ORIGINAL ARTICLE:

Severe preeclampsia leads to higher prevalence of mortality and morbidity affecting maternal outcomes in single tertiary hospital

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ABSTRACT

Objective: The purpose of this study was to determine the maternal outcomes of severe preeclampsia at RSUD Dr. Soetomo Surabaya in January 2013-December 2014.
Materials and Methods: This research was a descriptive study with cross-sectional design to observe maternal characteristics and maternal outcomesof severe preeclampsia. Data were retrieved from medical records of severe preeclampsia patients admitted to Obstetric Ward of Dr Soetomo Hospital, from January 2013 to December 2014. This study used total sampling for collecting its data. These data were proccessed descriptively and presented in graphic, tables, and short description.
Results: From January 2013 to December 2014 there were 386 (44.2%) cases of severe preeclampsia that were included in this study from a total of 874 cases available. The maternal outcomes of severe preeclampsia consisted of 42 cases (10.9%) of HELLP syndrome, 36 cases (9.3%) of pulmonary edema, 225 cases (58.3%) of sectio caesarea, 7 cases(1.8%) of antepartum bleeding with 5 cases (1.3%) of placenta previa and 2 cases (0.5%) of solutio placenta, 2 cases (0.5%) of postpartum bleeding, 8 cases (2.1%) of eclampsia, 31 cases (8%) of impending eclampsia, 5 cases (1.3%) of acute kidney injury, and 2 cases (0.5%) of maternal death.
Conclusion: In conclusion, this study shows that severe pre-eclampsia patients have high prevalence of mortality and morbidities that affects maternal outcomes. It also reccommends that all patients with severe preeclampsia need to receive intensive maternal and fetal care. It is necessary to do careful complication examination, prevention of seizures using magnesium sulfate, and continous fetal and maternal monitoring.

Keywords: severe preeclampsia; maternal outcomes

ABSTRAK

Tujuan: Mengetahui profil luaran maternal pada penderita PEB di RSUD Dr. Soetomo Surabaya periode Januari 2013-Desember 2014
Bahan dan Metode: Penelitian ini merupakan penelitian deskriptif menggunakan rancangan penelitian studi cross-sectional untuk mengetahui data karasteristik ibu hamil dan luaran maternal pada penderita PEB di RSUD Dr. Soetomo Surabaya periode Januari 2013-Desember 2014. Data yang dipakai berupa data sekunder yaitu catatan medis dengan menggunakan teknik total sampling. Data yang dikumpulkan diolah secara deskriptif dan disajikan dalam bentuk grafik, tabel beserta uraian mengenai data yang didapat.
Hasil: Jumlah ibu hamil penderita PEB yang dirawat di Instalasi Rawat Inap Obsgin RSUD Dr. Soetomo Surabaya periode Januari 2013-Desember 2014 adalah sebanyak 874 orang, namun hanya ada 386 (44,2%) rekam medis pasien yang memenuhi kriteria inklusi penelitian ini. Luaran maternal pada PEB didapatkan 42 kasus (10.9%) HELLP syndrome, 36 kasus (9.3%) edema paru, 225 kasus (58.3%) sectio caesarea, 7 kasus (1.8%) perdarahan antepartum dengan 5 kasus (1.3%) plasenta previa dan 2 kasus (0.5%) solusio plasenta, 2 kasus (0.5%) perdarahan postpartum, 8 kasus (2.1%) eklamsia, 31 kasus (8%) impending eclampsia, 5 kasus (1.3%) gagal ginjal akut, dan 2 kasus (0.5%) kematian maternal.
Simpulan: Penelitian ini menunjukkan bahwa ibu hamil dengan PEB memiliki risiko mortalitas dan morbiditas yang tinggi serta memengaruhi luaran maternal. Untuk itu perlu dilakukan perawatan intensif di rawat inap yang meliputi pencegahan kejang dengan magnesium sulfat, monitoring rutin keadaan umum maternal maupun janin, serta penilaian komplikasi maternal.

Kata kunci: preeklamsia berat; luaran maternal

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INTRODUCTION

Preeclampsia is a pregnancy-specific hypertensive disease with multisystem involvement that usually characterized by the new-onset of hypertension and proteinuria after 20 weeks of gestation in previously normotensive woman.[1] Preeclampsia occured in 3-5% of pregnancy and one of the main cause of maternal death, especially in developing country.[2] More than 30% of maternal death in Indonesia in 2010 was caused by hypertensive disorders of pregnancy.[3] In Surabaya, preeclampsia/ eclampsia is the major contributor of maternal and perinatal deaths, whereas in East Java maternal death reached 114/100.000 of live births.[4] Based on data obtained at the obstetric ward of Dr. Soetomo Hospital Surabaya, from January 2013 to December 2014 there were 386 (44,2%) cases of severe preeclampsia that were included in this study from a total of 874 cases available.

