



Body Mass Index and Albumin Level In Severe Preeclampsia Conservative Treatment Cases

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ABSTRACT

Background : Severe preeclampsia is an obstetrical problem and one of the leading cause of death in obstetric. Conservative treatment for severe preeclampsia is a complicated and risky choice, but still a considerable option to achieve a better fetal outcome. Many factors that influence the results of conservative management are complex and still very much controversial. **Objective:** To study the BMI and albumin level of severe preeclampsia patients who underwent conservative management in dr. Soetomo General Hospital obstetric ward in 2018 – 2019. **Method:** This is a descriptive cross sectional study, where the data are obtained from morning reports, obstetric ward registry and dr. Soetomo General Hospital medical record during 2018 – 2019. **Results:** The total conservative cases were 51 in 2018 and 69 in 2019. The majority of the patients were 20-34 years old, multigravida, non-booked cases, Javanese ethnicity, and addressed in Surabaya. Most of them were obese (with BMI ≥ 30 kg/m²) with similar BMI distribution in the successful and unsuccessful conservative management groups. Most of our patients had albumin level below 3,5 g/dl. The majority of the patients were terminated by caesarean section with the fetal outcome mostly weighed less than 2000 g. **Conclusion:** The majority of the patients treated conservatively were 20-34 years old, multigravida, non-booked cases, Javanese ethnicity, and addressed in Surabaya. Most of the patients have BMI ≥ 30 kg/m² and albumin levels below 3,5.

Introduction

Preeclampsia is one of the obstetric problems with prevalence 8% from total pregnancy (Drife JO, 1986). Severe preeclampsia is estimated to occur in 1% of all pregnancies (Jang HC, 1997). WHO estimates that the incidence of preeclampsia is seven times higher in

developing countries than in developed countries (Osungbade KO, 2011). Preeclampsia is a major cause of maternal death (15-20%) in developing countries and causes short-term or long-term maternal morbidity, perinatal death, preterm labor, and impaired fetal growth (George EM, 2014). Preeclampsia

Foundation states preeclampsia is one of the three main causes of maternal morbidity and mortality globally, around 15-20% of maternal deaths worldwide are due to preeclampsia (Brown MA, 1996). It is estimated that preeclampsia contributes to maternal deaths of 50,000-60,000 annually worldwide (Gathiram, 2016). In addition, preeclampsia can increase the risk of cardiovascular disease in both mother and fetus in later life (Djannah, 2010).

In Indonesia, severe preeclampsia and eclampsia are the cause of maternal deaths (1.5-25%), and infant deaths (45-50%). In 2010 to 2013 hypertension was the cause of maternal mortality by 21.5-27.1%, which has increased every year. More than 30% of maternal deaths in Indonesia in 2010 were caused by preeclampsia-eclampsia. In 2015, East Java Province reported a maternal mortality rate due to preeclampsia and eclampsia by 31% (Dinas Kesehatan Provinsi Jawa Timur, 2015).

Of all the severe preeclampsia features, proteinuria is one of the most important diagnostic and prognostic variables determining the clinical significance of pregnancy-related hypertension. Severe proteinuria predicting time to delivery, severe proteinuria, and results in urinary albumin loss and hypoalbuminemia. Increased vascular permeability also leads to additional albumin loss from the intravascular spaces. Moreover, hypoalbuminemia in preeclampsia could be the result of reduced hepatic blood flow, which is secondary to hypovolemia created by higher filtration pressure in the capillaries. Thus, hypoalbuminemia can be identified as an early sign in developing preeclampsia (Gojnic M, 2004).

Meanwhile, obesity is a rising problem in recent modern days. Obesity prevalence is increasing at an alarming rate in both high-and low-income countries. The prevalence of obesity in European women ranges from 10–25%. The risk of preeclampsia has been shown to increase with an increasing BMI, with the lowest prevalence among underweight women. In a recent British study, extremely obese women were shown to have a fourfold increased risk of developing preeclampsia, compared to women of normal weight. Some studies have referred to obesity as a risk factor for preeclampsia and showed that the relationship between maternal weight and preeclampsia is a progressive risk and varies from 4.3% in women with a BMI 19.8 kg/m², up to 13.3% for women with a BMI 35 kg/m² (Chu J, 2020).

