varied along with the geographical locations as it was made out from the studies carried out in Brazil, Cameroon, and Nigeria showed a higher risk for PIH among young women [5-7]. While studies from South Glam organ and Ontario showed lower risk associated with young women [8, 9]. From these studies, it was also visible that women aged ≥40 years, are two times more likely to develop pre-eclampsia than younger women which was also made out by a review conducted by WHO [10].

Obesity was found to be one of the contributing factors involved in increasing PIH in the current study. Studies by Berner and Saleh reviewed the risk of developing PIH that increased by ten times in pregnancy with obesity [11]. So, women with increased BMI would be at a merge of developing PIH during pregnancy. Gravidity status was found to be associated with PIH which was in consistency with other studies by Bilano, Ye C, and Reyes LM [10, 12, 13].

The prevalence of PIH is unevenly distributed throughout the period of gestation. The mean period of gestation at the time of presentation in our antenatal care ward was made out to be about 20th week of pregnancy in the majority of the patients which was comparable with a case reported from Japan [14]. The possibility of early onset of PIH could be due to the high association with severe preeclampsia.

This study also revealed those factors which also led a predisposing impact on PIH; positive family history and pre diagnosed hypertension before pregnancy. These findings were in-par with studies conducted in Ghana and Pakistan [15, 16]. This shows that family history and pre diagnosed hypertension had a strong association with PIH that could have occurred due to genetic predisposing factors.

Pedal edema was observed in 45.45%, as a major symptom in our patients. Edemas, as well as headache, were common

manifestations that could be seen in normal pregnancies [17]. Symptoms like blurred vision and bleeding were found to be the contributing factors of PIH, but the signs were found to be less as expected in other studies. We believe this could be possibly due to all information wouldn't have been necessarily documented. Maternal complications could affect multiple organ systems due to severe preeclampsia, together which are involved in medical complications and during the course of labor [18]. The increased risk of oligohydramnios made out from our study in pregnant women, suggests that routine amniotic fluid index monitoring to be recommended for women with severe preeclampsia as a precautionary step.

The mean age of the patients was 32.3±6.6 years, the average gravidity was 5.0, and the average parity was 3.0. [Table 1].

Table 1: Characteristics of women with hypertension disorder

Variables	Minimum	Maximum	Mean	SD
Age, years	16	46	32.3	6.6
Gravidity	1	12	5	2.7
Parity	0	10	3	2
Number of abortions	0	5	0.8	1.09
Gestational age, weeks	24	40	31.8	3.8
bMI, kg/m2	19	41	27	5.9
Systolic bP, mmHg	124	230	155.9	15.3
Diastolic bP, mmHg	66	127	93.1	11.2
Fetal weight, g	890	4700	2670	821
Apgar score at 1 minute	6	9	7.2	1.66
Apgar score at 5 minutes	7	11	8.5	0.88
Fetal head circumference, cm	21	38	30.1	3.4

Out of the 100 pregnant women whose information was sampled, 22 of them were identified with PIH based on the TGA (Therapeutic Goods Administration) guidelines, giving a prevalence of 22%. Our study showed that the prevalence of hypertension in pregnancy was found significantly higher in the age group ≥25 years (36.36%) than compared to <25 years age group (13.63%).

The pregnant women with a mean period of gestation (POG) >20 weeks were significantly found to be prevalent with PIH. No much difference was made out of the staging of hypertension. A significant association was found between the prevalence of PIH and increasing BMI of the participants. Women diagnosed with PIH had momentous weight gain compared to non-PIH patients. The prevalence of PIH differed based on the gravidity status, of 22 pregnant women 15(68.18%) were primigravid and 7(31.81%) were multigravida.

Various risk factors such as obesity, family history, primigravida, multiple babies, kidney disease, pre-hypertensive and age were identified in the study population which made them more prone to get affected with PIH. A similar study conducted by Minxue Shen et al (2017) [19] found that the risk factors for PIH including obesity, age >35 years, family history, history of prior caesarean section. The result shows that 7 patient (31.81%) were obese, 7 patient (31.81%) were below 20 years and above 40 years,15 patients (68.18%) were primigravida,1 patient (4.54%) was having kidney disease,2 patients (9.09%) were carrying multiple babies,3 patients (13.63%) were having family history of hypertension and 5 patients (11.71%) were having past medical history of hypertension. Table 2

Table 2: Risk Factors according to the type of hypertension disorder in pregnant women

Risk factor	No. of patients	Percentage (%)
Obesity	7	31.81%
Age (below 20 years &above 40 years)	7	31.81%
Primigravida	15	68.18%
Kidney disease	1	4.54%
Multiple babies	2	9.09%
Family history of hypertension	3	13.63%
Past medical history of hypertension	5	22.72%

