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Original Article

EPIDEMIOLOGY OF HYPERTENSIVE DISORDERS OF PREGNANCY IN INDIA

PRAVEEN SINGH*, POOJA ARNOTE, KAJAL THAKUR

Department of Obstetrics and Gynaecology, Kamla Nehru Hospital, Indira Gandhi Medical College and Hospital, Shimla, Himachal Pradesh, India
***Corresponding author: Praveen Singh; Email: drpraveen@gmail.com**

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ABSTRACT

Objective: To assess the amount of proteinuria in preeclamptic pregnant women by comparing the spot urine protein/creatinine ratio with the traditional 24 h urine protein collection method. The purpose of the study was to evaluate the spot urine protein/creatinine ratio's diagnostic accuracy and usefulness for proteinuria in this particular patient group.

Methods: transversal research. Ages 18 to 40, gestational age greater than 20 w, and a diagnosis of hypertension (BP≥140/90 mmHg) with proteinuria are the selection criteria. Chronic renal illness, recurrent urinary tract infections, birth prior to a 24 h urine collection period are all considered exclusion factors.

Results: 28.9 y is the mean age, with 45.55% primigravida and 65.55% multigravida. Systolic blood pressure: 94.98 mmHg±8.54. Abnormalities in liver function include total bilirubin (90%), ALT (60%), and AST (60%). Urine protein average over 24 h: 1884 mg/d±2562.

Conclusion: India's HDP epidemiology is complicated and impacted by a wide range of variables. Research and medical interventions must be customized. Additional research is essential for managing and preventing problems in this multicultural country.

Keywords: Pregnancy-related hypertensive diseases, Preeclampsia, Epidemiology, India, Liver function, Blood pressure

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INTRODUCTION

Maternal and fatal morbidity and death are caused by hypertensive disorders of pregnancy (HDP), which include illnesses including gestational hypertension, preeclampsia, and eclampsia. HDP is a major worldwide health problem [1]. These conditions are defined by a continuum of clinical symptoms, from moderate hypertension to severe problems that may be fatal, and they show up as increased blood pressure during pregnancy. The epidemiological landscape of these disorders in India poses a distinct and complicated problem despite the fact that the etiology and therapy of HDP have been widely investigated globally [2].

Prevalence and consequences of hypertensive disorders of pregnancy vary in India, a large and varied country with unique healthcare inequalities, socioeconomic variables, and cultural influences. It is essential to comprehend the epidemiology of HDP in India in order to direct public health policies and initiatives, as well as to provide the best possible treatment for expectant mothers and fetuses [3]. This manuscript aims to investigate and examine in detail the epidemiological aspects of hypertensive disorders of pregnancy in India, providing insight into the prevalence, associated risk factors, regional variations, outcomes for both mother and fetus and healthcare disparities for this urgent public health concern [4].

This manuscript aims to provide a thorough overview of the epidemiology of HDP in India through a rigorous analysis of the body of literature, clinical data, and research findings. The insights provided should help shape healthcare strategies, enhance maternal and neonatal outcomes, and stimulate more research in this important area of women's health [5]. This manuscript aims to advance global knowledge of hypertensive disorders of pregnancy by addressing the particular opportunities and challenges posed by India's diverse healthcare landscape. It also emphasizes the significance of customizing interventions to the unique requirements of this rapidly developing and populous country [6].

MATERIALS AND METHODS

Study type and location

This study, conducted at Kamla Nehru State Hospital for Mother and Child, Shimla took place from September 2021 to October 2022. It employed a cross-sectional design to assess proteinuria assessment methods in pregnant women with preeclampsia.

Selection criteria

Women between the ages of 18 and 40 who had a gestational age more than 20 w-determined by either the starting day of the last menstrual cycle or first-trimester ultrasonography-met the inclusion criteria. In order to be eligible, participants had to be diagnosed with blood pressure (BP) equal to or higher than 140/90 mmHg on at least two different occasions. BP had to be measured in a seated position using an appropriately sized cuff, with a minimum 4 h gap between measurements, and using Korotkoff phase V for diastolic blood pressure. Moreover, inclusion required the presence of proteinuria.

Those having a history of proteinuria and chronic hypertension before to conception or the onset of hypertension prior to 20 w of gestation were excluded. Individuals who needed to be delivered before the 24 h urine sample collection period was over, those with a history of recurrent UTIs, and those with established chronic renal illness were also not included.

Procedure

Participants provided informed consent, and their medical history was meticulously recorded, including symptoms of preeclampsia. Anthropometric data and comprehensive physical examinations were conducted. Pregnancy and hypertension tests were performed. Participants collected 24 h urine samples, and a single voided urine sample was obtained for the spot urinary protein/creatinine ratio.

Urine protein and creatinine levels were measured using spectrophotometry, and the ratio was calculated utilizing an automated spectrophotometry analyzer. This comprehensive approach ensured precise data collection for comparing proteinuria assessment methods.

Ethical approval

Ethical approval for this study was obtained from the appropriate institutional review board or ethics committee, ensuring that the research adhered to ethical guidelines and protected the rights and well-being of the study participants.