Pregnant women with severe preeclampsia are usually advised to undergo immediate delivery to prevent complications in mother and fetus. Severe preeclampsia is actually a progressive disease and no medical treatment can prevent the progression of this disease. Labor is a major treatment to consider if severe preeclampsia occurs. However, labor for premature fetus needs to be reconsidered due to its high association of a lower life expectancy. Conservative care can reduce perinatal morbidity and mortality although this delay in labor is actually a risk because maternal endothelial dysfunction will get worse and poor perfusion will continue which will cause potential damage to several organs such as the brain, liver, kidneys, placenta, fetus, and other vascular organs. The risk for the fetus are restriction of fetal growth and the possibility of fetal death due to uteroplacental disorders (Sibai, 2005).

Conservative care in severe preeclampsia is complicated but still needs to be done to get a better fetal outcome. Factors that influence the success of conservative care are estimated to be numerous and very complex. In this study, researchers wanted to evaluate several factors that might influence the success of conservative care of patients with severe preeclampsia who were treated in Obstetric Ward Dr. Soetomo General Hospital.

Method

Research Type and Design

This research is a cross sectional descriptive study using secondary data

from morning report data, maternity room registers, and medical record data at dr. Soetomo General Hospital during 2018-2019

Population and Research Samples

We performed total sampling in this research. The inclusion criteria is pregnant women with severe preeclampsia who underwent conservative treatment, while those whose pregnancy were directly terminated upon admission we excluded. The population and sample of this study were all pregnant women with severe preeclampsia who were treated conservatively in the Obstetric Ward dr. Soetomo General Hospital during 2018-2019.

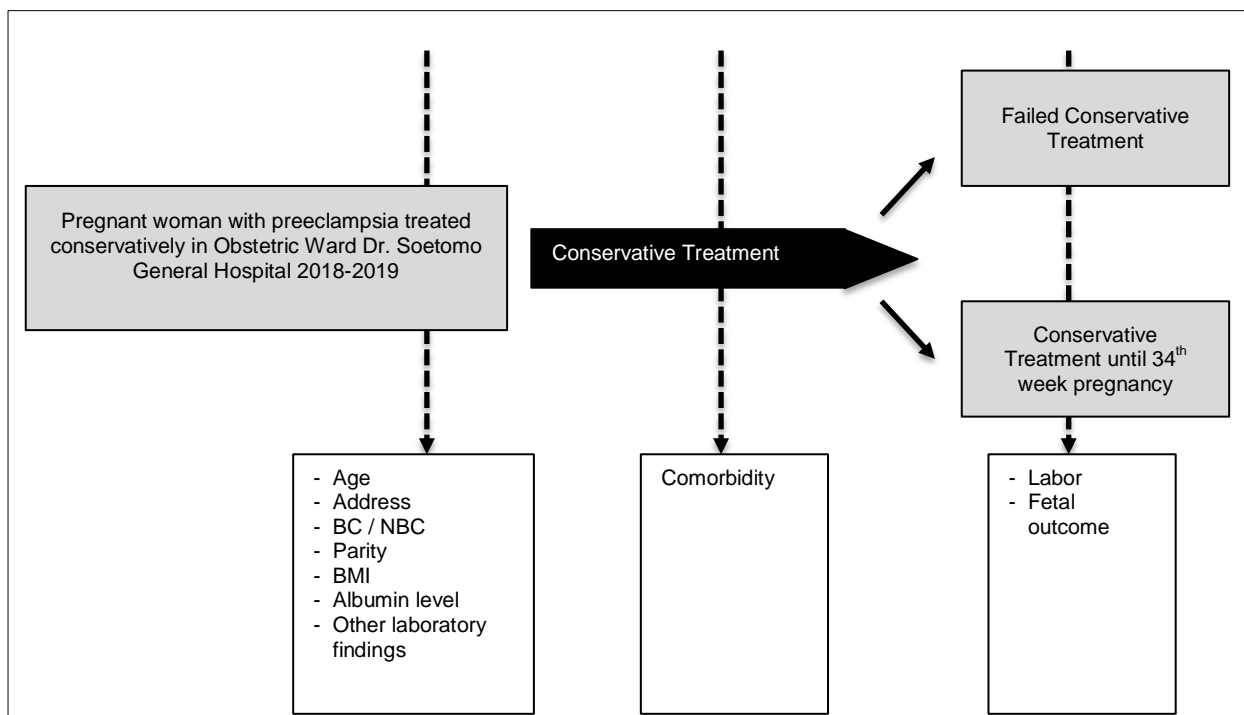


Figure 1. Methodological pathway. Pregnant women who were admitted to delivery room are divided into those who underwent conservative treatment and those who are delivered immediately. We gather the data of those treated conservatively and filling the demographic and laboratory data afterwards we assess the outcome and mode of delivery at the end of the conservative treatment period.

