

Research Article

## Multiple Factors Affecting Length of Hospital Postpartal Care in Eclampsia Patients

### Faktor-Faktor yang Mempengaruhi Lamanya Rawat Inap Pasien Postpartum Eklampsia

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#### Abstract

**Objective:** To identify any factors that could cause longer care at hospitals in eclampsia patients.

**Methods:** It was a retrospective, cross sectional study design and conducted in Dr. Mohammad Hoesin Hospital Palembang from January 2005 to December 2009. This research conducted in 176 samples divided into 2 groups namely short-stay group (1-5 days) with 92 patients and longer stay group ( $\geq 5$  days) with 87 patients, with mean length of hospital stay  $5.41 \pm 3.43$  days.

**Results:** The most common mode of delivery in the group who stayed  $\geq 5$  days was cesarean section (44.8%), while the most common delivery route in the group who stayed  $< 5$  days was forceps extraction (43.5%). The mean thrombocytes count in the longer stay group was lower than in the short-stay group ( $213459.77 \pm 108391.81$  vs  $258945.65 \pm 92213.24$  mm<sup>3</sup>), which was significantly different ( $p=0.003$ ). Ureum and LDH concentration in longer stay group was higher, and statistic test was found to be significantly different ( $p<0.05$ ), while renal failure complication was mostly experienced by the longer stay group (20.7%).

**Conclusions:** Thrombocytes count, LDH, acute renal failure and ICU has significant difference and greater in postpartal eclampsia group that is longer treated.

[Indones J Obstet Gynecol 2012; 36-2: 75-80]

**Keywords:** complication, eclampsia, length of hospital stay

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#### Abstrak

**Tujuan:** Mengetahui faktor-faktor apa yang menyebabkan masa rawat di rumah sakit pada pasien eklampsia menjadi lebih lama.

**Metode:** Merupakan penelitian retrospektif dengan desain potong lintang yang dilakukan di RS Dr. Mohammad Hoesin Palembang bulan Januari 2005 sampai dengan Desember 2009. Penelitian ini dilakukan pada 176 sampel yang dibagi menjadi 2 kelompok yaitu kelompok masa rawat singkat (1-5 hari) 92 orang dan masa rawat panjang ( $\geq 5$  hari) sebanyak 87 orang, dengan rerata masa rawat  $5,41 \pm 3,43$  hari.

**Hasil:** Sebagian besar jenis persalinan pada kelompok lama rawatan  $\geq 5$  hari adalah seksio sesarea yaitu 44,8% sedangkan pada kelompok lama rawatan  $< 5$  adalah ekstraksi forseps yaitu 43,5%. Rerata trombosit pada kelompok lama rawatan  $\geq 5$  hari lebih rendah dibandingkan dengan kelompok lama rawatan  $< 5$  hari ( $213459,77 \pm 108391,81$  vs  $258945,65 \pm 92213,24$  mm<sup>3</sup>), dan secara statistik terdapat perbedaan bermakna ( $p=0,003$ ). Kadar ureum dan kadar LDH kelompok lama rawatan  $\geq 5$  hari lebih tinggi dibandingkan kelompok lama rawatan  $< 5$  hari, dan secara uji statistik terdapat perbedaan bermakna ( $p<0,05$ ). Sementara komplikasi gagal ginjal lebih banyak dialami kelompok lama rawatan  $\geq 5$  hari yaitu 20,7%, dibandingkan dengan kelompok masa rawat singkat, yaitu 5,4%.

**Kesimpulan:** Faktor trombosit, LDH, komplikasi gagal ginjal akut dan ICU memiliki perbedaan bermakna dan lebih besar pada kelompok eklampsia postpartum yang lebih lama dirawat.

[Maj Obstet Ginekolog Indones 2012; 36-2: 75-80]

**Kata kunci:** eklampsia, komplikasi, lama rawat

## INTRODUCTION

Preeclampsia is a particular disease in nulliparous women, occurring after 20 week gestational age and near term pregnancy. Preeclampsia and eclampsia is serious complication in pregnancy. According to the Royal College of Obstetricians and Gynecologists in 2006, incidence rate of preeclampsia patient is 5 per 1000 pregnancies, while the incidence rate eclampsia is 5 per 10,000 pregnancies in England, with mortality rate of 1.8% and 35% of the patients experiencing severe complication.<sup>1</sup>