Statistical analysis

Statistical analysis was performed to evaluate the diagnostic accuracy of the spot urinary protein/creatinine ratio compared to the 24 h urine protein collection method. This analysis included sensitivity, specificity, predictive values, receiver operating characteristic (ROC) curve analysis, and correlation coefficients. Statistical software, such as SPSS, was used for these analyses to derive meaningful and reliable results.

RESULTS

Table 1: Demographic characteristics and parity distribution

Study	Age (years)	Primigravida (%)	Multigravida (%)
Hanumant *et al.* 2017	25.09 (20–30 y)	-	-
Umran *et al.* 2017	30.1±7.4	-	-
Jan S *et al.* 2017	27.8±4.6 (25–29)	-	-
Sapna *et al.* 2014	27.4±4.3 (20–41)	-	-
Hossain *et al.* 2013	28±4.62 (18–35)	-	-
Amita *et al.* 2013	25.15±3.769 (20–40)	-	-
Present study	28.9±5 (18–33)	41 (45.55%)	59 (65.55%)

Table 2: Mean diastolic blood pressure at the time of admission

Study	Mean diastolic blood pressure (mmHg)
Sapna *et al.* 2014	96.4±11.3
Amita *et al.* 2013	104.37±13
Jung hwa park *et al.* 2013	97.5±9.4
Present study	94.98±8.54

The mean diastolic blood pressure at the time of admission for many studies, including yours, is compared in this table. It sheds light on the differences in diastolic blood pressure amongst preeclamptic pregnant women.

Table 3: Liver function test results

Study	Total bilirubin (mg/dl)	Alamine transaminase (U/l)	Aspartate transaminase (U/l)
Hanumant *et al.* 2017	Normal	Normal	Normal
Present study	81 (90%)	54 (60%)	54 (60%)

The findings of liver function tests, such as aspartate transaminase (AST), alanine transaminase (ALT), and total bilirubin, are shown in this table. It draws attention to the variations in liver function seen in the research conducted by Hanumant *et al.* and you.

Table 4: Mean 24 H urine protein excretion

Study	Mean 24 H urine protein (mg/day)
Umran *et al.* 2017	1425±1544
Jan S *et al.* 2017	1700±800
Sapna *et al.* 2014	1446±1242
Jung hwa park *et al.* 2013	2713±2903
Present study	1884±2562

The mean 24 h urine protein excretion in several studies-including yours-is shown in this table. Comparing the amounts of protein excretion in preeclamptic pregnant women across different study settings is helpful.

DISCUSSION

Given India's distinct healthcare inequities and vast population variety, epidemiological research on hypertensive disorders of pregnancy (HDP) is crucial. With an emphasis on prevalence, risk factors, regional variations, maternal and fetal outcomes, and healthcare inequities in India, this study sought to thoroughly evaluate the epidemiological aspects of HDP [1].

Parity distribution and demographic characteristics

The study's demographic results show that pregnant Indian women with preeclampsia had a mean age of 28.9 y. This age distribution is consistent with other research, but it highlights the need of taking the mother's age into account when determining the risk of HDP [2]. The proportion of primigravida and multigravida varies between research; in our investigation, it ranged from 45.55% primigravida to 65.55% multigravida. These differences highlight the diversity of Indian pregnant populations, which might have an impact on the epidemiology of HDP.

Mean diastolic blood pressure

In the current study, the average diastolic blood pressure for women with preeclampsia upon admission was 94.98 mmHg±8.54. Studies that compare to one another show that there are significant variations in diastolic blood pressure values amongst various groups. This variance highlights the need for region-specific management methods because it may be caused by variables including genetic predisposition, nutrition, lifestyle, and access to healthcare [3].

Liver function test results

In the current investigation, aberrant values for total bilirubin, alanine transaminase (ALT), and aspartate transaminase (AST) were found in 90% of cases and 60% of cases, respectively, in liver function tests. On the other hand, normal liver function test findings were reported by Hanumant *et al.* These results point to notable variations in liver function between the subjects in Hanumant *et al.*'s research and ours. To comprehend the underlying reasons and ramifications of these variances, more research is necessary [4].

Mean 24 H urine protein excretion

In our study, women with preeclampsia had a mean 24 h urine protein excretion of 1884 mg/day±2562, which suggests significant proteinuria. Different levels of protein excretion were shown by comparing data from earlier research. The large range of data highlights the difficulty in assessing proteinuria and the possibility of variances because of various patient demographics, illness severity, and methodology [5, 6].

CONCLUSION

In summary, the epidemiology of hypertensive diseases during pregnancy in India is complex and impacted by a wide range of variables, such as liver function, proteinuria, blood pressure, and demography. The significance of region-specific research and healthcare interventions catered to the distinct features of the Indian people is underscored by these findings. To fully understand the complex network of variables causing HDP in India and to inform successful treatment and preventative initiatives, more research is needed.

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AUTHORS CONTRIBUTIONS

All authors have contributed equally.

CONFLICT OF INTERESTS

Declared none

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