Severe features of preeclampsia include systolic blood pressure of 160 mmHg or higher or diastolic blood pressure levels of 110 mmHg or higher on two occasions at least 4 hours apart, along with new evidence of thrombocytopenia (platelet count less than 100,000/microliter), impaired liver dysfunction, renal insufficiency, pulmonary edema, or new-onset visual or cerebral disturbance.[5]

There are several maternal outcomes in preeclampsia such as eclampsia, stroke, abruptio placenta, disseminated intravascular coagulation, HELLP syndrome, liver hemorrhage/rupture, pulmonary edema/aspiration, adult respiratory distress syndrome, acute renal failure, death, chronic hypertension, diabetes mellitus, chronic renal failure, coronary artery disease, neurologic deficit.[6] Severe preeclampsia increases the risk of maternal motality and morbidities. Therefore, this study aims to determine the maternal outcomes of severe preeclampsia at RSUD Dr. Soetomo Surabaya in January 2013-December 2014.

MATERIALS AND METHODS

This research was a descriptive study with cross-sectional design to observe maternal characteristics and maternal outcomes of severe preeclampsia. Data were retrieved from medical records of severe preeclampsia patients admitted to the Obstetric Ward of Dr Soetomo Hospital Surabaya, from January 2013 to December 2014. This study used total sampling for collecting its data. The population of the study was patients with severe preeclampsia from January 2008 to December 2012 with complete medical records.

Preeclampsia is defined as a multisystem disorder that can manifest clinically with hypertension and proteinuria with or with-out accompanying symptoms, abnormal maternal laboratory test results, intra-uterine growth restriction, or reduced amniotic fluid volume.

The maternal outcomes are HELLP syndrome, pulmonary edema, delivery methode, antepartum bleeding, postpartum bleeding, eclampsia, impending eclampsia, acute kidney injury, and maternal death. These data were proccessed descriptively and presented in graphics, tables, and short descriptions.

RESULTS AND DISCUSSION

There were 386 (44,2%) cases of severe preeclampsia that were included in this study from a total of 874 cases available from January 2013 to December 2014 at the obstetric ward of Dr. Soetomo Hospital Surabaya. Table 1. shows maternal characteristics with severe preeclampsia. The mean maternal age in this study was 31.18 years and the standard deviation (SD) was ± 6.54, whereas the mean gestational age was 36.92 and the SD was ± 4.121.

Table 2 shows the maternal outcomes of severe preeclampsia. Based on data, there were 380 women (98.4%) have single pregnancies and 6 women (1.6%) have twin pregnancies. So that we could obtain total newborn at Dr. Soetomo Surabaya in 2013-2014 was 392 babies.

Most of woman with severe preeclampsia at Dr. Soetomo Surabaya in 2013-2014 delivered an aterm newborn (56.2%), mainly in the gestational age of 40 weeks. Posterm is the smallest gestational ages (0.8%) with the oldest was 43 weeks. Meanwhile, the youngest was 20 weeks of gesatational ages.

The average maternal age of severe preeclampsia at obstetric ward of Dr. Soetomo Hospital Surabaya from January 2013 to December 2014 was 20-34 years old (64.8%), followed by ≥35 years old (32.1%) and < 20 years old (3.1%). This was consistent with research conducted by Akbar, Wicaksono, & Dachlan (2012) at Dr. Soetomo Surabaya in 2008 in which, mainly the characteristic features in early onset type as follow 70% they were reproductive ages (20–35 years old), 60% was 24–32 gestational weeks.[7] Pregnancy in this productive age occured because of social changing that affected sexual behavior.[8] Analysis of SPSS in this study show that maternal ages more than 40 years old was 1.5 the risk of severe preeclampsia (OR 1.48;). According to other study conducted by Duckitt &

Harrington (2005) maternal age ≥40 double the risk of severe preeclampsia.[9]

