Sociodemographic Characteristics of Pregnancy Induced Hypertension: An Observational Study in the Kolhapur Population

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Abstract

Backgrounds: Pregnancy Induced Hypertension (PIH) is the foremost cause of maternal and neonatal mortality. Research suggests PIH is associated with different socio-demographic parameters. However, there is a paucity in the data regarding the socio-demographic characteristics of pregnancies affected by hypertension. This study aimed at evaluating socio-demographic characteristics of PIH in Kolhapur district, Maharashtra.

Materials and Method: Pregnant women (n=150) with Blood Pressure >140/90 mm of Hg after 20 weeks of gestation and willing to give consent were included. Those not willing for follow up, patients with history of obesity, chronic hypertension, coronary heart disease were excluded. Data collection was done using pre-designed, pre-tested questionnaire comprising of questions on sociodemographic parameters. Association between variables was calculated by chi square test and P-values < 0.05 were considered significant.

Results: Mean age of the participants was 22.57 ± 3.68 years, 81% suffered from mild PE (n=122) and 62% were primiparas (n = 93). 97% of them belonged to the rural background, and most of them were literate (n=107, 71.33%). 52% (n=82) belonged to Class I status. Neonatal outcome was normal is most (n=137), preterm births (n=18), intrauterine growth restriction (IUGR) (n =31), in neonatal intensive care unit (NICU) (n=15). Sociodemographic parameters and PIH showed no association.

Conclusion: Primipara women had higher incidence of pregnancy induced hypertension. However, pregnancy induced hypertension did not seem to have any association with the socio-demographic variables.

Keywords: *Blood Pressure, Hypertension, intrauterine growth restriction*

Introduction

Pregnancy related hypertension (PIH) is classically defined as a condition where systolic blood pressure (SBP) >140 mm of Hg and a diastolic blood pressure (DBP) >90 mm of Hg is diagnosed.[1] As per the Canadian Hypertension Society, PIH can be referred to any one of pre-existing hypertension, gestational hypertension and Pre-eclampsia (PE), pre-existing hypertension with gestational hypertension and proteinuria and unclassifiable hypertension. [2]

PE and eclampsia are the primary culprits of maternal and perinatal mortality and morbidity. PIH is known to affect about 6-10% of all pregnancies. [3] Most common pathologies related to PE are haemolysis, elevated liver enzymes and low platelet count (HELLP) or partial HELLP syndrome. Furthermore, haemorrhagic stroke and pulmonary oedema have been

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reported as the primary causes of mortality in eclamptic women. [4] Other maternal short-term complications include dysfunction of the central nervous system, acute disseminated intravascular coagulation (DIC), cerebrovascular events, hepatocellular injuries, oliguria, pulmonary oedema, placental abruption, and thrombocytopenia. [5] Complications associated with PE are more prominent when in early-onset (<32 weeks of gestation) PE as compared to late-onset PE.[6] Women with PIH are predisposed to several other conditions such as hypertension, cardiovascular disease (CVD), diabetes mellitus and renal diseases later in life. [7]

PIH is the most prevalent cause of maternal death in Europe. [8] It was third among the leading causes of maternal deaths in a tertiary centre in India. [9] Savitz et al showed that women who were Hispanic and Black were at a higher risk of PIH compared to white women. A reduced risk was seen in Asian women. The study also suggested a positive correlation between pre-pregnancy weight and risk of PIH. [10]

There have been previous studies in India which have demonstrated associations of PIH with several biochemical and haematological parameters. [11,12] However, studies relating to PIH with socio-demographic variables are rare. As it is known that PIH is affected by socio-demographic variables, there is a need to study this aspect of PIH across different regions of India, and thereby developing strategies to prevent it. [13] Here, we studied the socio-demographic characteristics of women suffering from PIH in tertiary care centre in Kolhapur district of Maharashtra.

