วารสารแพทย์เขต ๔-๕ ปีที่ ๒๙ ฉบับที่ 1 ม.ค. - มี.ค. ๒๕๕๓ Reg 4-5 Med J Vol. 29 No. 1 January - March 2010

นิพนธ์ต้นฉบับ **Original Article**

Severe Preeclampsia in Nakhonpathom Hospital

ภาวะครรภ์เป็นพิษระดับรุนแรงในโรงพยาบาลนครปฐม

วีระเดช เฉลิมพลประภา พ.บ.,
ว.ว. สูติศาสตร์-นรีเวชวิทยา
กลุ่มงานสูติ-นรีเวชกรรม
โรงพยาบาลนครปฐม

Veeradej Chalermpolprapa M.D.,
Thai Board of Obstetrics and Gynecology
Division of Obstetrics and Gynecology
Nakhonpathom Hospital

ABSTRACT

Objectives : To determine the incidence rate, clinical characteristics, frequency of abnormal findings, risk factors, mode of delivery, fetal outcomes and obstetric complications.

Materials and methods : A retrospective study was used to compare the severe preeclampsia group to the control group who had delivered at Nakhonpathom hospital during October 1, 2008 - September 30, 2009.

Results : The incidence rate of severe preeclampsia was 2.18 percent. Eclampsia occurred in 5 pregnant women. The most common abnormal findings were severe hypertension, proteinuria and cerebral/visual disturbance. The risk factors were age ≤ 19 years, twins and BMI before pregnancy > 35 kg/m^2. The most common mode of delivery was cesarean section. The obstetric complications such as PPH and abruptio placenta were not more than the control group. However the fetal outcomes such as birth weght < 2,500 grams, stillbirth, early neonatal death, birth asphyxia and hydrops fetalis were more than the control group.

Conclusion : Knowing about risk factors for severe preeclampsia is useful for monitoring the preeclampsia patients effectively. The benefit is early detection and treatment. It helps reduce the serious complications in mothers and infants.

Keywords : severe preeclampsia

บทคัดย่อ

วัตถุประสงค์ : เพื่อศึกษา อุบัติการณ์ ลักษณะทางคลินิก ความถี่ของความผิดปกติ ปัจจัยเสี่ยง วิธีการคลอด

ผลลัพธ์ของทารก และภาวะแทรกซ้อนทางสูติกรรม

วัสดุและวิธีการศึกษา : ศึกษาวิจัยเชิงวิเคราะห์ย้อนหลัง เปรียบเทียบหญิงตั้งครรภ์ที่มีภาวะครรภ์เป็นพิษระดับรุนแรงและกลุ่มควบคุมที่มาคลอดที่โรงพยาบาลนครปฐม ระหว่างวันที่ 1 ตุลาคม 2551 จนถึง 30 กันยายน 2552

ผลการศึกษา : อุบัติการณ์ของภาวะครรภ์เป็นพิษระดับรุนแรงเท่ากับร้อยละ 2.18 ชักรุนแรง 5 คน ความผิดปกติที่พบส่วนใหญ่ได้แก่ ความดันโลหิตสูง ไข่ขาวในปัสสาวะ และอาการปวดศีรษะตาพร่ามัว ปัจจัยเสี่ยงได้แก่ อายุ ≤ 19 ปี ครรภ์แฝดและ BMI ก่อนตั้งครรภ์ > 35 กก./ม.^{2} วิธีการคลอดในกลุ่มนี้ส่วนใหญ่คือ การผ่าตัดคลอดทางหน้าท้อง ภาวะแทรกซ้อนทางสูติกรรมเช่น PPH และ abruptio placenta ไม่แตกต่างจากกลุ่มควบคุม สำหรับผลลัพธ์ของทารก จะมีน้ำหนักแรกคลอด < 2,500 กรัม ตายคลอด ตายภายใน 7 วันหลังคลอด ทารกแรกคลอดขาดออกซิเจน และ hydrops fetalis มากกว่ากลุ่มควบคุม