Ethical clearance was assessed and approved by the ethics committee of the dr. Soetomo General Hospital.

Results And Discussion

Number of severe preeclampsia cases treated conservatively in the Obstetric Ward of Dr. Soetomo General Hospital

Table 1. Cases of severe preeclampsia treated conservatively in the Obstetric Ward of Dr. Soetomo General Hospital

Year	Conservative Preeclampsia	Preeclampsia	Total Labor
2018	51	379	1454
2019	69	481	1345

Characteristics of pregnant women with severe preeclampsia who are treated conservatively

Table 2. Characteristics of Pregnant Women with Severe Preeclampsia who are treated Conservatively

	Failed Conservative Preeclampsia		Conservative Preeclampsia until 34th weeks pregnancy	
	Case	%	Case	%
Mother's age				
< 16	-	-	-	
17-19	1	1,47 %	1	1,92%
20-34	45	66,18%	29	55,77%
≥ 35	22	32,25%	22	42,31%
Mean of Age	31.176		31.904	
Gravid				
Primi Gravida	22	32,25%	20	38,46%
Multi Gravida	46	67,65%	32	61,54%
Book Case / Non Book Case				
Book Case	5	7,35%	-	
Non Book Case	63	92,65%	52	100,00%
Surabaya / Outside Surabaya				
Surabaya	51	75,00%	41	78,85
Outside Surabaya	17	25,00%	11	21,15%
	Failed Conservative Preeclampsia		Conservative Preeclampsia until 34th weeks pregnancy	
	Case	%	Case	%
Race				
Javanese	47	69,12%	41	78,85%
Maduranese	17	25,00%	7	13,46%
Others	4	5,88%	4	7,69%

Comorbidity				
Chronic HT	24	35,29%	19	36,54%
Previous SC	18	26,47%	8	15,38%
Secondary Primi	7	10,29%	6	11,54%
Gestational Diabetes	2	2,94%	5	9,62%
Pragestational Diabetes	2	2,94%	-	
Gemelli	8	11,76%	1	1,92%
Anemia	7	10,29%	3	5,77%
HELLP Syndrome	4	5,88%	-	
Asthma	2	2,94%	4	7,69%
HbsAg	3	4,41%	1	1,92%
HIV	2	2,94%	-	
Cardiomyopathy	2	1,47%	-	
Cardio-valvular Disease	1	1,47%	1	1,92%
Placenta Previa	2	2,94%	1	1,92%
Body Mass Index				
< 18,5	1	1,47%	-	
18,5-24,9	10	14,71%	7	13,46%
25-29,9	20	29,41%	13	25,00%
30-34,9	20	29,41%	16	30,77%
35-39,9	8	11,76%	6	11,54%
≥ 40	9	13,24%	10	19,23%
Albumin				
< 3	18	26,47%	6	11,54%
3 – 3,49	33	48,53%	26	50,00%
≥ 3,5	17	25,00%	20	38,46%
Platelet				
< 100.000	2	2,94%	-	
100.000 – 150.000	5	7,35%	4	7,69%
≥ 150.000	61	89,71%	48	92,31%
Creatinine Serum				
≤ 1,1	64	94,12%	51	98,08%
> 1,1	4	5,88%	1	1,92%
Duration of Treatment				
1 – 14 days	46	67,65%	27	51,92%
> 14 days	22	32,35%	25	48,08%
Mean of Duration	13.250		19.942	
Mode of Delivery				
Vaginal	13	19,12 %	9	17,31%