Methods

The prospective observational study was undertaken at the Department of gynaecology and obstetrics, at a tertiary care hospital, Kolhapur, for a period of two years. A total of 150 women were selected by random sampling method and enrolled in the study, post the approval from the institutional ethical committee. An informed and written consent was obtained from them. All pregnant women with BP>140/90 mm of Hg after 20 weeks of gestation and giving consent were included in the study. Those not willing for follow up, patients with history of obesity, chronic hypertension, coronary heart disease, impaired renal failure, Smokers and alcoholics were excluded.

The data was collected using predesigned and pretested questionnaire comprising of two parts. The first part had details of socio demographic characteristics like name, age, residence etc. Second part included the general physical and detailed systemic examination findings. Sociodemographic variables were classified based on modified Kuppuswamy classification. [14] Severity of PIH were classified based on symptoms, signs, and other investigations.

The data was analysed on MS-Excel package 365. The qualitative variables were expressed in terms of percentages. Quantitative variables were categorised and expressed in terms of percentages or in terms of mean and standard deviations. Association between variables was calculated by chi square test. P-values below 0.05 were considered significant.

Results

The mean age of the participants in the study ranged from 18-32 years with a mean age of 22.57 ± 3.68 years. A significant number were ≤25 years of age ($P= 2.20e^{-16}$). There were 112 patients suffering from mild PE (SBP 140-149, DBP 90-99 mmHg), 24 from severe PE (SBP 150-159, DBP 100-109 mmHg) and 4 from eclampsia (SBP ≥160 and DBP ≥110 mmHg). Participants in the study group were classified according to their socio-demographic parameters in order to assess their impact on the incidences of PIH.

Majority of participants in the study were between 21-25 years of age (n=66), followed by women between 18-20 years. A significant proportion of the sample (62%, n=93) were primiparas ($P=5.31e^{-5}$) and 97.33% (n=146), belonged to rural background (P=2.20e-16). There were 6% (n=9) of patients who had a history abortion, and 2.67% (n=4) had a history of still birth in the past.

The mean SBP was 149.11 ± 9.31mm of Hg and mean DBP was 90.67 ± 2.50 mm of Hg. About 22.67% had SBP and 2% (n= 3) of them had more than 180 mm of Hg. Likewise, 6.67% (n=10) of the patients had diastolic blood pressure more than 100 mm of Hg in the present study. Maximum number of women were affected with mild PE (n=122, 81.33%), 24 had severe PE (16%) whereas 4 of them (2.7%) suffered from eclampsia.

More than half (54.67%, n=82), of the participants were of Class-I, i.e. upper class . A significant fraction of the sample was poorly educated (middle school or below, $P=3.47e^{-13}$). As many as 136 patients showed PIH related symptoms. The most common symptom was pedal oedema (n=40), followed by abdominal pain (n=31) and epigastric discomfort (n=22). A complete account of the symptoms has been depicted in figure 1. However, no association between PIH (PE and eclampsia) and sociodemographic variables was noted. Chi-square test between PIH and the variables, returned a P-value >0.05.

Most women had normal deliveries (91.33%, n=137), while 13 had Lower segment Caesarean section (LSCS). Mean birth weight of the babies was 2.57 ± 0.44kgs. A total of 65 neonates (43.5%) presented complications (figure 2).