As yet, preeclampsia and eclampsia has been a well-unresolved problem either in its pathophysiology or management. Preeclampsia and eclampsia have critical clinical importance owing to the fact that they are one of the issues increasing morbidity and mortality rate in Indonesia and other developing countries worldwide.<sup>1</sup>

There are 3 major causes of maternal mortality in obstetrics i.e. hemorrhage (45%), infection (15%), and hypertension in pregnancy (preeclampsia and eclampsia (13%). Others are obstructed labour, and unsafe abortion and other indirect causes.<sup>2</sup>

Maternal Mortality Rate (MMR) is a useful guide in describing nutritional status and maternal health, environmental health condition and prime health service, especially for pregnant, labouring and postpartal women. Other non-medical factors are also affecting this, such as economic, sociocultural, demography and religion.<sup>3</sup>

Until recently, MMR due to delivery has not decreased as expected. According to *Badan Koordinasi Keluarga Berencana Nasional (BKKBN)* in July 2005, MDR was 307 per 100,000 live births in 2002. Safe Motherhood in 1988, and Making Pregnancy Saver (PMS) programs were introduced to solve the problem. But according to *Survei Demografi Kesehatan Indonesia (SDKI)*, the decrement was only 228 per 100,000 live birth in 2009. Meanwhile, MMR remained high in 2010, with 467 per 100,000 in South Sumatera, and Palembang had 317 maternal death per 100,000 live birth in 2010.<sup>2,3</sup>

Preeclampsia are the state of hypertension and proteinuria due to pregnancy, diagnosed after 20 weeks gestational age or promptly after delivery. Eclampsia is an acute abnormality in pregnant, labouring, or postpartal women presented with seizure or coma state. The woman are usually experienced preeclamptic syndromes beforehand. The therapy is assigned to prevent the seizure, while eclampsia is to prevent further seizure. The management is in line with gestosis protocol in Dr. Moh. Hoesin Hospital Palembang, which is the administration of sulphide magnesium.<sup>4,5</sup>

To decrease maternal and perinatal mortality rate due to preeclampsia and eclampsia, routine antenatal care and pregnancy monitoring can assure a simple and cheap care in order to prevent maternal death due to eclampsia.<sup>6</sup>

Generally, eclampsia emerged with general seizure preceded with worsening preeclampsia and frontal area headache, visual disturbance, nausea, epigastric pain and hyperreflexy. If the condition is unknown and no prompt treatment, it may arise the seizure especially in labour. The complication may occur HELLP syndromes (Hemolysis Elevated liver enzyme Low Platelet count), pulmonary edema, kidney failure and other multiple organ failure.<sup>7,8</sup>

Preeclampsia and eclampsia incidence rate is 6%-8% among pregnant women.<sup>9</sup> It varied in some hospitals in Indonesia. In Dr. Pirngadi Hospital

Medan (RSPM), the rate was ranging from 5.75-14%, in 1993-1997, while the rate in Dr. Hasan Sadikin Hospital (RSHS) was 13% in 1996-1997, and the rate in Dr. Cipto Mangunkusumo Hospital (RSCM) was 9.17% in 2002.<sup>2</sup> Meanwhile, in Dr. Moh. Hoesin Hospital (RSMH) Palembang, the incidence rate was 12.7% and there were 56 eclampsia cases (1.8%) out of 3058 deliveries in 2009.<sup>2,5</sup>

Labour process in pregnancy with preeclampsia or eclampsia requires special care compared to normal labour. Moroy et al reported that eclamptic women may have longest hospitalization  $5.60 \pm 2.12$  days and the shortest  $2.48 \pm 0.79$  days, with further observation period after eclampsia onset in long-care group is longer than in short-care group ( $912.11 \pm 27.63$  vs  $5.08 \pm 6.08$  hours). The comparison of patients administered sulphide magnesium therapy for more than 12 hours is greater in long-care group and the mode of delivery.<sup>10</sup>

Wlodzimier and Hanna reported that the mean of length of stay in normal labour is 4.03 days and cesarean section is 6.21 days, while in less than 37 week labour and the complication is relative longer. Marianne studied that pregnant women sociodemography factor affects length of stay in the hospital. Whereas in Watt et al reported significant increase for longer care for mother and baby experiencing the complication in pre- and post delivery.<sup>11-13</sup>

Management and care in eclamptic patients are expected to decrease and prevent the complication and shortened length of stay of eclamptic patients in hospital. Parameter performed in this study is to use blood study result in eclamptic patients.

