# Magnitude of Vascular Symptoms among Pregnant Women with Pregnancy Induced Hypertension (PIH) in Hilly Areas of Uttarakhand

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**ABSTRACT**

Pregnancy is considered as a normal physiological event and is typically, a time of joy and anticipation. Identifying the symptoms will help to screen the high risk cases at booking. It will help the health professionals to plan the suitable surveillance routine to detect preeclampsia for the rest of the pregnancy Methodology: Descriptive research design was used to assess the presence of vascular symptoms among pregnant women with Pregnancy Induced Hypertension (PIH). Pregnant women who diagnosed with pregnancy induced hypertension, belongs to hilly area, primigravida, gestational age between 26 – 30 weeks and experiencing at least three vascular symptoms, were included in the study. One hundred and six (106) women with pregnancy induced hypertension were selected for study by using purposive sampling technique. The tools used to collect the data were 1. Demographic questionnaire, 2. Scale to assess the Vascular Symptoms. To assess the magnitude of edema 4 point edema scale was used. To assess the head ache and epigastric pain numerical pain scale was used. Informed written consent was taken from each participant. Results: Half of the women (50%) had moderate BP, highest percentage (58.50%) of women had moderate proteinuria, almost half of the participants (56.60%) had moderate edema, more than one third of the participants (69.81%) had normal weight gain. Head ache depicts that highest percentage (40.57%) of women had mild head ache, one third (38.68%) of women had mild pain, two third (68.87%) of women had normal fetal growth or no IUGR, and 65.09% of women verbalized that they are experiencing Insomnia and 20.75% of the women verbalized that they are experiencing depression. Conclusion: The symptoms underlying evidence base can be used to assess risk at booking especially in hilly area. High quality antenatal care can be provided for those cases in order to minimize the complications in both mother and the fetus.

**Keywords:** *Hilly Area, Pregnant Women, PIH, Vascular Symptoms*

## INTRODUCTION

Pregnancy is considered as a normal physiological event and is typically, a time of joy and anticipation. But sometimes occurrence of risk or complications shatters the dreams of pregnant women and her family.[1, 2]

Every minute of every day, somewhere in the world, a woman dies from complications related to pregnancy or childbirth. That is, 3, 58,000 women, at a minimum, dying every year worldwide. Most of these deaths occur in developing countries, making maternal mortality the health statistic with the largest disparity between developed and developing countries. In India, one woman dies in every 5 minutes from a pregnancy related cause.[3]

Hypertension is one of the common medical complications of pregnancy and contributes significantly to maternal and perinatal morbidity and mortality. Hypertension is a sign of an underlying pathology which may be pre-existing or appears for the first time during pregnancy.[2]

PIH, a life threatening complication of pregnancy is a condition that typically starts after 20th week of pregnancy and is related to increased blood pressure (BP ≥140/90 mm Hg) and protein in mother's urine (urinary albumin protein ≥ 300 mg/24 h).[1,2]

Agarwal S, Walia GK (2014) stated the prevalence of PIH in various regions of India and showed that almost one-third of the respondents (n=11362; 28.7%) reported symptoms suggestive of pre-eclampsia. Rural-urban and marked geographic variation were found with rates for pre-eclampsia ranging from as low as 18.5% (Haryana) to 49.4% (Tripura). According to him, Uttarakhand holds the1[st]place in the prevalence of PIH in the northern region of India andalso it holds 5th place in all over the India.[4]

In the systematic Review on Pregnancy Hypertension the maternal symptoms evaluated were: headache (N=3 studies), visual disturbance (N=3), nausea or vomiting (N=2), right upper quadrant pain or epigastric pain (N=2), chest pain or dyspnoea (N=2), abdominal pain and vaginal bleeding (N=1), and hyper reflexia (defined as "vivid" deep tendon reflexes) or "non-specific viral symptoms" (not defined) (N=1 study each). The signs evaluated were oxygen saturation (N=1), and BP [N=3].[5]

Muti M et al stated that most common symptom experienced by the hypertensive women was a headache, among those 25 (52.1 %) had mild PIH and five out of the eight women with severe PIH reported the headache. Other symptoms experienced were epigastric pain (23.2 %), chest pain or dyspnoea (21.4 %), visual disturbance (19.6 %), vomiting (16.1 %) and dizziness (8.9 %). Edema was present in 39.3 % of the respondents who experienced PIH.[6]

Akaishi R et al stated that women with proteinuria preceding -PE were likely to exhibit greater proteinuria in the urine, greater water retention in the interstitial space and more enhanced coagulation–fibrinolysis, thus suggesting that they may constitute a more severe form of PE than women with Other-PE do.[7]

Elhameid AEMA et al stated that increased number of vessels affection was seen in pregnancy induced hypertension and associated with adverse pregnancy outcome as IUGR, prematurity, IUFD and early neonatal death. Umbilical artery Doppler with absent or reversed diastolic flow was ominous signs as both findings were associated with IUFD and neonatal death.[8]

Identifying the symptoms will help to screen the high risk cases at booking. It will help the health professionals to plan the suitable surveillance routine to detect preeclampsia for the rest of the pregnancy.

