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Original Research Article

Proportional distribution and sociodemographic profile of hypertensive disorders of pregnancy: a hospital-based cross-sectional study in Udaipur, India

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ABSTRACT

Background: Hypertensive disorders of pregnancy (HDP) are a leading cause of maternal and perinatal morbidity and mortality, particularly in low-resource settings. Understanding the socio-demographic and clinical profile of affected women is essential for early detection, targeted care, and improved outcomes. The objective of this study was to determine the proportional prevalence, distribution of different types of hypertensive disorders in pregnancy and their socio-demographic profile.
Methods: A cross-sectional observational study was conducted among 210 pregnant women diagnosed with HDP at Pannadhay Zanana Hospital, RNT Medical College, Udaipur. Data were collected using structured forms from labour rooms, PNC wards, and OT records. The types of HDP were classified as chronic hypertension, gestational hypertension, preeclampsia, and eclampsia.
Results: Among the 210 respondents, gestational hypertension (50.5%) was most common, followed by preeclampsia (34.3%), eclampsia (10.0%), and chronic hypertension (5.2%). Majority were from joint families (57.14%), lower-middle SES (50.5%), and had parity ≤2 (94.7%). The most affected age group was 28-32 years (33.8%). Regarding BMI, 24.2% were obese and 27.1% were overweight.
Conclusions: Gestational hypertension constituted the highest proportion, followed by preeclampsia, eclampsia, and chronic hypertension. Most affected women were in the 23-32-year age group, belonged to lower middle and upper lower socioeconomic classes, and a considerable proportion were overweight or obese, highlighting the sociodemographic distribution of hypertensive disorders of pregnancy in a hospital-based setting.

Keywords: Hypertensive disorders of pregnancy, Maternal health, Pregnancy, Sociodemographic profile

INTRODUCTION

Hypertension in pregnancy is defined as: "systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg, which is generally checked within four hours apart measurement".[1] Hypertension contributes to approximately 15% of pregnancy-related complications and can range from mild blood pressure elevation to severe conditions associated with significant maternal, fetal, and neonatal morbidity.[2]

The American College of Obstetricians and Gynecologists (ACOG) and the World Health Organization (WHO) classify hypertension in pregnancy into four categories: chronic hypertension, gestational hypertension, preeclampsia/eclampsia, and superimposed preeclampsia/eclampsia.[3]

Chronic hypertension is present before pregnancy or before 20 weeks of gestation and may later be complicated by preeclampsia, termed superimposed pre-eclampsia. Gestational hypertension develops after 20 weeks without proteinuria or organ dysfunction. Pre-

eclampsia is characterized by new-onset hypertension with proteinuria (≥300 mg/24 hours or PCR≥0.3) or organ involvement after 20 weeks, and when associated with seizures, it is termed eclampsia, a medical emergency.[4,5]

In India, hypertensive disorders of pregnancy (HDP) particularly eclampsia remain a major public health challenge. Studies from 1976 to 2014 report a wide variation in eclampsia incidence, ranging from 0.179% to 5%, with an average prevalence of about 1.5%. These differences reflect disparities in healthcare access, antenatal care utilization, and regional reporting practices.[6]

HDP are a major global public health concern, accounting for nearly 30,000 maternal deaths annually and 10-15% of maternal deaths in low- and middle-income countries. Beyond mortality, these disorders contribute to serious complications such as preterm birth, low birth weight, placental abruption, and long-term maternal and neonatal morbidity, underscoring the need for early detection and effective management.[7,8]

The Government of India launched the Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) in 2016 to ensure comprehensive antenatal care and early identification of high-risk pregnancies. Conducted on the 9th of every month, PMSMA emphasizes routine blood pressure monitoring and urine protein testing, facilitating early detection and timely management of hypertensive disorders, particularly in underserved populations.[9]

Early identification of women at risk of HDP can help reduce disease-related complications through timely intervention. Awareness regarding warning signs such as elevated blood pressure, edema, and proteinuria is essential to prevent disease progression.

In this context, the present study aims to provide insights into the proportional distribution and sociodemographic profile of hypertensive disorders of pregnancy, which may assist researchers and health program managers in planning targeted strategies to improve maternal health outcomes.

METHODS

Study design

It was a hospital-based cross-sectional study.

Study setting

The study took place at Pannadhay Zanana Hospital, RNT Medical College, Udaipur, Rajasthan, India.

Study population

Pregnant women diagnosed with hypertensive disorder admitted to Pannadhay Zanana Hospital were included.

Sample size

The sample size was calculated using the formula for cross-sectional studies $N=Z^2PQ/L^2$, where Z=1.96 at 95% confidence interval, P = expected prevalence, Q = 1–P, and L = allowable error. Based on a previous study by Nath et al, which reported a prevalence of hypertensive disorders of pregnancy of 13.9%, the minimum sample size was estimated to be 191 with a 5% absolute precision.[10] After adding a 10% non-response rate, the sample size was calculated to be 202. For better representation and analysis, a total of 210 pregnant women with hypertensive disorders of pregnancy were included in the study.