Data for length of stay and any factors found in eclamptic patients requiring longer stay in Dr. Moh. Hoesin Hospital Palembang has not yet been conducted. Therefore it requires a research identifying factors in postpartal eclamptic patients and how the average of length of stay treated in Obstetrics and Gynecological ward Dr. Moh. Hoesin Hospital Palembang during last five years.

## METHOD

It was a retrospective and cross-sectional study applied in antepartal, intrapartal, and postpartal eclamptic patients. The research proposal had been approved by Bioethics and Humanities unit of medi-

cal faculty of Sriwijaya University. The data collection was taken from the medical records in Dr. Mohammad Hoesin Hospital, Palembang, started in October 2009 until 31 May 2010. The subjects in this research were eclamptic women treated in obstetrics ward.

Research data was collected in prepared form. Data was statistically processed by using SPSS 14, in which the numeric data was analyzed by T-test, dichotomy or categories variable was analyzed by Chi-square or Fisher's Exact test and linear regression analysis for factors affecting length of stay.

### RESULT

The mean of length of hospital stay in 179 eclampsia cases during 2005-2009 was 5.41±3.43 days. The subjects was divided into 2 groups based on length of hospital stay: ≥ 5 days group and < 5 days group. There were 87 subjects (48.6%) staying ≥ 5 days and 92 subjects (51.4%) staying < 5 days.

Most subjects were in ≥5 days hospital stay, ranging from 20-35 years, 80.5% as well as in < 5 days was 67.4%. The greatest parity percentage of subjects in ≥ 5 days group found parity 1 was 55.2% as well as in < 5 days was 62.0%. Parity 7 and 8 was included in < 5 days group, 4.3% and 1.1%, respectively. The most common gestational age found in ≥ 5 days hospital stay in aterm pregnancy was 44.8% as well as in < 5 days was 73.9%. The most common delivery mode in the research subjects in ≥ 5 days hospital stay group found cesarean section was 44.8% while in < 5 group was forceps extraction was 43.5%. Distribution of mode of delivery completely shown in Table 1.

**Table 1.** Distribution of mode of delivery

Mode of delivery	Length of hospital stay			
	≥ 5 days		< 5 days	
	n	%	n	%
Spontaneous	25	28.7	17	18.5
Forceps extraction	22	25.3	40	43.5
Partial extraction	0	0.0	1	1.1
Total extraction	0	0.0	1	1.1
Vacuum extraction	0	0.0	7	7.6
Embriotomy	1	1.1	1	1.1
Cesarean section	39	44.8	25	27.2
Total	87	100.0	92	100.0

Most subjects in both ≥ 5 days hospital stay group and in < 5 days group had body mass index > 25 (48.3% and 51.1%, resectively). Most subjects in ≥ 5 days hospital stay lives in rural area (50.6%), while the subjects in < 5 days hospital stay group lived in urban area (51.1%).

From the study, we found that the mean of systolic blood pressure in ≥ 5 days length of hospital stay was 171.61±24.05 mmHg and diastolic was 108.89±12.98 mmHg. Other was 171.30±18.35 mmHg for systolic and 109.02±11.00 mmHg for diastolic. There was no statistically significant difference between systolic blood pressure and diastolic. The data is shown completely in Table 2.

**Table 2.** Clinical characteristic of subjects

Variable	Length of hospital stay		p
	≥ 5 days (mean±SD)	< 5 days (mean±SD)	
Systolic BP (mmHg)	171.61±24.05	171.30±18.35	0.924
Diastolic B0 (mmHg)	108.89±12.98	109.02±11.0	0.633

*t-test SD = standard deviation*

Subjects' characteristics based on hematology profile found that the mean hemoglobine level in ≥ 5 days hospital stay was 11.38±2.07 g/dl while in < 5 days was 11.32±1.68 g/dl. Mean of thrombocytes count in ≥ 5 days hospital stay was lower than in < 5 days group (213459.77±108391.81 vs 258945.65±92213.24mm<sup>3</sup>), and there was a statistically significant difference (p=0.003). The hematocrites, and leucocytes count suggested no statistically significant difference (p>0.05).

According to biochemical study, the mean value of AST and ALT concentration in ≥ 5 days length of hospital stay group was higher than in < 5 days group, and there was statistically significant difference (p<0.005). The uric acid concentration in ≥ 5 days length of hospital stay group was higher than in < 5 days group, nevertheless there was no significant difference (p=0.353). Mean ureum and LDH concentration in ≥ 5 days length of hospital stay group was higher than in < 5 days, and there was a statistically significant difference (p<0.05). Creatinine, proteinuria, direct bilirubine, indirect bilirubine and total bilirubine statistically suggested no significant difference (p>0.05).