สรุป : การรู้ปัจจัยเสี่ยงของภาวะครรภ์เป็นพิษระดับรุนแรง จะช่วยให้มีการติดตามและเฝ้าระวังภาวะครรภ์เป็นพิษระดับรุนแรงได้รวดเร็วและมีประสิทธิภาพมากขึ้น ช่วยให้การวินิจฉัยและรักษาทำได้รวดเร็ว และจะสามารถลดผลแทรกซ้อนที่รุนแรงต่อหญิงตั้งครรภ์และทารกลงได้

คำสำคัญ : ครรภ์เป็นพิษระดับรุนแรง

Introduction

Severe preeclampsia is one of the major causes of maternal morbidity and mortality. Convulsion or cerebral hemorrhage may occur in severe cases and threaten to life. In addition, the perinatal mortality rate is also high due to preterm birth, birth asphyxia from uteroplacental insufficiency and intrauterine growth retardation. The incidence rate is usually about 5 percent of delivery. This figure is different in each report. In Thailand, the incidence rate of preeclampsia is 4 percent of pregnant women who had delivered at Siriraj Hospital and 5-8 percent of pregnant women who had delivered at Chulalongkorn hospital.

The study of severe preeclampsia in various aspects such as incidence rate, risk factors, signs and symptoms and other abnormal findings, mode of delivery, maternal and fetal complications, indicates the scope and severity of the problems. In addition, it is also used to evaluate caring during pregnancy and childbirth. The data from the study is also used to improve care for pregnant women with severe preeclampsia and to prevent and reduce serious complications that may occur to pregnant women and infants.

Materials and methods

This study was the retrospective study, collecting information from pregnant women who had delivered in the delivery room, Nakhonpathom hospital during October 1, 2008 - September 30, 2009. The pregnant women were divided into 2 groups as follows.

1. **The study group** was the pregnant women who were diagnosed with severe preeclampsia according to diagnostic criteria below.

Criteria for diagnosis severe preeclampsia

Abnormal findings	mild	severe
Systolic blood pressure	< 160 mm Hg	160 mm Hg or higher
Diastolic blood pressure	< 110 mm Hg	110 mm Hg or higher
Proteinuria	Trace to 1+	Persistent 2+ or more
Headache	Absent	Present
Visual disturbance	Absent	Present
Upper abdominal pain	Absent	Present
Oliguria	Absent	Present
Convulsion (eclampsia)	Absent	Present
Serum creatinine	Normal	Elevated
Thrombocytopenia	Absent	Present
Liver enzyme elevation	Minimal	Marked
Fetal growth restriction	Absent	Obvious
Pulmonary edema	Absent	Present

During the period of study, 108 pregnant women were diagnosed with severe preeclampsia.

2. The control group was the pregnant women who were not diagnosed with mild and severe preeclampsia. In addition, the pregnant women with some medical complications such as chronic hypertension, diabetes mellitus, nephrotic syndrome, systemic lupus erythematosus and thyrotoxicosis were excluded from the study.

During the period of study, 4,952 pregnant women delivered in the delivery room, Nakhonpathom hospital. However, only 4,601 pregnant women were included in this group.

The objectives of this study were

1. Incidence rate of severe preeclampsia.
2. Clinical characteristics of study population such as age, gravida, gestational age and birth weight.
3. Frequency and percentage of abnormal findings in pregnant women who were diagnosed with severe preeclampsia.
4. Comparison of risk factors for severe preeclampsia, mode of delivery, fetal outcomes and obstetric complications between two groups.

The data was analyzed by using independent - samples T test, relative risk, 95% confidence interval from SPSS 15.0 for windows and OpenEpi version 2.3.

Results

During October 1, 2008-September 30, 2009, there were 108 pregnant women from all 4,952 pregnant women being diagnosed with severe preeclampsia. The incidence rate was 2.18 percent. The most common abnormal finding was severe hypertension. In addition, the other abnormal findings were proteinuria, cerebral/visual disturbance, epigastric pain, impaired liver function, oliguria, IUGR, pulmonary edema and platelets < 100,000/μl. respectively, as shown in Table 1.

