

Identifying the risk factors for the prevention of hypertensive disorders in pregnancy in a tertiary care hospital: A cross-sectional study

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ABSTRACT

Introduction: Hypertensive disorders in pregnancy accounts for maternal morbidity and mortality globally. **Aim and Objectives:** We conducted this study to know the demographic profile and risk factors pertaining to lifestyle and behavioral aspects for hypertension among the pregnant women. **Methodology:** It was a hospital-based cross-sectional study. During the routine antenatal checkups, those antenatal cases found hypertensive, were included in the study after taking written consent. A semi-structured questionnaire was prepared and pretested before conducting the actual study. Statistical analysis was done by SPSS (version 17) software. Participants' sociodemographic characteristics were described using descriptive statistics. Results are presented using graphs, tables, mean, percentages, standard deviation, frequency, and significance. **Results:** We observed that most of the study subjects 110 (48.9%) were educated up to secondary level followed by primary level 47 (20.9%) while 25 (11.1%) of the subjects were illiterate. We also found that 113 (50.2%) of the study subjects consumed additional salt in their diet and 57 (25.3%) of the study subjects had a history of intake of visible fat. Among 225 study subjects, 174 (77.3%) did not consume tobacco in any form. Among the 225 study subjects, 142 (60.9%) did not have a family history of hypertension. It was observed that 121 (53.77%) subjects had normal BMI while 16 (7.11%) subjects were underweight while 51 (22.6%) subjects were pre-obese. A total of 32 (14.22%) subjects were obese class 1 followed by 5 (2.22%) subjects who were obese class 2. It was observed that among 225 study subjects, 155 (68.9%) subjects had mild hypertension while 70 (31.1%) subjects had severe hypertension. **Discussion:** The scarcity of data regarding hypertension in pregnancy in low and middle income countries despite this, a comparatively high prevalence of hypertension in pregnancy was observed due to behavioral risk factors, which is mostly preventable at the primary care level. **Recommendations:** It is possible to prevent PIH by eliminating behavioral risk factors through education and counseling to the pregnant ladies, at the primary care level by family physicians or primary care physicians which will reduce maternal mortality to a great extent.

Keywords: Hypertensive disorder, pregnancy, tertiary care hospital

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Introduction

Pregnancy-induced hypertension (PIH), hemorrhage, and pulmonary embolism are attributable to the three leading causes of maternal death globally.^[1-3]

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Approximately 5,29,000 women die per year due to pregnancy-related issues, worldwide.^[4] Hypertensive disorders of pregnancy are one of the foremost causes (10–15%) of maternal morbidity and mortality, which are mostly preventable.^[5] As per the World Health Organization (WHO), at least one mother dies every 7 min due to such disorders.^[6] The incidence of preeclampsia in India varies widely from 5–15%. The incidence in primigravidae is about 10% and in multigravida about 5%. The incidence of eclampsia in India ranges from 1 in 500 to 1 in 30.^[7] Preeclampsia is an interplay of various factors like maternal vascular disease, primary immunogenic, and increased trophoblast. One or more of it contributes to the development of PIH.

Need and scope of the study

Hypertension among pregnant women both in urban and rural areas tend to be diagnosed later and receive inadequate healthcare compared to developed countries. Unfortunately, the detection and management of hypertension in pregnancy get little priority in low and middle income countries, like India, which are still struggling with other poverty-related health problems. Fortunately, hypertension in pregnancy is a preventable disorder if only those at risk of developing it can be identified early in the antenatal period and managed appropriately at the primary care level by the family physicians or primary care physicians. The results of this study can be useful to strengthen the primary care, to allow rational planning towards early detection of PIH to improve perinatal management, and to reduce PIH incidence in our country and adverse events that follow it. With this background, we conducted this study to determine the risk factors leading to hypertension among pregnant women attending antenatal care (ANC) in tertiary care hospitals.

Materials and Methods

This cross-sectional study was conducted at the department of obstetrics and gynecology, in a tertiary care hospital, Mumbai. The study was conducted for over 1 year. Ethical clearance was taken from the institute ethical committee. We included antenatal mothers who were diagnosed with hypertension or high blood pressure (BP) in our study. Informed written consent was taken from all the patients and demographic details with clinical history were obtained. Patients below 18 years of age, mentally incompetent to give a clinical history or unwilling to participate were not included in the study.

BP measurements were taken in a sitting position in the right arm after a 5-min rest using a non-mercury sphygmomanometer and required cuff size. Two readings were taken 5 min apart and then we measured the mean BP. Hypertension was defined as systolic blood pressure (SBP) >140 mmHg and or diastolic blood pressure (DBP) >90 mmHg or was a known case of hypertension. About 225 sample sizes were calculated using the formula $n = 4PQ \times N/L \times N - 1 + 4PQ$, where P = Prevalence of hypertension in pregnancy, L is an allowable error, and N is the total population (6000) of patients attending

ANC outpatient department (OPD) in tertiary care hospital during six months.