Table 1. Maternal characteristics with severe preeclampsia

Characteristics	Number (%)
Maternal age (n = 386)	
12-16 years old	2 (0.5)
17-25 years old	84 (21.8)
26-35 years old	194 (50.2)
36-45 years old	106 (27.5)
Pregnancy (n = 386)	
Single pregnancy	380 (98.4)
Multiple pregnancy	6 (1.6)
Gestational Age (n = 386)	
Preterm (<37 weeks)	130 (33.7)
Aterm (37- 41 weeks)	253 (65.5)
Post term (>41 weeks)	3 (0.8)
Parity (n = 386)	
Nulliparity	156 (40.4)
Primiparity (parity=1)	129 (33.4)
Multiparity (parity=1-3)	99 (25.6)
Grandemulti (parity >4)	2 (0.5)
Body Mass Index (n = 386)	
Underweight (<18,5 kg/m^2)	4 (1)
Normal (18,5-24,9 kg/m^2)	290 (75.1)
Overweight (≥25 kg/m^2)	3 (0.8)
Obesity Grade I (30-34,9 kg/m^2)	37 (9.6)
Obesity Grade II (35-39,9 kg/m^2)	25 (6.5)
Obesity Grade III (≥40 kg/m^2)	27 (7)
Pre-existing medical conditions (n = 386)	
Hepatitis	14 (3.6)
Pneumoniae	4 (1)
Jaundice in pregnancy	1 (0.3)
Cardiac disease	4 (1)
Stroke	1 (0.3)
HIV	1 (0.3)
Chronic hypertensions	38 (9.8)
Systemic Lupus Erythematosus	2 (0.5)
Metabolic encephalopathy	1 (0.3)
Tuberculosis	1 (0.3)
Gestational diabetes	11 (2.8)
Abdominal tinea corporis	1 (0.3)
Hiperthyroid	4 (1)
Meningioma	2 (0.5)
Hepatitis and HIV	1 (0.3)
Hepatitis and hypertension	3 (0.8)
Hypertension and pneumoniae	1 (0.3)

Nulliparity double the risk of severe preeclampsia.[10] These previous study was contradictory with the research at Dr. Soetomo Surabaya in 2013-2014. Based on data analysis, nullipara were at 1.07 times higher risk of severe preeclampsia (OR 1,066). This difference may be caused by the small sample size especially in the the cases of nulliparity without severe preeclampsia. These resulted an insignificant value.

Table 2. Maternal outcomes of severe preeclampsia

Characteristics	Number (%)
HELLP syndrome (n=386)	
Yes	42 (10.9)
No	344 (89.1)
Pulmonary edema (n=386)	
Yes	36 (9.3)
No	350 (90.7)
Delivery (n=386)	
Spontaneus	113 (29.3)
Sectio caesarea	227 (58.8)
Conservative	13 (3.4)
Vacum	17 (4.4)
Forceps	11 (2.8)
Breech	5 (1.3)
Antepartum bleeding (n=386)	99 (25.6)
Solutio placenta	2 (0.5)
Placenta previa	5 (1.3)
No bleeding	379 (98.2)
Postpartum bleeding (n=386)	
Yes	2 (0.5)
No	384 (99.5)
Eclampsia (n=386)	
Yes	8 (2.1)
No	378 (97.9)
Impending eclampsia (n=386)	
Yes	31 (8)
No	355 (92)
Acute Kidney Injury (n=386)	
Yes	5 (1.3)
No	381 (98.7)
Maternal death (n=386)	
Yes	2 (0.5)
No	384 (99.5)

This study results show that there were 89 woman (23.1%) with body mass indexes of ≥30 kg/m2. In addition, there were 3 cases (0.8%) of overweight with severe preeclampsia were This study result was consistent with research findings by Raras (2011) at RSUP Dr. Kariadi Semarang in which, 64 cases (58.2%) had a body mass index ≥30 kg/m2 dan 2 cases (1,8%) had a body mass index ≤19 kg/m^2.[11]

The majority of preexisting medical condition in women with severe preeclampsia at Dr. Soetomo Surabaya in 2013-2014 was chronic hypertension (11.9%). A study by Raras (2011) at RSUP Dr. Kariadi Semarang showed a consistent result as follow 19 cases (8.1%) of hypertension.[11]

The major maternal outcomes occured in severe preeclampsia at Dr. Soetomo Surabaya in 2013-2014 was HELLP syndrome (10.9%). This result was lower than that of previous study conducted by Akbar, Wicaksono, & Dachlan (2012) at RSUD Dr. Soetomo Surabaya in 2010. These study found that 12.5% of 210 severe preeclampsia cases developed HELLP syndrome.[7] The rate of HELLP syndrome/thrombo-cytopenia in Sibai's and Barton's study ranged from 4.1%-27.1%, whereas the rate of pulmonary edema

ranged from 0-8.5%.[12] During Weiner's study period, 589 out of 25,391 deliveries (2.3%) were complicated with preeclampsia, of them 223 (37.9%) had severe preeclampsia without HELLP syndrome (severe PE group) and 64 (10.9%) had severe PE with HELLP syndrome.[13]

The second maternal oucomes after HELLP syndrome at Dr. Soetomo Surabaya in 2013-2014 was pulmonary edema (9.3%). This figure was higher than previous study by Hermanto et al (2014) at the same hospital in 2012. They found that in the referral center along the year of 2012, out of 477 preeclampsia–eclampsia cases 27 cases were complicated by pulmonary edema and were admitted to the obstetric intensive care unit for strict monitored treatment.[14] In 2008 classic data researched by Akbar, Wicaksono, & Dachlan (2012) at RSUD Dr. Soetomo Surabaya indicated bad referral system application of severe preeclampsia and eclampsia cases that they came lately into their teaching hospital's intensive care unit with approximately 12.6% major complications consist of 50% lung oedema and the remain with placental abruption and cerebral bleeding.[7]