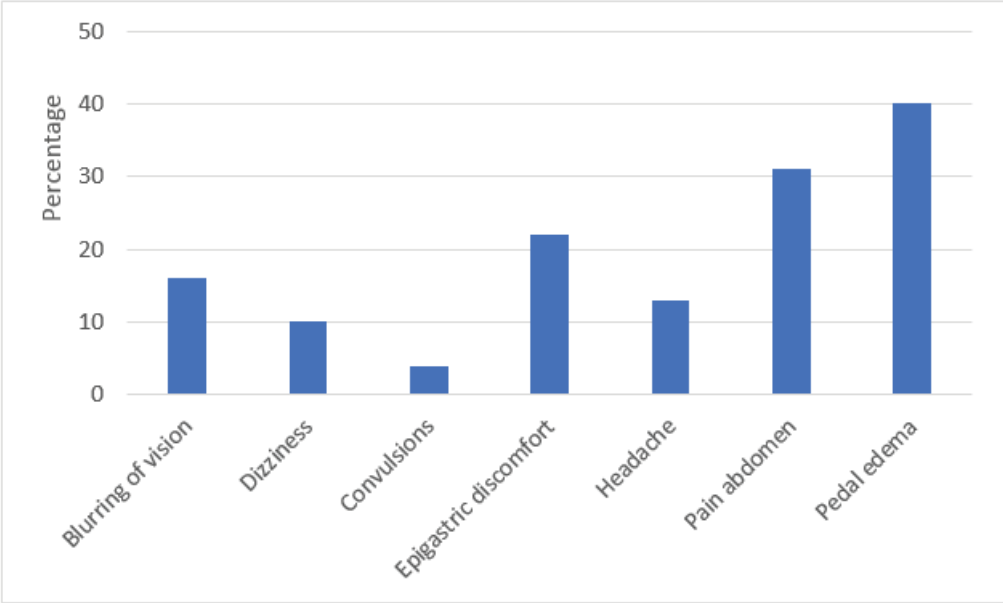

Figure 1. An account of the PIH symptoms in participants

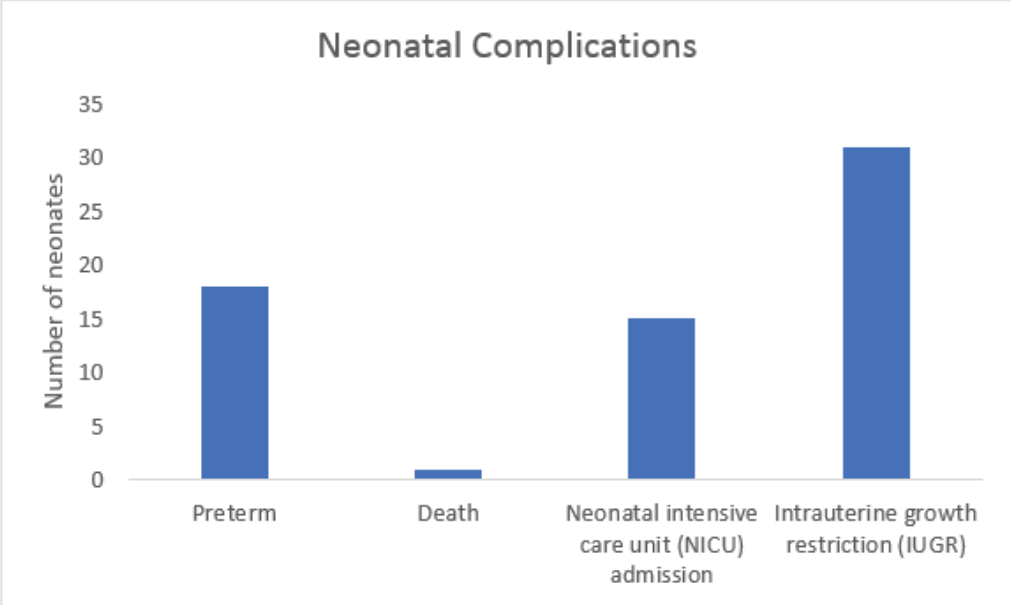

Figure 2. Distribution of neonatal complications

Discussion

PIH is one of the leading causes of foetal and maternal mortality all over the world. The estimates of the mortalities are much higher in developing countries of Asia (varying between 20-80 %), than the rest of the world.[15,16] PIH is affected by a number of factors, sociodemographic being one of them. In India, the incidence of PE was estimated to be 8-10 % of the total pregnancies. [17] Although, studies emphasizing the biochemical factors and PIH have been numerous, reports relating to the effect on socio-demographic variables have been few.[12,18] As demographics can impact PIH, region-specific studies will help in preventive measures