Comparison of age, gestational age and birth weight showed significant difference statistically between two groups. However, only gravida showed no significant difference statistically between two groups, as shown in Table 2.

Comparison of risk factors such as teenage pregnancy, twins and BMI before pregnancy > 35 kg/m^2 showed significant difference statistically between two groups. However, maternal age > 35 years, primigravida and history of hypertension in previous pregnancy showed no significant difference statistically between two groups, as shown in Table 3.

Comparison of mode of delivery showed that the pregnant women with severe preeclampsia delivered by cesarean section more than the control group and delivered by normal labour less than the control group statistically significant. However, the other obstetric procedures showed no significant difference statistically between two groups, as shown in Table 4.

Comparison of fetal outcomes showed that

Table 1 Frequency and percentage of abnormal findings in severe preeclampsia

Abnormal findings	Frequency (percentage) n = 108
- systolic blood pressure ≥ 160 mmHg and/or diastolic blood pressure ≥ 110 mmHg	108 (100%)
- mean systolic blood pressure (mmHg)	163.82 ± 25.007
- mean diastolic blood pressure (mmHg)	110.83 ± 14.670
- proteinuria (%)	42 (38.89%)
- cerebral/visual disturbance (%)	31 (28.70%)
- epigastric pain (%)	10 (9.26%)
- impaired liver function (%)	8 (7.41%)
- oliguria (%)	2 (1.85%)
- IUGR (%)	2 (1.85%)
- pulmonary edema (%)	1 (0.93%)
- platelets < 100,000/μl. (%)	1 (0.93%)

Table 2 Comparison of age, gravida, gestational age and birth weight between the severe preeclampsia group and the control group

DATA	Severe preeclampsia n = 108	Control n = 4,601	p-value
age	26.03 ± 7.208	26.19 ± 6.427	p = .034
gravida	2.74 ± .921	2.87 ± .975	p = .858
gestational age	35.99 ± 4.4195	38.14 ± 2.251	p = .000
birth weight	2,595.97 ± 904.922	3,029.86 ± 500.159	p = .000

Table 3 Comparison of risk factors between the severe preeclampsia group and the control group

Risk factors	Severe preeclampsia n = 108	Control n = 4,601	RR&CI
age > 35 years	13 (12.04%)	413 (8.98%)	1.34 (0.80-2.25)
age ≤ 19 years	27 (25.0%)	779 (16.93%)	1.48 (1.06-2.06)*
Primigravida	56 (51.85%)	1998 (43.42%)	1.2 (0.99-1.44)
Twins	4 (3.70%)	47 (1.02%)	3.63 (1.33-9.88)*
History of hypertension	3 (2.78%)	41 (0.89%)	3.12 (0.98-9.91)
BMI before pregnancy > 35 kg/m^2	9 (8.33%)	156 (3.39%)	2.46 (1.29-4.68)*

* Indicates difference is statistically significant ($p < .05$).

Table 4 Comparison of mode of delivery between the severe preeclampsia group and the control group

Mode of delivery	Severe preeclampsia n = 112	Control n = 4,648	RR & CI
N/L	37 (33.03%)	2,816 (60.59%)	0.55 (0.42- 0.71)*
V/E or F/E or B/A	2 (1.79%)	139 (2.99%)	0.59 (0.15-2.38)
C/S	73 (65.18%)	1,693 (36.42%)	1.79 (1.56- 2.06)*
- primary	63 (56.25%)	1,143 (24.59%)	2.29 (1.93-2.71)*
- repeated	10 (8.93%)	550 (11.83%)	0.75 (0.42-1.37)

* Indicates difference is statistically significant ($p < .05$).

the pregnant women with severe preeclampsia had more low birth weight, stillbirth, early neonatal death, birth asphyxia and hydrops fetalis than the control group statistically significant, as shown in Table 5.

Comparison of obstetric complications such as postpartum hemorrhage and abruptio placenta showed no significant difference statistically between two groups, as shown in Table 6.