Based on this study at Dr. Soetomo Surabaya in 2013-2014, delivery performed as soon as after maternal stabilization (96.6%) was more than expectant management deliveries (3.4%). Pregnancy prolongation and improved newborn outcomes are associated with the application of expectant management of severe preeclampsia remote from term. After initial maternal stabilization, women with persistent symptoms of severe preeclampsia, uncontrollable severe hypertension, eclampsia, pulmonary edema, abruptio placentae, disseminated intravascular coagulation, significant and new-onset renal dysfunction, and those who have abnormal fetal surveillance results, should typically be delivered.[1] Data collected at Dr. Soetomo Surabaya in 2013-2014 showed that there were more sectio caesarea cases (58.3%) than normal delivery (29.3%). The cesarean rate was twice as high in induced labor than in spontaneous labor in all pregnancies (21.1% vs 11.8%) and also one in 3 nulliparous women was delivered with cesarean section (31.2%).[15] The cesarean section rate among reported studies ranged from 66%-96%, with the higher rates for patients with severe pre-eclampsia at <28 weeks of gestation.[12]

There were 7 cases (1.8%) of antepartum bleeding with severe preeclampsia at Dr. Soetomo Surabaya in 2013-2014. In this study, placenta previa cases (1.3%) was more than solutio placenta (0.5%). This was consistent with research conducted by Raras (2011) at RSUP Dr. Kariadi Semarang in 2010 which found that placenta previa cases (4.3%) were higher than solutio placenta (0.4%).[11] Based on data obtained at Dr. Soetomo Surabaya in 2013-2014, postpartum bleeding cases (0.5%) was lower than antepartum bleeding. This study was contradictory with the previous research by Joost et al (2012) which found that the prevalence of postpartum haemorrhage in the studied population was 4.9%. From the 7,288 women with preeclampsia 634 (8.7%) developed postpartum haemorrhage, compared to 14 348 (4.6%) from the women without preeclampsia. (OR 2.0, 95% CI 1.8-2.1).[16]

The presence of new-onset grand mal seizures in a woman with preeclampsia and it can occur before, during, or after labor is defined as eclampsia.[5] Research conducted by Thornton et al (2013) showed that in total there were 597 episodes of seizure in 529 pregnancies.[17] Fifty-five women experienced more than1 seizure in 1 pregnancy and 4 women experienced one seizure in 2 pregnancies. This equates to an overall seizure event rate of 8.6/10,000 births. Meanwhile, study at Dr. Soetomo Surabaya in 2013-2014 found 8 cases (2.1%) of eclampsia.

There were 31 cases (8%) of impending eclampsia found at Dr. Soetomo Surabaya in 2013-2014. This was consistent with research conducted by Raras (2011) in which there were 19 cases (8,1%) of impending eclampsia at RSUP Dr. Kariadi Semarang in 2010.[11]

Akbar, Wicaksono, & Dachlan (2012) at RSUD Dr. Soetomo Surabaya in 2010 found that there were 40% of women with severe preeclampsia experienced renal failure.[7] Based on data obtained at Dr. Soetomo Surabaya in 2013-2014, there were 5 cases (1.3%) of acute kidney injury. It means that this was lower than the previous study. Meanwhile another study by Curiel-Balsera et al (2011), found that there were fourteen percent of severe preeclampsia developed some types of complication, specifically heart failure in 23 subjects (9%), acute renal failure in 14 (5%) and coagulation disorders in 6 cases (2%).[18]

Severe preeclampsia increased the risk of maternal mortality (0.2%) and increased the rates of maternal morbidities (5%), such as convulsions, pulmonary edema, acute renal or liver failure, liver hemorrhage, disseminated intravascular coagulopathy, and stroke.[6] The mortality rate of patients with severe preeclampsia were 1.5%.[17] Meanwhile, this study found two cases (0.5%) of maternal death at Dr. Soetomo Surabaya in 2013-2014. All of these death cases was had septic shock and acute kidney injury. In this study, RR and OR value could not be counted because of the less data obtained such as cases without severe preeclampsia.

CONCLUSION

This study shows that severe preeclampsia patients have high prevalence of mortality and morbidities that affects maternal outcomes. It also suggests that all patients with severe preeclampsia need to receive intensive maternal and fetal care. It is necessary to do close monitoring for rapid progression of the disease and also during the initial assessment, evaluate maternal and fetal condition, intravenous magnesium sulfate seizure prophylaxis.

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