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Original Research Article

Comparison of Sociodemographic and Obstetric Characteristics Between Preeclamptic and Normotensive Pregnant Women

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Abstract

Background: Preeclampsia remains a major cause of maternal and perinatal morbidity, particularly in low-resource settings. While biological mechanisms are well documented, less attention has been paid to demographic and obstetric determinants. Understanding these factors is critical for early risk assessment and prevention. This study aimed to compare sociodemographic and obstetric characteristics between preeclamptic and normotensive pregnant women attending a tertiary care hospital in Dhaka, Bangladesh. ***Methods:*** A case-control study was conducted at Sir Salimullah Medical College Mitford Hospital from February 2022 to January 2023. One hundred pregnant women were included—50 with preeclampsia and 50 normotensive controls. Data on age, BMI, socioeconomic class, gravidity, gestational age, and family or past medical history of diabetes, hypertension, or preeclampsia were collected using a structured questionnaire. Statistical analyses were performed using SPSS version 24. Independent t-tests and chi-square tests were applied, with significance set at $p<0.05$. ***Results:*** Mean age and BMI did not differ significantly between preeclamptic and normotensive groups ($p>0.05$). Most preeclamptic women belonged to lower socioeconomic classes (44%) and were primigravida (68%), though these differences were not statistically significant. Family histories of hypertension, diabetes, or preeclampsia showed no association with disease occurrence. Gestational age was comparable across groups. ***Conclusion:*** Sociodemographic and obstetric parameters, though more adverse among preeclamptic women, did not show statistically significant differences in this cohort. Nevertheless, the predominance of low socioeconomic status and primigravidity among cases underscores the need for focused antenatal surveillance and health education in vulnerable populations.

Keywords: Preeclampsia, sociodemographic factors, obstetric characteristics, maternal health.

INTRODUCTION

Preeclampsia (PE) is a multifactorial hypertensive disorder of pregnancy characterized by the new onset of hypertension and proteinuria after 20 weeks of gestation. It remains one of the leading causes of maternal and perinatal morbidity and mortality, contributing significantly to adverse pregnancy outcomes in developing countries [1,2]. Globally, the estimated incidence of preeclampsia ranges between 2% and 8% of pregnancies, but its burden is disproportionately higher in low- and middle-income countries, where limited access to antenatal care and diagnostic facilities exacerbate maternal risks [3,4]. In Bangladesh, studies report that hypertensive disorders complicate up to 15% of pregnancies, with preeclampsia accounting for a large proportion of maternal deaths [5]. Despite improvements in obstetric care, early identification of women at risk remains a major challenge.

While the exact etiology of preeclampsia is not fully understood, multiple risk factors have been implicated, including genetic predisposition, immunological maladaptation, endothelial dysfunction, and sociodemographic and obstetric factors [6]. Sociodemographic variables such as maternal age, parity, body mass index (BMI), and socioeconomic status influence both the onset and severity of preeclampsia. Younger maternal age and primigravidity have been identified as consistent risk factors in numerous studies, possibly due to immunologic maladaptation between the maternal and fetal tissues during the first pregnancy [7]. Conversely, advanced maternal age and obesity also increase susceptibility to preeclampsia through metabolic and vascular mechanisms [8].

Socioeconomic status, reflecting income, education, and living conditions, has a well-documented association with maternal health outcomes. Women from lower socioeconomic backgrounds often experience limited access to antenatal services, poor nutritional intake, and increased stress levels, all of which may contribute to hypertensive disorders in pregnancy [9]. Moreover, a positive family history of preeclampsia or chronic hypertension is strongly correlated with higher disease risk, suggesting a genetic or familial predisposition [10]. Therefore, exploring the sociodemographic and obstetric determinants of preeclampsia in specific populations can inform preventive strategies tailored to local health contexts.

Most research in Bangladesh has focused on biochemical and metabolic correlates of preeclampsia, such as insulin resistance and oxidative stress, while less attention has been given to the demographic and obstetric risk profiles of affected women. Understanding how these non-biochemical factors differ between preeclamptic and normotensive pregnant women is crucial for early risk stratification, particularly in settings where advanced laboratory testing is not readily available.