Dicussion

Severe preeclampsia is one of the major obstetric problems affecting both pregnant women and infants.[1-3] There were 4,952 pregnant women de-

Table 5 Comparison of fetal outcomes between the severe preeclampsia group and the control group

Fetus	Severe preeclampsia n = 112	Control n = 4,648	RR & CI
Birth weight < 2,500 grams	40 (35.71%)	481 (10.35%)	3.45 (2.65-4.49)*
stillbirth	3 (2.68%)	28 (0.60%)	4.45 (1.37-14.41)*
Early neonatal death	4 (3.57%)	13 (0.28%)	12.77 (4.23-38.55)*
birth asphyxia			
- apgar score 1-3	4 (3.57%)	15 (0.32%)	11.07 (3.73-32.81)*
- apgar score 4-7	11 (9.82%)	112 (2.41%)	4.08 (2.26-7.35)*
hydrops fetalis	1 (0.89%)	3 (0.06%)	13.83 (1.45-131.9)*

* Indicates difference is statistically significant ($p < .05$).

Table 6 Comparison of obstetric complications between the severe preeclampsia group and the control group

Obstetric complications	Severe preeclampsia n = 108	Control n = 4,601	RR & CI
PPH	2 (1.85%)	37 (0.80%)	2.30 (0.56-9.43)
eclampsia	5 (4.63%)	0 (0%)	
abruption placenta	1 (0.93%)	9 (0.19%)	4.73 (0.61-37.03)

livered at Nakhonpathom hospital in the last fiscal year. 219 of those were diagnosed with preeclampsia, representing 4.42 percent. Only 108 pregnant women were diagnosed with severe preeclampsia, representing 2.18 percent. Thus, it is the major issue and the important cause of maternal-fetal morbidity and mortalit.

Due to causes of the disease are unknown,[1] it currently does not have any methods to prevent the disease. Early detection, finding the disease when the disease is not severe and early management are the best methods to prevent from develping the serious complications and reduce the risk to mothers and infants.

Severe preeclampsia is one of the serious maternal complications of hydrops fetalis[4-5] and termination of pregnancy is considered . The methods to find the couples at risk of hydrops fetalis early were by blood sampling for thalassemia screening as well as ultrasound screening.

The pregnant women who have risk for severe preeclampsia will be followed up, monitored frequently for early detection and management before developing to severe preeclampsia. In addition, the pregnant women with mild preeclampsia were terminated of pregnancy at a gestational age of 37 weeks or more when the cervix is ripe to reduce incidence rate of severe preeclampsia.[1,6-7] However, some pregnant women developing severe preeclampsia were referred from community hospitals. Knowing any risk factors can help anticipate who is at risk for this condition, so distribution of knowledge to community hospitals and the other medical staffs is valued. All of the methods above can reduce serious complications of severe preeclampsia.

This study found that teenage pregnancy,[2,8] twins [9-10] and BMI before pregnancy > 35 kg/m^2 [2,10-11] were risk factors for severe preeclampsia, 1.48 (1.06-2.06), 3.63 (1.33-9.88), 2.46 (1.29-4.68), respectively. However, history of hypertension in previous pregnancy [10,12] was found to cause a risk 3.12 times but showed no significant statistically 3.12 (0.98-9.91). Primigravida[8,10-11] also showed no significant difference statistically between two groups 1.2 (0.99-1.44).

The common abnormal findings in severe preeclampsia group[3,13] were severe hypertension, proteinuria and cerebral/visual disturbance. However, the serious complications such as pulmonary edema and low platelets (< 100,000 /μl.) were found in small number of patients.

Due to the need for termination of pregnancy in severe preeclampsia group, the opportunity to cesarean section increased clearly and significant statistically because of low bishop 's score.[14,15] In addition, the fetal outcomes such as low birth weight, stillbirth, early neonatal death and birth asphyxia were more than the control group significant statistically.[3,12-13,16] The most likely cause was preterm delivery.