Table 3: Period of Gestation of Study Patient

Gestational period	No. of patients	Percentage (%)
1st trimester	0	0
2nd trimester	4	18.18%
3rd trimester	18	81.81%

Pregnancy has three trimesters, each of which is marked by specific fetal developments. A pregnancy is viewed as full-term at 40 weeks; newborn children conveyed before the finish of week 37 are viewed as untimely. Untimely newborn children may have issues with their development and advancement, just as challenges in breathing and processing. In our study, 18.18% were diagnosed with PIH during 2nd trimester and 81.81% were diagnosed during 3rd trimester. Table 3

Table 4: Stage of Hypertension of Study Patient

Stage of hypertension	No. of patients	Percentage (%)
Normal	NIL	NIL
Pre-hypertension	NIL	NIL
Stage-I hypertension	12	54.54%
Stage-II hypertension	10	45.45%

To quantify your circulatory strain, your PCP or a master will typically put an inflatable arm sleeve around your arm and measure your pulse utilizing a weight estimating check. A

pulse perusing, given in millimeters of mercury (mm Hg), has two numbers. The first, or upper, number estimates the weight in your supply routes when your heart pulsates (systolic pressure). The second, or lower, number estimates the weight in your corridors between beats (diastolic pressure). In our study 54.54% were identified with stage-I hypertension and 45.45% were under stage-II hypertension. Table 4

Table 5: Complication of PIH of Study Patient

Complication of PIH	No. of patients	Percentage (%)
Acute renal failure	1	4.5%
Bleeding	2	9.09%
Fetal growth restriction	5	22.72%
Decreased fetal movement	2	9.09%
Oligohydramnios	3	13.63%
Premature delivery	2	9.09%
Liver problem	1	4.5%

The prevalence of personal and family histories of hypertension was not much prevailing; however, the association was found to be in 5 women (22.72%) with personal history and 3 women (13.63%) with family history. The frequencies of PIH symptoms in primigravida and multigravida women were not significantly different. Mostly they were presented with pedal edema (45.45%) and headache (31.81%). The analysis of PIH risk factors, maternal and fetal outcomes found that fetal growth restriction was a more prominent risk factor identified in 5 women (22.72%) followed by oligohydramnios in 3 women (13.63%). The prevalence of other maternal complications and mortality seen in PIH disorder types were not significantly different. Table 5

Table 6: Management of women with PIH

Medication	Mild PIH (BP140/90mmHg)	Severe PIH (BP ≥ 160/110mmHg)
No Medication/Bed rest	8	2
Methyl Dopa	10	6
Nifedipine	1	1
Methyldopa + nifedipine	2	1
Hydralazine	1	0

Methyldopa was the medication of decision for the executives of PIH. It was directed to 10 of the individuals who had mellow PIH and 6 with serious PIH. Methyldopa and nifedipine were given in mix to two ladies with mild PIH and one with extreme PIH. Hydralazine was given to one lady with mild PIH (Table 6).

Gestational age less than 30 weeks is likely to contribute to fetal mortality and morbidity [20]. This was consistent with the previous study stating decreased gestational age may lead to increased mortality and morbidity in the presence of expectant management [21]. On comparison with our results, it was evident that women with severe preeclampsia had an increased risk of IUGR which appears to be baleful rather than protective for neonatal survival. Interestingly, our results also revealed that marginally, bleeding and decreased fetal movement also contributed to the list of complications in PIH. Our study findings also demonstrated preterm deliveries in patients with severe preeclampsia. Similar studies by Chammas et al reported immediate delivery to be favorable in women detected with IUGR (Intra Uterine Growth Retardation) and LBW (Low Birth Weight) [22]. In our overview, antenatal and prenatal consultations and routine monitoring may outweigh the risks encountered by hypertensive disorders of pregnancy. Also possibly be benefitted with safer outcomes before pregnancy and delivery.

Conclusion

To conclude, the prevalence of PIH was observed to be high through the present analyses. This also highlights the fact that hypertensive disorders of pregnancy still remain unaddressed in India. Symptoms and risk factors identified from this present study can be utilized to screen the women at an early stage of pregnancy and also as a surveillance technique. This calls for the coordinated efforts of primary and other healthcare providers and close involvement of government and public health sectors. Poor knowledge of management of PIH and inadequate resources are a threat to the proper management of PIH.

Acknowledgement

We acknowledge S.N.R SON's charitable trust and Sri Ramakrishna hospital, Coimbatore for providing the facilities to carry out the study.

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