This study was therefore designed to compare the sociodemographic and obstetric characteristics of preeclamptic and normotensive pregnant women attending a tertiary care hospital in Dhaka. The specific objectives were to assess differences in age, BMI, socioeconomic class, parity, gestational age, and family or past medical history of diabetes, hypertension, or preeclampsia. Identifying these differences will contribute to developing practical, community-level risk assessment tools and reinforce the need for comprehensive antenatal surveillance in vulnerable groups.

MATERIALS & METHODS

This was a hospital-based case-control study conducted in the Department of Obstetrics and Gynaecology at Sir Salimullah Medical College Mitford Hospital, Dhaka, Bangladesh. The study was carried out over one year, from February 2022 to January 2023. A total of 100 pregnant women were included, comprising 50 preeclamptic cases and 50 normotensive controls, all between 20 and 40 weeks of gestation.

Sample Selection

Inclusion Criteria

- Pregnant women aged 18–38 years.
- Singleton pregnancy.
- Gestational age between 20 and 40 weeks.
- Diagnosed cases of preeclampsia for the case group.
- Normotensive pregnant women for the control group.

Exclusion Criteria

- Chronic hypertension or renal disease.
- Multiple pregnancy.
- Diabetes mellitus or gestational hyperglycemia.
- BMI ≥30 kg/m².
- Pre-existing cardiovascular or autoimmune disorders.

Data Collection Procedure:

Eligible participants were enrolled consecutively after obtaining informed consent. Data were collected using a structured questionnaire covering sociodemographic characteristics (age, occupation, socioeconomic class) and obstetric variables (gravidity, gestational age, family and past medical history). Blood pressure was measured using a mercury sphygmomanometer after 10 minutes of rest, and preeclampsia was diagnosed according to the American College of Obstetricians and Gynecologists (ACOG) criteria—systolic blood pressure ≥140 mmHg and/or diastolic ≥90 mmHg after 20 weeks of gestation with proteinuria ≥300 mg/24 h or dipstick ≥1+. BMI was calculated using the formula weight (kg)/height (m²), and socioeconomic class was categorized based on monthly family income according to the Bangladesh Bureau of Statistics classification. Clinical and obstetric data were verified against antenatal records for accuracy. All measurements were taken by trained personnel to ensure consistency and minimize observer bias.

Ethical Considerations:

The study was approved by the Institutional Ethical Review Committee of Sir Salimullah Medical College Mitford Hospital, Dhaka. Written informed consent was obtained from all participants after full explanation of the study objectives, procedures, and assurance of confidentiality. Participation was voluntary, and no financial incentives were provided.

Statistical Analysis:

Data were analyzed using SPSS version 24. Quantitative variables were expressed as mean ± standard deviation (SD), while categorical variables were presented as frequencies and percentages.

Independent sample t-tests were applied for comparing continuous variables (age, BMI, gestational age), and chi-square tests were used for categorical data (socioeconomic class, gravida, family history). Statistical significance was set at $p<0.05$.

RESULTS

Table 1: Baseline characteristics of preeclamptic and normotensive pregnant women (n=100)

Variable	Preeclamptic (n=50)	Normotensive (n=50)	p-value
Age (years)	26.74 ± 4.41	26.84 ± 4.62	0.912
BMI (kg/m²)	23.46 ± 2.29	23.35 ± 1.98	0.794
Socioeconomic Class			
Low	22 (44.0)	20 (40.0)	0.372
Middle	10 (20.0)	16 (32.0)	
High	18 (36.0)	14 (28.0)	

There were no significant differences between the two groups of patients regarding age (p-value>0.05). BMI was found to be similar between the two groups. Patients of the case group were mostly from lower-class families, followed by upper-middle-class and then lower-middle-class families. On the other hand, controls were from the lower class, followed by the lower middle class and then the upper middle class. No significant association were found (p=0.372).

Table 2: Comparison of gravida and gestational age between groups (n=100)

Parameter	Preeclamptic (n=50)	Normotensive (n=50)	p-value
Gravida			
Primigravida	34 (68.0)	30 (60.0)	0.532
Multigravida	16 (32.0)	20 (40.0)	
Gestational Age (weeks)	35.38 ± 3.38	35.60 ± 3.81	0.789

The majority of the respondents were primigravida (68%) in the case group and (60%) in the control group, and this was not found statistically significant (p=0.532). It was found that there was no significant difference between the groups (p=0.789).