A consecutive 225 pregnant women who presented to OPD with hypertension in pregnancy during the data collection period (six months) were included for the study. Statistical analysis was done by Statistical Package for the Social Sciences (SPSS) (version 17) software. Participants' sociodemographic characteristics were described using descriptive statistics. Results are presented using graphs, tables, mean, percentages, standard deviation, frequency, and significance.

Results

We found that the majority of the study subjects 90 (40.0%) belonged to 20–24 years, followed by 67 (29.8%) and 16 (17.1%) 25–29 years and ≤ 19 years, respectively, whereas 26 (11.6%) of the subjects belonged to each age group of 30–34 years and 35 and above years. None of the study subjects were below 18 years of age. The majority of the study participants 136 (60.4%) were of Hindu religion followed by Muslim religion 47 (20.9%). Buddhist religion constituted 39 (17.3%) of study participants followed by Christian religion 3 (1.3%). It was observed that most of the study subjects 110 (48.9%) were educated up to secondary level followed by primary level 47 (20.9%) while 25 (11.1%) of the subjects were illiterate. The subjects with the education of higher secondary were 25 (11.1%) followed by graduate subjects 18 (8%). Most of the study subjects 189 (84%) were housewives followed by businesswomen 19 (8.4%). The rest of the study subjects 13 (5.8%) were laborers and 4 (1.8%) in the service sector. The majority of the study subjects belonged to the upper lower class 112 (49.8%) and lower-middle-class 72 (32%) followed by upper-middle-class 33 (14.7%) while only 5 (2.2%) and 3 (1.3%) subjects belonged to upper class and lower class, respectively. A majority of them 131 (58.2%) were primigravida, followed by gravida three 42 (18.7%), gravida four 22 (9.8%), gravida five 16 (7.1%), and gravida two 14 (6.2%). It was observed that the majority of the participants 184 (81.8%) were mixed in their dietary habits followed by 41 (18.2%) vegetarian. We found that among 225 study subjects, 167 (74.2%) did not exercise. Among those exercised, 41 (18.2%) subjects exercised for ≤ 3 days per week while 17 (7.6%) subjects exercised for ≥ 4 days per week. The exercise here means intentional walking for at least 30 min per day. Among 225 study subjects, 174 (77.3%) did not consume tobacco in any form. Among those who consumed, every subject 51 (22.7%) consumed a smokeless form of tobacco. Sugar candy (mishri) and chewing tobacco were the smokeless form of tobacco used. None of them consumed any other form of tobacco. Among the 225 study subjects, 142 (60.9%) did not have a family history of hypertension. Among the subjects who had a family history, a maximum of 46 (21.3%) had hypertension in mother followed by father 26 (11.6%). About 11 (6.2%) had hypertension in both father and mother [Figure 1]. We also found that 113 (50.2%) of the study subjects consumed additional salt in their diet. Nearly 57 (25.3%) of the study subjects had a history of intake of visible fat and 217 (96.4%) of the study

subjects consumed tea while 119 (52.9%) of the study subjects had a history of consuming junk food [Figure 2]. It was observed that 121 (53.77%) subjects had a normal body mass index (BMI) while 16 (7.11%) subjects were underweight while 51 (22.6%) subjects were pre-obese. A total of 32 (14.22%) subjects were obese class 1 followed by 5 (2.22%) subjects who were obese class 2. [Table 1]. It was observed that among 225 study subjects, 155 (68.9%) subjects had mild hypertension while 70 (31.1%) subjects had severe hypertension. [Table 2]

Discussion

Hypertensive disorders in pregnancy have devastating health outcomes. Fortunately, this is preventable to a large extent if it can be identified early during the antenatal period and it can be managed in the primary care level also by family physicians. Hypertensive disorders in pregnancy need to be identified as early as possible to avoid unfavorable pregnancy outcomes. So, it is the need of the hour to address the magnitude and risk factors of hypertension in pregnancy. However, there is a research gap about the exact prevalence of hypertension during pregnancy in Indian literature. Keeping these points in mind, we conducted this study to know the sociodemographic profile, selected risk factors pertaining to lifestyle and behavioral aspects for hypertension among pregnant women. The results of this study can be useful to strengthen the primary care, to allow rational planning towards early detection of PIH to improve perinatal management, and to reduce PIH incidence in our country and adverse events that follow it.