**Materials and Method**
Quantitative approach with Non experimental – descriptive research design was used to assess the presence of vascular symptoms among pregnant women with Pregnancy Induced Hypertension (PIH). The objectives of the study were to assess the presence of vascular symptoms among pregnant women with PIH and to associate the vascular symptoms with demographic characteristics of study participants. Pregnant women who diagnosed with pregnancy induced hypertension, belongs to hilly area, primigravida, gestational age between 26 – 30 weeks, is experiencing at least three vascular symptoms, willing to give written consent for the study & can understand and speak the Hindi language were included in the study. Pregnant women with convulsion and coma, with other chronic medical disorders were excluded from the study. After taking permission from the ethical committee and administrative authorities of SRHU University, study was conducted in Himalayan Hospital, Jolly Grant, Dehradun. One hundred and six (106) women with pregnancy induced hypertension were selected for study by using purposive sampling technique. The tools used to collect the data were 1. Demographic questionnaire, 2. Scale to assess the Vascular Symptoms. To assess the magnitude of edema 4 point edema scale was used. To assess the head ache and epigastric pain numerical pain scale was used. Informed written consent was taken from each participant. The data were analyzed by using descriptive and inferential statistics.

**Results:**
**Table No 1: Frequency & Percentage wise distribution of the demographic variables of pregnant women with PIH**

| S. No: | Variables | | Frequency | Percentage (%) |
|---|---|---|---|---|
| 1. | Age | 27 & below | 80 | 75.47 |
| | | 28-37 | 23 | 21.70 |
| | | 38-47 | 1 | 0.94 |
| | | 48 & above | 2 | 1.89 |
| 2. | Educational Status | No formal education | 8 | 7.55 |
| | | Primary | 8 | 7.55 |
| | | Secondary | 32 | 30.19 |
| | | Higher secondary | 25 | 23.58 |
| | | Graduate and above | 33 | 31.13 |
| 3. | Occupation | House wives | 94 | 88.68 |
| | | Working | 12 | 11.32 |
| 4. | Monthly family income (In Rs) | 36,997 & above | 5 | 4.72 |
| | | 18,498 – 36,996 | 21 | 19.81 |
| | | 13,874 - 18,497 | 28 | 26.42 |
| | | 9,249 - 13,873 | 34 | 32.07 |
| | | 5547 – 9248 | 10 | 9.43 |
| | | 1866 – 5546 | 8 | 7.55 |
| 5. | Type of family | Nuclear | 36 | 33.96 |
| | | Joint | 69 | 65.09 |
| | | Extended | 1 | 0.95 |
| 6. | Place of residence | Urban | 7 | 6.60 |
| | | Rural | 75 | 70.75 |
| | | Semi Urban | 24 | 22.65 |

Demographic characteristics of study participants shows that majority (75.5%) of the women belongs to the age group of 27 and below, 21.7% of women belongs to the age group of 28-37 years whereas, only 0.94% and 1.89% belongs to the age group of 38-47 and 48 & above respectively. Almost similar highest percentage of the women had the education of Graduate & above

(31.13%) and secondary education (23.58%), followed by 23.58% had higher secondary education and similar less than percentages (7.55%) had no formal education and primary education. Most of the women (88.68%) were housewives and only 11.32% were working.

Monthly family income of participant shows that highest percentage of the women had the family income of 9,249 - 13,873, followed by 26.42% had 13,874 - 18,497, 19.81% had the income of 18,498 – 36,996. Less than ten percentages (9.43%, 7.55% & 4.72%) of the women had the income of 5547 – 9248, 1866 – 5546 & 36,997 & above respectively.

Majority of the women (65.09%) belongs to joint family, 33.96% belongs to nuclear family whereas only (0.95%) belongs to extended family. Majority of the women (70.75%) belongs to rural area, 22.65% belongs to semi urban area and only 6.60% belongs to urban area.