**Table 3.** Biochemical characteristics of subjects

Variable	Length of hospital stay		P
	≥ 5 days (mean±SD)	< 5 days (mean±SD)	
AST	87.64±77.61	52.86±51.61	0.001
ALT	58.71±52.55	37.67±30.55	0.023
Uric acid	7.12±3.01	6.75±2.21	0.353
Ureum	40.02±34.79	25.86±21.05	0.001
Creatinine	1.16±0.71	1.50±1.42	0.531
Proteinuria	+ 2	+ 2	0.533
Protein	5.83±1.15	6.01±1.37	0.350
LDH	791.07±585.36	526.04±399.09	0.001
Direct Bilirubine	0.37±0.35	0.34±0.23	0.604
Indirect Bilirubine	0.39±0.26	0.38±0.32	0.934
Total Bilirubine	0.72±0.58	0.66±0.50	0.491

The live birth in ≥ 5 days length of hospital stay group was 77.1% and in < 5 days group, it was 88.1%. The percentage of subjects with 1 minute Apgar score > 8 in ≥ 5 days length of hospital stay group was 28.7%, while in < 5 days group, it was 43.5%.

There were 11 complications due to eclampsia found through 2005-2009 such as pulmonary edema, acute renal failure, heart failure, HELLP syndrome, placental abruption, DIC, PPH, CVD, sepsis, IUFD, and ICU. The percentage of pulmonary edema for both group was 1.1% and based on Fisher statistic test, there was no significant difference of pulmonary edema occurrence rate for both group ( $p=0.999$ ). Renal failure, was mostly found in ≥ 5 days hospital stay (20.7%) compared to in < 5 days group (5.4%), and there was a statistically significant difference ( $p=0.002$ ).

The incidence rate of heart failure in the ≥ 5 days length of stay group was 4.6% and there no significant difference ( $p=0.054$ ) with the < 5 days group. The incidence of HELLP syndrome in ≥ 5 days hospital stay group was 67.8%, and compared to < 5 days group (5.4%), there was a statistically significant difference ( $p=0.001$ ).

## DISCUSSION

Most subjects in ≥ 5 days length of stay was in the age range of 20-35years old (80.5%) with the most common parity is primipara (55.2%). This characteristic was not different from < 5 days length of hospital stay was 62.0% ranging from 20-35 year old and 67.4% with parity 1. The greatest of gestational age in ≥ 5 length of hospital stay found in

at term pregnancy (44.8%) as well as in < 5 days length of hospital stay (73.9%). In ≥ 5 length of hospital stay, cesarean section was 44.8% with body mass index > 25 was 48.3% while in < 5 length of hospital stay found forceps extraction was 43.5% with body mass index > 25 was 51.1%.

Distribution of eclamptic patients' age in this study was in line with Moroy et al study, reported that mean of eclamptic patients' age with > 3 days length of hospital stay was 24 years.<sup>10</sup>

Cunningham and Gant reported that serious morbidity in postpartal women seldom occur in vaginally delivery women.<sup>6</sup> In this study, cesarean section was more common in longer hospital stay group than in shorter stay group, though it was not statistically significant. The increasing number of cesarean section affected length of hospital stay with longer wound healing and possibility to stay in hospital due to surgical intervention complication.<sup>1,13</sup>

Hypertension in pregnancy is one of the major maternal mortality causes. In our study, all subjects experienced chronic hypertension, and we found that the mean systolic blood pressure in ≥ 5 days length of hospital stay group was 171.61±24.05 mmHg and mean of diastolic blood pressure 108.89±12.98 mmHg. Meanwhile, in < 5 days length of hospital stay, the mean systolic blood pressure was 171.30±18.35 mmHg and mean of diastolic blood pressure 109.02±11.00 mmHg. Thus we found no significant difference between systolic and diastolic blood pressure in both groups ( $p > 0.05$ ).

According to trophoblast invasion theory in which abnormal trophoblast invasion are not reaching miometrial muscles layer so spiralis artery remained rigid and hardenend, therefore failure of remodelling spiralis artery. It causes decreasing uteroplacental flow so placental hypoxia and ischemia occurs. Then this condition develops and initiates hypertension.<sup>14,15</sup>

Laboratory study also determined the length of hospital stay. Laboratory study in eclamptic patients should be performed daily until there was no increasing laboratory profile and they reach normal value. Normally, the lab results improved after 24-48 hours postpartum.

