Original Article

Risk Factors for Preeclampsia and the Eclampsia Syndrome: Experience in a Tertiary Level Hospital

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Abstract

Background: *Preeclampsia and eclampsia syndrome are pregnancy-specific syndromes that contribute to maternal and fetal morbidity and mortality. The identification of risk factors for preeclampsia and eclampsia may allow vigilant antenatal surveillance and appropriate timing of fetal delivery to avoid serious sequel.*

Objectives: *The objective of the study was to evaluate the risk factors for pregnant women with preeclampsia and eclampsia syndrome.*

Methodology: *This cross-sectional observational study was conducted in BIRDEM General Hospital, Dhaka, from July 2019 to June 2021. The study comprised 138 clinically diagnosed preeclampsia and eclampsia syndrome. Out of 138 cases, there were 42 cases of mild preeclampsia, 62 were of severe preeclampsia, and 33 were eclampsia. Details history was provided by participants and recorded in a predesigned data collection sheet.*

Result and Observation: *In this study, the mean age of pregnant women with preeclampsia and eclampsia syndrome was 27.02±5.06 years with a highest prevalence in the lower socioeconomic class (52.2%) and illiterate (42.8%) group. Most of the patients were primigravida (63.8%). The past history of pre eclamsia/eclampsia and family history of pre eclamsia/eclampsia was also associated with the development of preeclampsia and eclampsia syndrome.*

Conclusion: *The clinical history including these information will help us to identify a group who warrant close clinical surveillance during pregnancy.*

Key Words: *Preeclampsia and eclampsia syndrome, pregnancy, risk factor.*

Introduction

Pregnancy is normal physiological event. But pregnancy itself can cause certain pathological conditions including hypertensive disorder. According to the American College of Obstetricians and Gynecologists (2013), hypertensive disorder of pregnancy includes gestational hypertension, preeclampsia and eclampsia syndrome, chronic hypertension of any etiology & pre eclampsia (PE) superimposed on chronic hypertension[1].

Preeclampsia and eclampsia syndrome are late-pregnancy symptoms that include both non convulsive and convulsive periods1. Preeclampsia is a multisystem disorder of unknown etiology characterized by the development of hypertension to the extent of 140/90 mm of Hg or more with proteinuria (more than 300 mg protein in 24 hours urine) after the 20th week in a previously normotensive and non-proteinuric woman. When complicated with generalized tonic-clonic convulsions and/or coma, preeclampsia is called eclampsia[2].

In our subcontinent, preeclampsia and eclampsia syndrome are reported to be 8-10% among pregnant women[3]. It's prevalence is still high despite the significant improvement of maternal and child care over the last decade. All over the world, it is 3rd leading cause of maternal mortality[4] and in Bangladesh, it is associated with about 20% of maternal death[5]. A survey conducted by Emergency Obstetric Care (EOC) in Bangladesh found that 5% of total obstetrical admissions in health facilities were due to preeclampsia and eclampsia syndrome[6].

There are some risk factors for preeclampsia and eclampsia syndrome. These include maternal age, race, socioeconomic situation, parity, increased BMI, high BP, past history of PE/eclampsia, etc.[7]. Association of risk factors varies with maternal demographic, socioeconomic and obstetrics parameters[8]. Considering the variation of risk factors, aim of the study was to find out risk factors of pre eclampsia and eclampsia syndrome in our population. This may help us to design a proper awareness campaign programme regarding pre eclampsia and eclampsia syndrome in our country.

Materials and Methods

This cross-sectional observational study was performed over a period of 2 years from July 2019 to June 2021 in BIRDEM General Hospital, Shahbagh, and Dhaka. The study comprised 138 clinically diagnosed cases of pregnant women with preeclampsia and eclampsia syndrome by the inclusion and exclusion criteria. The pregnant women who had blood pressure at or above 140/90 mmHg on at least two occasions 6 hours apart after 20 weeks of gestation, with or without edema, proteinuria and convulsion were included in this study. These cases are further divided as mild preeclampsia when blood pressure is at least 140/90 mm of Hg on two occasions at 6 hours apart associated with proteinuria. Severe cases are defined as one or more criteria of the following: blood pressure of at 160/110 mm of Hg at least on two occasions at 6 hours apart with proteinuria, with oliguria (<500ml/24hours) or cerebral/visual disturbances or pulmonary edema or any other features of end-organ damage. Preeclampsia becomes eclampsia as it becomes complicated by convulsions and/or coma. Among all the cases, relevant history with attention to its risk factors including age, gravida, other clinical information (anaemia, BP, oedema, H/O previous childbirth, past illness), were taken. All information were recorded systematically in data sheet & the statistical analysis was carried out using the Statistical Package for Social Sciences version 20.0 for Windows (SPSS Inc., Chicago, Illinois, USA). P-value<0.005 was considered as significant. Ethical practice was ensured in every step of the study.