Study subjects

Study subjects were selected as per the inclusion and exclusion criteria

Inclusion criteria

Pregnant women diagnosed with hypertensive disorders of pregnancy as per standard diagnostic criteria. Pregnant women delivering at Pannadhay Zanana Hospital, RNT Medical College, Udaipur. Women who provided written informed consent to participate in the study.

Exclusion criteria

Pregnant women with major medical or surgical illnesses other than hypertension. Critically ill pregnant women unable to participate in the study were excluded from the study.

Sampling technique

A purposive sampling technique was employed for the present study. Pregnant women diagnosed with HDP and fulfilling the inclusion and exclusion criteria were intentionally selected from those delivering at Pannadhay Zanana Hospital during the study period.

Data collection

Participants were interviewed using a pre-designed, pre-tested, semi-structured questionnaire. The tool captured detailed information across multiple domains, including: labour room delivery records, PNC (postnatal care) wards.

Sociodemographic characteristics: age, residence (urban/rural), education, occupation, socioeconomic status (using modified Kuppuswamy scale).[11]

Obstetric history: parity, gravidity, trimester, history of abortion, antenatal visits, previous cesarean section. Clinical profile: type of HDP, blood pressure readings, presence of proteinuria (based on urine dipstick test), BMI was recorded.

Ethical considerations

The study was conducted after obtaining approval from the institutional ethics committee. Written informed consent was obtained. Participation was voluntary, and they had the right to withdraw at any stage. Confidentiality was maintained by anonymizing data, and all study records were securely stored under the custody of the investigator.

Study period

After IEC approval data were collected for 6 months from July 2024 to December 2024.

Data coding

The data collected was categorized according to different variables and further categorized data will be entered on a master chart created in MS Excel 2021 (Office 365, Microsoft Company Ltd., USA).

Statistical analysis

Data were coded and analysed using IBM SPSS version 25.0 (IBM Corp., Chicago, IL, USA). Descriptive statistics were computed to summarize the study variables, with frequencies and percentages used for categorical data and mean with standard deviation calculated for quantitative variables.

RESULTS

Socio-demographic characteristics of the study participants

The mean age of study participants was 27.36±5.4 years. The majority group affected by HDP were aged 28-32 years (33.8%). Most participants were Hindu (85.7%), and residence was almost equally distributed between urban (51.9%) and rural (48.1%) areas. With respect to education, primary school education was the most common (30.5%), followed by high school (26.2%). The majority of women were homemakers (67.6%), followed by those engaged in elementary occupations (14.8%) and skilled agricultural and fishery work (13.3%). Most participants belonged to the lower middle socioeconomic class (50.5%) and upper lower class (39.5%). Regarding family type, 57.14% lived in joint families, 31.0% in nuclear families, and 11.9% in extended families. In terms of body mass index, 38.6% of participants had normal BMI, while 27.14% were overweight and 24.2% were obese (Table 1).

Table 1: Socio-demographic characteristics of the study participants (n=210).

Variables	Frequency	Percentage
Age (in years)		
18-22	45	21.4
23-27	62	29.5
28-32	71	33.8
≥33	32	15.2
Religion		
Hindu	180	85.7
Muslim	13	6.2
Jain	17	8.1
Residence		
Rural	101	48.1
Urban	109	51.9
Education		
Illiterate	16	7.6
Primary school	64	30.5
Middle school	13	6.2
High school	55	26.2
Intermediate or diploma	52	24.8
Graduate	10	4.8
Occupation		
Homemaker	142	67.6
Elementary occupation	31	14.8
Plant and machine operators and assemblers	2	1.0
Skilled agricultural and fishery workers	28	13.3
Skilled worker, shop and market sales workers	2	1.0
Professional	5	2.4

Continued.

Variables	Frequency	Percentage
SES		
Upper middle (II)	17	8.1
Lower middle (III)	106	50.5
Upper lower (IV)	83	39.5
Lower (V)	4	1.9
Type of family		
Nuclear	65	31.0
Joint family	120	57.14
Extended family	25	11.9
Body mass index		
Underweight (<18.5)	21	10
Normal (18.5-22.99)	81	38.6
Overweight (23-24.99)	57	27.1
Obese (≥25)	51	24.2

Proportional distribution of hypertensive disorders of pregnancy

Among the 210 study participants with hypertensive disorders of pregnancy, gestational hypertension was the most common type, accounting for 106 cases (50.5%). This was followed by pre-eclampsia in 72 women (34.3%). Eclampsia was observed in 21 participants (10.0%), while chronic hypertension constituted the smallest proportion, with 11 cases (5.2%) (Table 2, Figure 1).