We found that most of the hypertensive women were between the younger age group of 20 to 24 years. A study conducted by Manjusha *et al.* (2014) showed that maximum hypertensive patients were found in the age group of 18-22 years (41.3%) and least above 32 years (3.8%).^[8] The majority of the study participants 136 (60.4%) were of Hindu religion followed by Muslim religion 47 (20.9%). Analogous findings were observed in a study conducted by Barode *et al.* (2014).^[9] A study by Sachdeva *et al.* (2011) observed that a higher incidence of PIH was observed among the literate group of women.^[10] It was similar to our study. A high prevalence of hypertension among antenatal cases and

similar findings were observed by Fang, *et al.* (2009).^[11] Similar to our study, Ali Amir *et al.* (1998) in their study findings observed that women belonging to lower socioeconomic class were more vulnerable to the development of PIH.^[12] Khalifa *et al.* (2011) observed that a pattern of the diet which includes, no adequate intake of fresh fruits and vegetables (odds ratio [OR] = 1.85), high intake of fats (OR = 1.83), and high intake of salt (OR = 1.99) are considered as significant risk factors.^[13] These were similar to our study. Owiredu *et al.* (2012) in his study reported that a family history of hypertension is associated with developing PIH (7 times more) as compared to normal.^[14] Parmar *et al.* (2012) observed that the incidence of PIH was also associated with obesity.^[15] Most of the participants were taking a higher amount of salt in their diet. Comparable results were observed in studies conducted by Bhattacharya *et al.*^[16-21] Study done by Barode *et al.* (2014) revealed almost similar results. Nearly 70.5% of the study subjects had mild hypertension and 29.5% had severe hypertension.^[12]

Conclusion and Recommendation

The prevalence of PIH is increasing in the low and middle income countries. The only sustainable approach to tackle this problem is to adopt a healthy lifestyle, dietary modifications, and early diagnosis and treatment at the primary care level by family

Table 1: Distribution of study subjects according to basal metabolic index

Classification	BMI	No. of subjects	Percentage (%)
Underweight	<18.50	16	7.11
Normal	18.5-24.99	121	53.77
Pre- obese	25.00-29.99	51	22.66
Obese class 1	30.00-34.99	32	14.22
Obese class 2	35.00-39.99	05	2.22
Obese class 3	≥40.00	00	00
Total		225	100

Table 2: Distribution of study subjects according to the severity of hypertension

Hypertension	No. of subjects	Percentage
Mild Hypertension	155	68.9
Severe Hypertension	70	31.1
Total	225	100

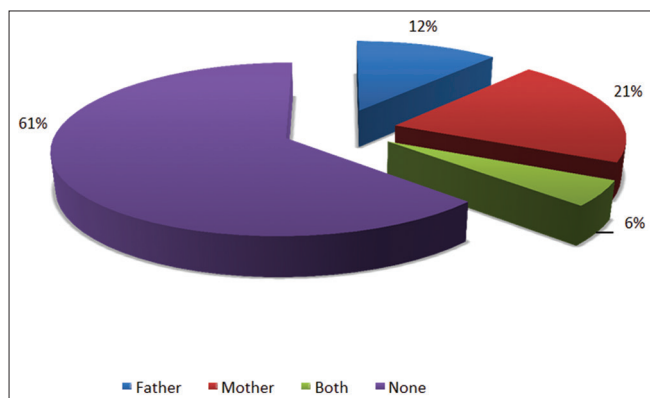


Figure 1: Distribution of study subjects according to a family history of hypertension

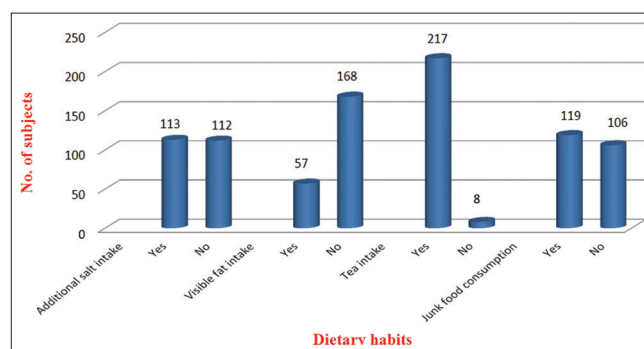


Figure 2: Distribution of study subjects according to dietary pattern

physicians. Nutritional counseling is essential for the mothers and it should be conducted by a dietician in the ANC OPD along with education regarding healthy dietary habits during pregnancy and afterward. Pregnant women should be sensitized to receive complete antenatal, natal, and postnatal care including institutional delivery to prevent mortality and morbidity in mothers as well as the child.

Ethical approval

Taken from IEC.

Declaration of patient consent

Taken from all participants.

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Conflicts of interest

There are no conflicts of interest.

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