**Table No: 2. Frequency & percentage distribution of magnitude of the Vascular Symptoms among Pregnant women with PIH**
**N=106**

| S. No | VASCULAR SYMPTOMS | | Frequency | Percentage (%) |
|---|---|---|---|---|
| 1. | Blood Pressure | a. 140/90 -149/99 mm Hg (Mild) | 11 | 10.38 |
| | | b. 150/100 -159/109 mm Hg (Moderate) | 53 | 50 |
| | | c. ≥160/110 mm Hg (Severe) | 42 | 39.62 |
| 2 | Proteinuria | a. +1 ( Mild) | 18 | 16.98 |
| | | b. +2 ( Moderate) | 62 | 58.50 |
| | | c. +3 and above ( Severe) | 26 | 24.52 |
| 3 | Edema | a. 1(Mild) | 29 | 27.36 |
| | | b. 2(Moderate) | 60 | 56.60 |
| | | c. 3 (Severe) | 17 | 16.04 |
| 4. | Weight gain (Per week) | a. 0.5(250gms)- 1 lb (500gms) (Normal) | 74 | 69.81 |
| | | b. 1lb(500gms) – 2lbs (1kg) (Mild) | 28 | 26.42 |
| | | c. > 2lbs (1kg) ( Severe) | 4 | 3.77 |
| 5. | Head ache | a. 0 ( No pain) | 16 | 15.09 |
| | | b. 1-3 ( Mild Pain) | 43 | 40.57 |
| | | c. 4-6 ( Moderate pain) | 37 | 34.91 |
| | | d. 7-10 ( Severe pain) | 10 | 9.43 |
| 6. | Epigastric Pain | a. 0 ( No pain) | 23 | 21.70 |
| | | b. 1-3 ( Mild Pain) | 41 | 38.68 |
| | | c. 4-6 ( Moderate pain) | 32 | 30.19 |
| | | d. 7-10 ( Severe pain) | 10 | 9.43 |
| 7. | IUGR | a. No IUGR | 73 | 68.87 |
| | | b. Mild | 31 | 29.25 |
| | | c. Severe | 02 | 1.88 |
| 8 | Insomnia | a. Absent | 37 | 34.91 |
| | | b. Present | 69 | 65.09 |
| 9. | Depression | a. Absent | 84 | 79.25 |
| | | b. Present | 22 | 20.75 |

Frequency & percentage distribution of magnitude of vascular symptoms among pregnant women with PIH shows that half of the women (50%) had moderate BP, followed by 39.62 % had severe BP where as only 10.38 % had mild BP. Regarding proteinuria, highest percentage (58.50%) of women had moderate proteinuria, followed by 24.52% had severe proteinuria and only 16.98% had mild proteinuria. Edema of pregnant women depicts that almost half of the participants (56.60%) had moderate edema, followed by 27.36 had mild edema and only 16.04% had severe edema.

Weight gain of pregnant women shows that more than half of the participants (69.81%) had normal weight gain and 26.42% had moderate weight gain & 3.77% had severe weight gain. Head ache depicts that highest percentage (40.57%) of women had mild head ache, followed by 34.91% had moderate head ache, 15.09% did not experience head ache where as only 9.43% had severe headache. Epigastric pain shows that highest percentage (38.68%) of women had mild pain, 30.19% of women had moderate pain and 21.70% did not experience pain, where as only 9.43% had severe pain. Regarding IUGR majority (68.87%) of women had normal fetal growth or no IUGR, 29.25% had mild IUGR and 1.88% had severe IUGR. 65.09% of women verbalized that they are experiencing Insomnia and 20.75% of the women verbalized that they are experiencing depression.