Table 2: Proportional distribution of hypertensive disorders of pregnancy (n=210).

Type of HDP	Frequency	Percentage
Chronic hypertension	11	5.2
Gestational hypertension	106	50.5
Pre-eclampsia*	72	34.3
Eclampsia	21	10.0

*Cases of chronic hypertension complicated by superimposed pre-eclampsia were included under the pre-eclampsia category for analysis.

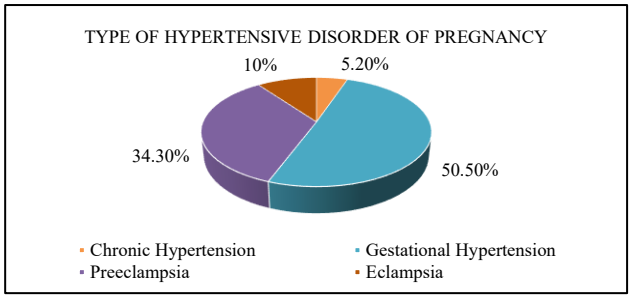

Figure 1: Proportional distribution of hypertensive disorders of pregnancy.

DISCUSSION

The present hospital-based cross-sectional study describes the proportional prevalence and sociodemographic profile of antenatal women with hypertensive disorders of pregnancy in Udaipur, India. Gestational hypertension constituted the largest proportion of cases, followed by pre-eclampsia, eclampsia, and chronic hypertension.

Majority of the respondents 71/210 (33.8%) fall within the age group 28-32 years in range, mean age of study respondents was 27.36±5.4 years. This is similar to the observation of Pandya et al which was (34.37%) and Mallick et al (40.9%).[12,13] Majority of the respondents 180/210 (85.7%) were Hindu, followed by 17/210 (8.1%) Jain, this is in contrast to study done by Nath et al where Hindus were (44.6%) and second majority of Islam (53.5%).[10]

Almost half of the respondents 109/210 (51.9%) belonged to urban area while 101/210 (48.1%) are from rural area which is in contrast of study by Bairwa et al where (30%) urban and (70%) were from rural area.[14]

Most of the respondents 64/210 (30.5%) had primary level of education, followed by high school (26.2%) while the remainder having education ranging from primary school to graduate courses, this is in contrast to the study by Nath et al in which majority of the respondents had high school level of education (38.8%).[10]

Majority of the respondents 142/210 (67.6%) were homemakers followed by (14.8%) were elementary occupation while (13.3%) were involved in skilled agricultural and fishery work, this is in contrast of the study by Nath et al in which majority (90.3%) were homemakers and (3.7%) involved in elementary occupation.[10]

Most of the respondents 106/210 (50.5%), belonged to the lower middle class (class III), followed by 83/210 (39.5%) belong to upper lower class (class IV), fewer 17/210 (8.1%) belong to upper middle (II), this is almost similar to study by Nath et al in which majority were Upper lower class (43.9%) followed by lower middle class (39.5%).[10]

Majority of the respondents 120/210 (57.14%) belonged to joint families, followed by 65/210 (31.0%) who were from nuclear families, but direct research on the impact of joint versus nuclear family structures on HDP in India is limited.

More than one-third (81/210, 38.6%) were in the normal weight category, followed by 57/210 (27.14%) was overweight. This is similar to study by Mathew et al in which (50.3%) respondents were from normal weight category.[15]

Majority of the respondents with hypertensive disorder were gestational hypertension observed in 106/210 (50.5%) followed by Preeclampsia which affected 72/210 (34.3%) of the respondents. This is similar to the observation of Sengodan et al in which majority (47.4%) had gestational hypertension followed by preeclampsia which is 32.6%.[16]

Being a hospital-based cross-sectional study, the findings may not be generalizable to the wider community, and the possibility of Berksonian bias cannot be ruled out, as more severe cases are likely to present at a tertiary care facility. The study included only pregnant women diagnosed with hypertensive disorders of pregnancy; therefore, the true prevalence of HDP in the general pregnant population could not be estimated. Information on lifestyle factors, dietary habits, physical activity, and psychosocial stress, which may influence the development of hypertensive disorders, was not assessed. Additionally, neonatal outcomes such as birth weight and prematurity were not documented, limiting assessment of perinatal impact.

CONCLUSION

The present study described the proportional distribution and sociodemographic profile of hypertensive disorders of pregnancy among antenatal women in Udaipur, India. Gestational hypertension was the most common type, followed by pre-eclampsia, eclampsia, and chronic hypertension, with most affected women belonging to the reproductive age group and lower socioeconomic strata. These findings emphasize the need to strengthen early and routine antenatal screening for hypertensive disorders, with particular focus on timely blood pressure monitoring, urine protein testing, and identification of high-risk women. Enhancing health education and strengthening existing maternal health programs may help improve early detection and management.

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