Thai Journal of Obstetrics and Gynaecology
March 1998, Vol.10, pp. 21-26

OBSTETRICS

Factors Associated with Preeclampsia in Pregnant Women Admitted at Ramathibodi Hospital, 1994-1995

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ABSTRACT

Objective To study number of women whose blood pressure after admission became normal with no proteinuria. Demographic characteristic and factors which may be associated with preeclampsia were also studied. And to establish whether these factors are different for mild preeclampsia and severe preeclampsia.

Design Analytical study.

Setting Department of Obstetric and Gynaecology, Faculty of Medicine, Ramathibodi Hospital.

Subjects 488 pregnant women admitted to the antenatal ward with diagnosis of preeclampsia were recruited into this study. Factors associated with preeclampsia were studied between 84 women whose blood pressure after admission became normal and 237 preeclamptic women. In addition, factors associated with severe preeclampsia were studied between 176 mild preeclamptic women and 61 severe preeclamptic women.

Main variables examined Medical records were abstracted for information regarding maternal age, marital status, body mass index at first prenatal visit, average weight gain, gravidity, previous history of pregnancy-induced hypertension, diabetes mellitus, average mean arterial pressure, hematocrit.

Results Of the 488 pregnant women studied 84 (17.21%) became normotensive after admission. The rate of hypertensive disorders in pregnancy was 2.69% per total deliveries ; 1.17% mild preeclampsia, 0.39% severe preeclampsia, 0.01%

eclampsia, 0.22% chronic hypertension, 0.32% chronic hypertension with superimposed pregnancy-induced hypertension and 0.57% transient hypertension. By multiple logistic regression, there was no factors associated with preeclampsia. The only risk factor associated with severe preeclampsia was body mass index of greater than or equal to 21 kg/m^2 was found to be a protective factor against severe preeclampsia.

Conclusion The result of this study could be used for planning the appropriate care for women with hypertensive disorder in pregnancy. Closed observation should be done in pregnant women with mild pre-eclampsia who have body mass index at first prenatal visit less than 21 kg/m^2.

Key words : preeclampsia, eclampsia, pregnancy-induced hypertension, hypertensive disorders in pregnancy, risk factors

Preeclampsia is a major contributor to maternal morbidity and mortality.[1] In addition, it is a major cause of preterm delivery, intrauterine growth restriction and perinatal mortality.[2] It is continues to be one of leading causes of maternal death in Thailand.[3] Though, early detection and appropriate treatment may prolong pregnancy long enough to ensure a satisfactory outcome for both mother and fetus. Also, excluding young nulliparas, some women without proteinuria and with blood pressure less than 140/90 mmHg may be managed at home. Such management may continue as long as the disease does not worsen and if intrauterine growth restriction is not suspected.[1] At the Ramathibodi Hospital, which admits pregnant women who received the diagnosis of preeclampsia to the antenatal ward. There were some pregnant women whose blood pressure after admission became normal with no proteinuria. The present study sough to identify factors associated with preeclampsia and to determine whether these factors are similar in mild preeclampsia and severe preeclampsia. This information is expected to facilitate identification of pregnant women at risk for admission, therefor, the admission will benefit everybody not only pregnant women but also personnel and management of hospitalization.

Materials and Methods

This was analytical study and carried out at Department of Obstetrics and Gynecology, Ramathibodi Hospital between January 1,1994 to December 31, 1995. All pregnant women admitted to the antenatal ward with the diagnosis of preeclampsia were recruited into this study. Women who were not delivered at Ramathibodi Hospital or referred from others hospital were excluded.

Data from medical records were extracted and diagnosis were carefully checked. The definitions of hypertensive disorders in pregnancy were those adopted by the Committee on Terminology of the American College of Obstetricians and Gynecologis.[4] Hypertension : Systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg on more than one occasion. Mild preeclampsia : Hypertension combined with proteinuria and edema, excluding severe preeclampsia. Severe preeclampsia : Systolic blood pressure ≥ 160 mmHg or diastolic blood pressure ≥ 110 mmHg on at least two occasions separated

by 6 hours apart and with the patient at bed rest, or proteinuria ≥ 5 g/24 hours, or urinary out put ≤ 400 ml/24 hours, or cerebral or visual disturbances, or pulmonary edema or cyanosis.

The doctors' analyses included number of women whose blood pressure after admission became normal with no proteinuria. Demographic characteristic and factors which may be associated with preeclampsia were also studied. And divided women who admitted to the antenatal ward with the diagnosis of preeclampsia into two groups ; Women whose blood pressure after admission became normal with no proteinuria and women whose blood pressure after admission still ≥ 140/90 mmHg with proteinuria. Not only that studied factors associated with preeclampsia, but also studied factors associated with severe preeclampsia between women who received a diagnoisis of mild preeclampsia and severe preeclampsia. The following baseline factors were evaluated : age ; marital status ; body mass index at first prenatal visit ; average weight gain ; gravidity ; previous history of pregnancy-induced hypertension ; diabetes mellitus ; average mean arterial pressure ; hematocrit. Women who received a diagnosis of chronic hypertension, chronic hypertension with superimposed pregnancy-induced hypertension, transient hypertension were excluded. Statistics analysis was carried out using percentage, mean, standard deviation for descriptive analysis, adjusted odds ratios and 95% confident interval and multiple logistic regression.