**Table No: 3 Association between the vascular symptoms with their selected demographic variables.**
**n = 106**

| S. No | Demographic Variables | | Mean± S.D | t & f value | p value |
|---|---|---|---|---|---|
| 1. | Education | No formal Edu. | 12.25 ± 4.097 | 1.548 | 0.194 |
| | | Primary education | 12.38 ± 4.406 | | |
| | | Secondary edu. | 10.34± 3.571 | | |
| | | Higher secondary | 09.28± 4.005 | | |
| | | Graduate and above | 10.67± 3.789 | | |
| 2. | Family Monthly Income | >36, 997 | 10.40 ± 2.793 | 2.245 | 0.056 |
| | | 18,498 -36,996 | 9.38 ± 3.025 | | |
| | | 13,874 – 18,497 | 9.61 ± 4.202 | | |
| | | 9,249 – 13,873 | 10.65 ± 3.567 | | |
| | | 5547 – 9248 | 12.30 ± 4.832 | | |
| | | 1866 - 5546 | 13.63 ± 3.852 | | |
| 3. | Occupation | House wife | 10.46 ± 3.964 | 0.245 | 0.807 |
| | | Working | 10.76 ± 3.334 | | |
| 4. | Type of family | Nuclear | 10.31 ± 4.077 | 0. 350 | 0.727 |
| | | Joint | 10.59 ± 3.809 | | |
| 5. | Residence | Urban | 9.29 ± 3.729 | 0.757 | 0.472 |
| | | Rural | 10.77 ± 4.122 | | |
| | | Semi urban | 9.96 ± 3.099 | | |

ANOVA and Independent sample "t" test were computed to find the association between the vascular symptoms with their selected demographic variables. There was no statistically significant association found between vascular symptoms with education (f = 1.548, p = 0.194), family monthly income (f = 2.245, p= 0.056), occupation (t = 0.245, p = 0.807), type of family (t = 0. 350 , p = 0.727) and residence (f = 0.757 , p = 0.472). It can be interpreted that the demographic variables did t have any influence on vascular symptoms.

**Discussion:**
This study result was supported by Saxena N, et al shows that out of 150 subjects the symptoms experienced by the precclamptic and ecclamptic mothers were convulsions (75), headache (66), vomiting (23), blurred vision (14), epigastric pain (11), feet edema (37), oliguria (13), generalized edema/ascites (03), high blood pressure.[9]

Natasha Ng , Cox S, Maiti S also stated that headache is a common presenting feature of hypertension in pre-eclampsia, patients may complain of severe frontal headaches, visual disturbances, epigastric pain most importantly sudden swelling (oedema) of face, hands and feet. [10]

Zafar H et al stated that the frequency of IUGR in patients with PIH was found to be 28%. Out of 14 cases having IUGR, maximum frequency of problem was found to be in age group 21-30 years i.e. 78.6%. 57.1% of patients with IUGR were primigravida. And also he stated that prevalence of IUGR in excess of 20% has been recommended as cutoff point for triggering public health action. [11]

Mishra N stated in his study that out of 100 women, PIH cases were 78, including 35 Preeclampsia, 10 Preeclampsia with IUGR, 27 gestational hypertension (GHTN) and 06 GHTN with IUGR. Total IUGR cases were 38 including 22 without hypertensive disorder.[12]

Patil T et al conducted study on 50 PIH women with gestational age more than 28 weeks to assess the resistance index by serial Doppler ultrasonography as a part of antenatal fetal monitoring. The three vessels studied were uterine artery, umbilical artery and fetal middle cerebral artery. Study result shows that nearly two-third cases showed abnormal resistance index which indicate the IUGR.

Out of the 36 Doppler positive cases, 27 cases (75%) showed positive umbilical artery Doppler.[13]

Bakhda RN et al stated that ocular involvement is common in majority of cases of PIH. Most common symptoms are blurring of vision, photopsias, scotomas, and diplopia. Ocular involvement includes conjunctival vascular anomalies, hypertensive retinopathy, exudative retinal detachment, vitreous and pre-retinal haemorrhages, ischemic optic neuropathy and hypertensive choroidopathy. This was contradictory to present study findings.[14]

Khazaie H et al stated that different kinds of sleep problems can occur in subjects with preeclampsia in comparison with the non-pregnant and healthy pregnant subjects. Sleep problems should be evaluated during pregnancy, particularly in pregnant women with preeclampsia and suitable treatment should be provided for any specific sleep problem.[15]

Hoedjes M et al stated that after mild preeclampsia, 23% reported postpartum depressive symptoms at any time up to 26 weeks postpartum compared to 44% after severe preeclampsia (unadjusted odds ratio [OR] 2.65, 95% confidence interval [CI] 1.16-6.05) for depression at any time up to 26 weeks postpartum (unadjusted OR 2.57, 95% CI, 1.14- 5.76) while accounting for longitudinal observations. [16]

**Conclusion:**
Pregnancy Induced Hypertension continues to be a major problem, particularly in developing countries contributing significantly to high maternal and perinatal morbidity and mortality. Antenatal care has been identified as the single intervention which could influence the maternal mortality of our country**.** The symptoms underlying evidence base can be

used to assess risk at booking especially in hilly area. High quality antenatal care can be provided for those cases in order to minimize the complications in both mother and the fetus.

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