According to hematology study, the mean of thrombocytes count in ≥ 5 days length of stay group was lower than < 5 days group (213459.77 ±108391.81 vs 258945.65±92213.24 mm<sup>3</sup>), statis-

tically found significant difference ( $p=0.003$ ). It found no significant difference for hemoglobine, hematocrite, and leucocytes ( $p>0.05$ ). Routine laboratory study performed in this patient is to prevent the increasing of normal concentration causing deterioration of the disease if no prompt treatment given.

In biochemical study, mean of AST and ALT in  $\geq 5$  days length of hospital stay was higher than  $< 5$  days group, statistically found no significant difference ( $p<0.005$ ). For the mean of uric acid in  $\geq 5$  days length of hospital stay was higher than in  $< 5$  days group, but found no significant difference ( $p=0.353$ ). Mean of ureum and LDH concentration in  $\geq 5$  days length of hospital stay was higher than in  $< 5$  days group, and statistic test found significant difference ( $p<0.05$ ). It found no statistically significant differences in creatinine, proteinuria, direct bilirubine, indirect bilirubine, and total bilirubine ( $p>0.05$ ).

One of the objectives to perform biochemistry study is to rule out HELLP syndrome. Complete HELLP syndrome may consists of AST  $> 70$  IU/l, LDH  $> 600$  IU/l, bilirubine  $> 1.2$  mg/dl, thrombocytes  $< 100,000/\text{mm}^3$ , and so called partial HELLP syndrome if found one or more symptoms mentioned above HELLP syndrome was classified based on thrombocytes count; class I if thrombocytes count  $\leq 50,000/\text{mm}^3$ , class II if thrombocytes count  $> 50,000/\text{mm}^3 \leq 100,000/\text{mm}^3$  and class III if thrombocytes count  $> 100,000/\text{mm}^3 \leq 150,000/\text{mm}^3$  result of the study suggested that there is complication due to eclampsia in both groups such as pulmonary edema, acute renal failure, heart failure, HELLP syndrome, placental abruption, DIC, PPH, CVD, sepsis, IUFD, and ICU. The frequent complication found in eclamptic patients is HELLP syndrome compared to the existing complication in this study. The complication mostly experienced by  $\geq 5$  days length of hospital stay group.

This complication may cause maternal mortality if not promptly treated, Manurung et al found that risk factors related to maternal mortality in preeclampsia and eclampsia case were gestational age, history of hypertension, AST concentration more than  $150/\mu\text{l}$ , creatinin  $1.5$  mg/dl, and IUFD. Maternal complication related to mortality are pulmonary edema, DIC, acute renal failure, and cerebrovascular accident. Mattar and Sibai (2000) collected data about complicating factors in 399 cases with eclampsia from 1977 to 1998 in central ser-

vice in Memphis. Major complicating factors were placental abruption (10%), neurological deficit (7%), pneumonia aspiration (7%), pulmonary edema (5%), cardiac arrest (4%), acute renal failure (4%) and maternal mortality (1%).<sup>3,14-16</sup>

From all factors we assumed to have influences in the length of postpartal care in hospital, we found that abnormal ALT concentration and ICU stay in patients with HELLP syndrome play critical role in determining length of postpartal care in hospital in eclampsia patients.

Significant factor influencing the length of hospital stay in our study is different from the study by Moroy P et al study, reported that length of hospital stay of eclamptic patients mainly influenced by diastolic blood pressure, interval between eclampsia and delivery, mode of delivery and magnesium therapy duration.<sup>12</sup>

In other study, Wlodzimier and Hanna reported that mean of length of hospital stay in normal labour was 4.03 days and cesarean section was 6.21 days while in  $< 37$  week gestational age and complication are relatively longer. In Marianne study, they reported that sociodemographic factors of pregnant women influenced the length of hospital stay, where as Watt et al reported that there was significant increase in longer hospital care period in mother and her baby, experiencing prepartal and postpartal complication.<sup>11-13</sup>

## CONCLUSION

Factors influencing postpartal care in hospital in preeclampsia patients are HELLP syndrome, ALT concentration and ICU. From this research, we found that it is necessary to perform close monitoring to biochemistry parameter in order to prevent the occurrence of complications such as HELLP syndrome.

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