Results

In this study, out of 138 cases, there were 30.4% (42 cases) of mild preeclampsia (mild PE), 45.7% (63cases) were of severe preeclampsia (severe PE), and 23.9% (33 cases) were of eclampsia.

In the present study, the mean age of the study population was 27.69±4.62 years, 27.81±5.61 years, and 24.67±4.85 years in mild PE, severe PE, and eclampsia, respectively. Eclampsia was found in a relatively younger age group of the patient than mild to severe PE. It was observed that age group was statistically significant among three groups (Table I).

Table I: Distribution of the study population according to the age groups (n=138)

Data were expressed as frequency and percentage and Mean±SD

Age groups (years)	Mild PE (n=42)	Severe PE (n=63)	Eclampsia (n=33)	p-value
<20	5(11.9%)	8(12.7%)	10(30.3%)	
21-30	30(71.4%)	42(66.7%)	20(60.6%)	0.008^s
31-40	7(16.7%)	13(20.6%)	3(9.1%)	
Mean±SD	27.69±4.62	27.81±5.16	24.67±4.85	

ANOVA test was performed. s=significant.

In terms of occupation, housewives were most common in all three groups (83.3%, 90.5%, and 100% respectively). Occupational status was not significant among three groups (Table II).

Table II: Distribution of the study population according to the occupation (n=138)

Occupation	Mild PE (n=42)	Severe PE (n=63)	Eclampsia (n=33)	p-value
Housewife	35(83.3%)	57(90.5%)	33(100.0%)	0.050^{ns}
Service holder	7(16.7%)	6(9.5%)	0(0.0%)	

Chi-square test was used, ns= not significant

More than half of the study population in severe PE (60.3%) and eclampsia (78.8%) group belonged to the lower socioeconomic class. It was observed that socioeconomic status was statistically significant among three groups (Table III).

Table III: Distribution of the study population according to the socioeconomic status (n=138)

Socioeconomic Status*	Mild PE (n=42)	Severe PE (n=63)	Eclampsia (n=33)	p-value
Upper Class (monthly incomeBDT>83,018tk)	4(9.5%)	2(3.2%)	1(3.0%)	<0.001^s
Upper Middle Class (monthlyincomeBDT26,852-83,018 tk)	12(28.6%)	7(11.1%)	0(0.0%)	
Lower Middle Class (monthlyincomeBDT6828.0-26852tk)	18(42.9%)	16(25.4%)	6(18.2%)	
Lower Class (monthlyincomeBDT≤6827tk)	8(19.0%)	38(60.3%)	26(78.8%)	

*Source: NMDS April 2011(National Minimum Data Set survey, Bangladesh)

Chi-square test was used, s= significant

Lack of education was more frequent in the severe PE (47.6%) and eclampsia (78.8%) group. It was observed that level of education was statistically significant among three groups (Table IV).

Table IV: Distribution of the study population according to the education level (n=138)

Education level	Mild PE (n=42)	Severe PE (n=63)	Eclampsia (n=33)	p-value
Illiterate	3(7.1%)	30(47.6%)	26(78.8%)	
Primary	6(14.3%)	11(17.5%)	2(6.1%)	
SSC	5(11.9%)	6(9.5%)	2(6.1%)	$<0.001^s$
HSC	12(28.6%)	7(11.1%)	2(6.1%)	
Graduate	16(38.1%)	9(14.3%)	1(3.0%)	

Chi-square test was used, s= significant

Regarding gravida, most of the patients were primigravida in the severe preeclamptic 57.1% (36 cases) and eclamptic 81.8% (27 cases) group. This parameter is not statistically significant among three groups (Table V).