Results

Of the 488 pregnant women studied, 84 (17.21%) became normotensive after admission. The rate of hypertensive disorder in pregnancy was 2.69% per total deliveries ; 1.17% mild preeclampsia, 0.39% severe preeclampsia, 0.01% eclampsia, 0.22% chronic hypertension, 0.32% chronic hypertension with superimposed pregnancy-induced hyper-tension and 0.57% transient hypertension (Table 1). The age of the women were between 30-40 years old. The majority were

Table 1. Number of cases and rates per total deliveries for women with Hypertensive Disorders in Pregnancy, by classification

Hypertensive Disorders in Pregnancy	2537	2538	Total	Rate (%)
Mild preeclampsia	89	87	176	1.17
Severe preeclampsia	24	35	59	0.39
Eclampsia	1	1	2	0.01
Chronic hypertension	17	16	33	0.22
Chronic hypertension with superimposed PIH	28	20	48	0.32
Transient hypertension	42	44	86	0.57
Total deliveries	7,434	7,591	15,025	

PIH = pregnancy-induced hypertension

Table 2. Risk factors for preeclampsia : Adjusted odds ratios by Multiple logistic regression

Variables	OR	95% CI
Age	1.07	0.62 - 1.84
Marital status	0.72	0.43 - 1.22
Body mass index at first prenatal visit	0.96	0.48 - 1.89
Average weight gain	0.81	0.43 - 1.51
Gravidity	0.83	0.43 - 1.60
Previous history of PIH	2.39	0.29 - 19.80
Diabetes mellitus	6.51	0.85 - 50.05
Average mean arterial pressure	2.64	0.89 - 7.88
Hematocrit	1.53	0.17 - 13.71

Table 3. Risk factors for severe preeclampsia : Adjusted odds ratios by Multiple logistic regression

Variables	OR	95% CI
Age	1.03	0.69 - 2.44
Marital status	1.44	0.77 - 2.70
Body mass index at first prenatal visit*	0.37	0.17 - 0.79
Average weight gain	0.90	0.44 - 1.85
Gravidity	1.04	0.88 - 1.23
Previous history of PIH	1.08	0.20 - 5.66
Diabetes mellitus	0.17	0.02 - 1.32
Average mean arterial pressure	0.45	0.09 - 2.15
Hematocrit	1.63	0.24 -10.98

*significant

married. Fifty five percent had body mass index at first prenatal visit greater than or equal to 37 kg/m^2, forty-six percent had average weight gain greater than or equal to 0.38 kg/week. Considering multigravida, the majority of women had not had previous history of pregnancy-induced hypertension. The majority of women had no diabetes mellitus. The average mean arterial pressure was greater than or equal to 85 mm.Hg and hematocrit was greater than or equal to 30%.

There was no factors associated with preeclampsia (Table 2). The only risk factor associated with severe preeclampsia was body mass index at first prenatal visit (adjusted OR = 0.37, 95% CI = 0.17-0.79). The body mass index of greater than or equal to 21 kg/m^2 was found to be a protective factor against severe preeclampsia (Table 3).

Discussion

From this study, there was no factor associated with preeclampsia in pregnant women admitted at Ramathibodi Hospital. The only risk factor associated with severe preeclampsia was body mass index at first prenatal visit. The body mass index of greater than or equal to 21 kg/m^2 was found to be a protective factor against severe preeclampsia. Like Pichainarong,[5] measurement variables in this study were less than for medium frame people in the West. Because subjects in this study were smaller, measurement variables could be used with Eastern small body size. Hall and Campbell[6] suggested that the study of weight gain during pregnancy was complicated because the investigaters might not specify the time period when the weight gain occurred, and weight gain occurring late in pregnancy could not predict pregnancy-induced hypertension of early on set. In this study circumvented these problems by analysing body mass index at first prenatal visit and for the same reasons an average mean arterial pressure was used in place of mean arterial pressure in each trimester (eventhough, pregnancy-induced hypertension frequently occurs at greater than or equal to 20 weeks of gestational age) which differs from many previous studies. Although Chesley[7] suggested that severe obesity was associated with pregnancy-induced hypertension because of the confounding presence of chronic hypertension, this study excluding subjects with chronic hypertension. However, the finding of this study is inconsistent with the conclusion of Pichainarong.[5] The difference between this study and Pichainarong might, of course, be due to study design and samples selection. In addition, age, marital status, gravidity, previous history of pregnancy-induced hypertension, diabetes mellitus and hematocrit were not found to be associated with either preeclampsia or severe preeclampsia. This finding are inconsistent with the conclusion of others.[5,8-13]

The result of this study could be used for planning the appropriate care for women with hypertensive disorders in pregnancy. Closed observation should be done in pregnant women with mild preeclampsia who have body mass index at first prenatal visit less than 21 kg/m.^{2} Anyway, to apply the result in this study should consider samples selection and also study design.

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