Conclusion

Knowing about risk factors for severe preeclampsia, such as teenage pregnancy, twins, BMI before pregnancy > 35 kg/m^2 and history of hypertension in previous pregnancy is useful for monitoring the preeclampsia patients effectively. It's benefit is early detection and treatment. It also helps reduce

the serious complications in mothers and infants.

Distribution of knowledge to community hospitals and the other medical staffs especially in antenatal care unit is useful for early detection pregnant women who have risk factor for severe preeclampsia in rural area and referring the patients rapidly as the condition is not severe.

References

1. Cunningham FG, Leveno KJ, Bloom SL, Hauth JC, Gilstrap III L, Wenstrom KD, Editors. Williams Obstetrics. 22nd ed. New York : McGraw-Hill ; 2005 : 761-808.
2. Imperiale TF, Petrulis AS. Risk factors for and prevention of preeclampsia. J Watch Gen Med 1991 ; July 19.
3. Benedetti TJ, Benedetti JK, Stenchever MA. Severe preeclampsia-maternal and fetal outcome. Hypertension in Pregnancy 1982 ; 1(2-3): 401-16.
4. Thomas E, George SH, Tony YT. Hemoglobin Bart' s hydrops fetalis syndrome. In : Datta S, Hepner DL, editors. Anesthetics and obstetric management of high-risk pregnancy. 3rd ed. New York : Springer ; 2004 : 253-64.
5. Macafee CA, Fortune DW, Beischer NA. Non-immunological hydrops fetalis. Int Obstet Gynecol 2005 ; 77(3) : 226-37.
6. Thitadirok V, Chuchote-ros M. Pregnancy induced hypertension. In : Tannirandorn Y, Phupong V, editors. Maternal-fetal medicine. 2nd ed. bangkok : Pimdee ; 2008 : 73-91.
7. Haddad B, Louis-Sylvestre C, Doridot V, Touboul C, Abirached F, Paniel BJ. Criteria of pregnancy termination in women with preeclampsia. Gynecol Obstet Fertil 2002 ; 30(6) : 467-73.
8. Ayala DE, Hermida RC. Influence of parity and age on ambulatory monitored blood pressure during pregnancy. Hypertension 2001 ; 38 : 753-8.
9. Apichart C, Suwimon W, Somsak S. Pregnancy induced hypertension in twin pregnancy. J Med Assoc Thai 2005 ; 88(suppl 2) : 569-74.
10. Duckitt K, Harrington D. Risk factor for preeclampsia at antenatal booking : systemic review of controlled studies. BMJ 2005 ; 330 : 565.
11. Eskenazi B, Fenster L, Sidney S. A multivariate analysis of risk factors for preeclampsia. JAMA 1991 ; 266(2) : 237-41.
12. Hnat MD, Sibai BM, Caritis S, Hauth J, Lindheimer MD, MacPherson C, et al. Perinatal outcome in women with recurrent preeclampsia compared with women who developed preeclampsia as nulliparas. Am J Obstet Gynecol 2002 ; 186(3): 422-6.
13. Bombrys, Annette E, Barton, John R, Habli, Mounira, et al. Expectant management of severe preeclampsia at 27 to 33 week's gestation : maternaland perinatal outcome according to gestational age by weeks at onset of expectant management. Obstet Gynecol Surv 2009 ; 64(9) : 579-81.
14. Nassar AH, Adra AM, Chakhtoura N, Gomez - Marin O, Beydoun S. Severe preeclampsia remote from term : labor induction or elective cesarean delivery? Am J Obstet Gynecol 1998 ; 179(5) : 1210-3.
15. Kim LH, Cheng YW, Delaney S, Jelin AC, Caughey AB. Is preeclampsia associated with an

increased risk of cesarean delivery if labour is induced? J Matern Fetal Neonatal Med 2009 Dec 1 : 1-7.

16. Saade G, George R, Mattar F, Witlin A, Sibai B, Baha M, et al. Predictors of neonatal outcome in women with severe preeclampsia or eclampsia between 24 and 33 week's gestation. Am J Obstet Gynecol 2000 ; 182(3) : 607-11.