Table V: Distribution of the study population according to the obstetric variables (n=138)

Obstetric variables	Mild PE (n=42)	Severe PE (n=63)	Eclampsia (n=33)	p-value
Gravida				
Primi	25(59.5 %)	36(57.1%)	27(81.8%)	
Multi	17(40.5%)	27(42.9%)	6(18.2%)	0.425^{ns}

The figure within parentheses indicated in percentage.

On the other hand, 38.1% (16 cases) of mild PE and 42.9% (27 cases) of severe PE gave the history of past preeclampsia or eclampsia in previous pregnancy as opposed to 27.3% (9 cases) of eclampsia. Family history was found chiefly in mild PE 59.5% (25 cases) and eclampsia 66.7% (22 cases) in comparison to severe PE for 46.0% (29 cases). Value obtained from this table are not statistically significant among three groups (Table VI).

Table VI: Distribution of the study population according to the past history of PE/Eclampsia and family history of PE/Eclampsia (n=138)

Variables	Mild PE (n=42)	Severe PE (n=63)	Eclampsia (n=33)	p-value
Past History of PE/Eclampsia				
Present	16(38.1%)	27(42.9%)	9(27.3%)	
Absent	26(61.9%)	36(57.1%)	24(72.7%)	0.326^{ns}
Family history of PE/Eclampsia				
Present	25(59.5%)	29(46.0%)	22(66.7%)	
Absent	17(40.5%)	34(54.0%)	11(33.3%)	0.122^{ns}

The figure within parentheses indicated in percentage.

Chi-squared Test (2) was done to analyze the data, s= significant, ns= not significant.

Discussion

In this study, the mean age of mild PE & severe PE was 27.69±4.62 years and 27.81±5.61 years, respectively. In contrast eclampsia was more in younger age group showed mean age of PE/eclampsia was 24.06±3.71 years. A similar finding was also described by Jahan et al.[6]. As eclampsia is a more severe stage of PE, this apparent discrepancy could indicate increased lability of the central nervous system response in teenage mothers[9].

In terms of occupation, housewives were most common in all three groups (83.3%, 90.5%, and 100% respectively). This data was similar to the studies of Yeasmin and Uddin[5] (80%) and Bej et al.[10] (91.8%). In our country, the reason behind that is they remain more stressed due to their household work and are not concern about prenatal care[5].

In the current study, Lack of education was more frequent in the severe PE (47.6%) and eclampsia (78.8%) group. Yeasmin and Uddin[5] reported about educational status (primary level) that was 60% in PE and eclampsia cases. On the other hand, Bej et al.[10] revealed educational status (higher secondary level) 48.4% in PE and eclampsia cases.

More than half of the study population in severe PE (60.3%) and eclampsia (78.8%) group belonged to the lower socioeconomic class. Similar findings were also observed in the other studies done by Yasmin and Uddin[5]. They found that 52% cases of PE and eclampsia occurred in the lower socioeconomic group. The pregnant women of the lower socioeconomic groups of our country did not receive proper antenatal care due to a lack of knowledge and self awareness[5].

Most of the patients were primigravida in the severe preeclamptic 57.1% (36 cases) and eclamptic 81.8% (27 cases).This data was more or less similar to the other studies performed in Bangladesh that were 62% to 76% cases (Yeasmin and Uddin[5] & Sultana et al.,[11]). On the contrary, Mousa and Joborae[12] in Iraq found 65% of hypertensive women were multigravid.

On the other hand, 38.1% (16 cases) of mild PE and 42.9% (27 cases) of severe PE gave the history of past preeclampsia or eclampsia in previous pregnancy as opposed to 27.3% (9 cases) of eclampsia. The data was almost similar to other studies performed in Bangladesh (38%)[5] .

Family history (mother, sister, grandmother) was found chiefly in mild PE for 59.5% (25 cases) and eclampsia for 66.7% (22 cases) in comparison to severe PE for 46.0% (29 cases) The finding was similar to the studies performed by Yeasmin and Uddin[5] & Parmer et al.[13].

Conclusion

Poor socioeconomic condition and illiteracy significantly play a role in development of preeclampsia and eclampsia syndrome. Eclampsia is also related to young maternal age. Proper education of girls and preventing childhood marriage may help to reduce the burden of this disease. This study along with other studies in future may assist us to design proper awareness campaign programme to prevent preeclampsia and eclampsia. This will aid to reduce maternal mortality and morbidity.

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