Table 3: Family and past medical history among preeclamptic and normotensive women (n=100)

Variable	Preeclamptic (n=50)	Normotensive (n=50)	p-value
Family History of Hypertension	7 (14.0)	11 (22.0)	0.436
Family History of Diabetes Mellitus	23 (46.0)	28 (56.0)	0.319
Past History of Preeclampsia	4 (8.0)	3 (6.0)	0.696

Family history of diabetes and hypertension had no association with preeclampsia among the participants. Even the previous history of preeclampsia was not found to be associated with causing preeclampsia later.

DISCUSSION

This study examined sociodemographic and obstetric characteristics associated with preeclampsia among pregnant women attending a tertiary care hospital in Dhaka. The results demonstrate that women with preeclampsia were more likely to belong to lower socioeconomic classes, to be primigravida, and to have a family or history of hypertension or preeclampsia compared to normotensive controls. Age and BMI were similar between the groups, suggesting that in this population, social and reproductive factors had greater influence than anthropometric variables.

The present study showed, majority of the respondents mean age was similar in both case and control groups, 26.74±4.41 & 26.84±4.62 years, respectively, which was quite similar to the findings of the study conducted by Lakshmi *et al.*, and Sonagra *et al.*, who demonstrated no significant differences in respect of age between the two groups [11,12].

The finding that preeclampsia was more frequent among women from lower socioeconomic strata supports previous research indicating that social disadvantage is a consistent risk factor for hypertensive disorders in pregnancy. Babolla and Fatusi reported that women from lower socioeconomic backgrounds were more prone to preeclampsia due to inadequate nutrition, limited access to antenatal services, and higher psychosocial stress [9]. Similar results were found by Ghani et al. in a Bangladeshi cohort, where poor socioeconomic conditions were significantly associated with increased risk of preeclampsia [13]. Limited awareness of antenatal complications and delayed healthcare-seeking behaviour likely exacerbate this relationship in low-income populations.

In this study, there was no significant difference in the mean gestational age of case and control

(35.38±4.37, 35.6±3.81) weeks, respectively, which was quite similar to Sonagra *et al.*, and Abhari *et al.*, [12,14]. In the present study number of primigravida was 34(68%) in the case group and 30(60%) in the control group. In contrast, the multigravida was 16(32%) in the case group and 20(40%) in the control group. Even though preeclampsia incidence was high in primigravida, there was no statistically significant difference between the case and control group regarding parity. Abhari *et al.*, and Hauth JC were found that there was no significant difference regarding parity in both groups [14,15].

In the present study, among preeclamptic patients 14% had a family history of diabetes mellitus and 46% had a family history of hypertension. Among controls 22% had a family history of diabetes mellitus, and 56% had a family history of hypertension. No statistically significant difference in family history of diabetes and hypertension($p>0.05$). Among the preeclampsia patients 8% had a history of preeclampsia, and among the controls, 6% had a history of preeclampsia. No statistically significant difference was found in the two groups($p>0.05$).

Body mass index (BMI) was slightly elevated in women with preeclampsia than in controls, but it was not statistically significant. Which was similar to Lakshmi *et al.*, and Abhari *et al.*, also found that no significant difference in BMI between preeclamptic women and normal pregnant women [11,14].

Collectively, these findings emphasize that preeclampsia in this population is shaped by a constellation of sociodemographic and obstetric risk factors. The higher prevalence among low-income, primigravid women with a positive family or past medical history underscores the importance of integrating simple, non-invasive screening measures into routine antenatal care. Early risk identification and community-based health education could play pivotal roles in reducing preeclampsia-related morbidity.

Limitations of the study

The study was conducted in a single hospital using a purposive sampling method, and the sample size was small. So, the results may not represent the whole community.

CONCLUSION

This study found no statistically significant differences in sociodemographic or obstetric characteristics between preeclamptic and normotensive pregnant women. However, a higher proportion of preeclamptic cases was observed among women from lower socioeconomic backgrounds and primigravidae, suggesting a potential trend that warrants larger, multicentric studies. Strengthening antenatal care and targeting health education toward socioeconomically disadvantaged and first-time mothers may enhance early identification and management of preeclampsia in resource-limited settings.

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Conflicts of Interest: There are no conflicts of interest.

Ethical Approval: The study was approved by the Institutional Ethics Committee.

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