Concurrent with the present study, the mean age of women in PIH group was 23.8 years in a study by Manjusha et al, in the Pune district of Maharashtra. Additionally, a significant number were ≤25 years ($P= 2.20e^{-16}$). [19, 20] However, in a particular study in north India by Mehta et al, incidences of PIH was found in women >25 years of age. [21] In the present study, only 4.67% (n=7) were >30 years of age. This bias could be explained as a lesser prevalence of pregnant women above 30 years in the studied region. However, in Iran, a considerable number of participants were above the age of 35 years. [22] In a survey on maternal hypertension, there were 32% Chinese and Filipinos, 37% Koreans, and 49% Japanese mothers who were above 35 years suggesting ethnic differences between PIH age groups. [13]

PIH was classically proposed as a disease of the first pregnancy. [23] Herein, it is reported that a significant number ($P=5.31e^{-5}$) of women were primiparas (62%). This is consistent with several other previous studies who reported number of incidences of primiparas ranging from 52-73%. [19-21] Previous literature suggests, risk of PE in primiparas in almost twice is higher than those in multiparas [24]. However, a recent report also suggested that the data for the impact of parity in PE were conflicting and both nulliparas and multiparas were predisposed to PE risk [5]

Herein, a significant number of women ($P=2.20e^{-16}$) belonged to a rural background. A study by American Society of Nephrology states that women in rural areas have increased incidence of PIH. [25] Studies by Jena et al and Bangal et al also report similar findings in the eastern and western regions of India respectively. [26,27]. Conflicting trends were reported for Africa where rural women in Nigeria . [28, 29] Factors like poverty, poor availability of health care facilities and lack of awareness regarding PIH in the rural population could be responsible for the higher incidence of PIH in the rural population.

Likewise, education and socio-economic status has also been shown to be associated with the incidences of PIH. [30] A major population of women were poorly educated (middle school or below, $P=3.47e^{-13}$) although we did not find any significant association between education and PIH similar to Ramesh K et al. [20] In studies outside India illiterate and poorly educated women were seen to be at a higher risk of PIH. [13,30]. In India however, literate women are more predisposed to the risk of PIH and is explained by the rising levels of stress at work and college.[21,20,30,31] This is also in part linked to the knowledge and awareness regarding their health issues and PIH in women. Many cases of PIH among illiterate women go unnoticed and unreported due to their ignorance. [31,12] Likewise, low socioeconomic status has been linked to increased risk of PIH, which is in contrast this study, wherein a significant population despite belonging to the upper class suffered from PIH.[12,31,20] As most patients belonged to the rural background, lack of proper healthcare facilities in spite of being economically sound, could be a plausible explanation for this.

As regards the symptoms, pedal oedema has been reported to be one of the main symptoms in patients with pregnancy induced hypertension, concurrent with our study. Other prevalent symptoms include headache and blurred vision and epigastric pain. [32] Patients suffering from PIH have also been shown to present several neonatal complications like IUGR, pre-term births and even death of the neonates in few cases. [33] Our study was in line with these and a considerable number of neonates had IUGR while a few were also preterm births.

Over-all the study demonstrated that PIH was more prevalent in women who are below 25 years, belong to rural areas, primipara and poorly educated. There seems to be a need to improve awareness among women about their health during pregnancy. Also, as a major part of India is covered by rural population, more

women healthcare centres at rural level are needed to be established to provide accessible healthcare facilities to these women in their locality. Our study provides a broad idea about the factors related to PIH. Similar studies with a larger sample size and/or multi-centres would be able to give a clearer picture of all the parameters affecting PIH.

Conflicts of Interest: The authors declare that they have no conflict of interest.

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