Abdominal	55	80,88 %	43	82,69%
	Failed Conservative Preeclampsia		Conservative Preeclampsia until 34th weeks pregnancy	
	Case	%	Case	%
Baby Birth Weight				
< 500	4	5,62 %	-	-
500 – 1000	18	23,68 %	-	-
> 1000 – 1500	23	30,26 %	5	9,43%
> 1500 – 2000	22	28,95 %	23	43,40%
> 2000 – 2500	8	10,53 %	20	37,74%
> 2500	1	1,32%	5	9,43%
APGAR Score at 5th minutes				
0-3	22	28,95%	-	
4-6	12	15,79%	3	5,66%
7-10	42	55,26	50	94,34%
IUGR		11 (12 fetus) 16,18 %		4 7,69%
IUFD		10 (12 fetus) 14,71 %		-

Termination indication in severe preeclampsia cases with prior conservative treatment

Table 3. Termination indication in severe preeclampsia cases with prior conservative treatment

Termination Indication		
Impending Eclampsia	23	33,82%
Abnormal NST	12	17,65%
IUGR	10	14,71%
IUFD	6	8,82%
Uncontrolled HT	4	5,88%
In Labor	4	5,88%
Premature Rupture of Membrane	4	5,88%
Fetal Distress	1	1,47%
Placental Abruption	1	1,47%
Eclampsia	1	1,47%
Placenta Previa Totalis + Active Bleeding	1	1,47%
Non survival fetus	1	1,47%

Discussion

The majority of patients with severe preeclampsia who were both successful and unsuccessful conservatively treated until 34 week in obstetric ward dr. Soetomo General Hospital were patients with age range 20-34 years old, multigravida, non-booked case, and derived from Surabaya. Age range 20-34 accounts for the majority of patients due to productive age. Most of the cases were non-booked cases due to referral cases and the patient would get immediate action or be hospitalized if the patient manifested symptoms of severe preeclampsia. The majority of patients were from Surabaya, patients from other regions would have been treated by other regional hospitals.

In a study by Vahid Roudsari et al. BMI was reported to be 24 kg/m² in the pre-pregnancy control group, 26.124 kg/m² in the gestational hypertension group, 26.24 kg/m² in the group with mild preeclampsia and 26.24 kg/m² in the severe preeclampsia group. Jang et al. in Seoul, Korea, compared two groups and showed that the incidence of preeclampsia in women with overweight women is higher than those of normal weight. Derif et al. also stated that hypertension problems occurs more in overweight women indicating its incidence 7% to 17% (Roudsari, 2009).

In terms of ethnicity, the majority patients were Javanese. This is reasonable because the majority of East Java's population is Javanese. The interesting result from this study was the proportion of Maduranese in unsuccessful conservative treatment was bigger than the successful one.

From body mass index aspect, it was found that the majority of conservative

treatment patients were obese (BMI is more than 30 kg/m²). The distribution of body mass index was almost the same in the successful and unsuccessful treatment group. In the study by Ohkuchi et al. the incidence of hypertension during pregnancy in women with less weight, normal weight, weight more than normal, and obese was 1.1%, 1.8%, 5.8%, and 19.6%, respectively, which indicates that the incidence of pre-pregnancy hypertension in obese women significantly increases (Ohkuchi A, 2006).

The majority of patients treated conservatively had low albumin level (below 3.5 g / dL). It was found in this study that the percentage of patients with normal albumin levels was higher in the conservative treatment group compared to the unsuccessful conservative treatment group. This could occur because albumin level reflects the nutritional status of patients. If the patient had a better albumin level, she would have a better nutritional status which in turn had a better prognosis as well.

There have been only a few studies regarding maternal serum albumin level as a severity predictor of preeclampsia. Brown et al. low serum albumin levels were significantly associated with severe preeclampsia and perinatal mortality, although not all studies supported this claim (Brown MA, 1996). According to Gojnic et al. serum albumin levels were correlated with severity of preeclampsia and all patients with severe preeclampsia had values <3.0 g/ dL, further he stated that hypoalbuminemia can be identified as an early sign in developing preeclampsia (Gojnic M, 2004).

In this study it was also found that the duration of conservative treatment were mostly less than 14 days and most of the

pregnancies were terminated with cesarean section with majority fetal weight less than 2000 grams. As one of the complications of severe preeclampsia, there were cases of fetal growth restriction in unsuccessful and successful conservative treatment group as much as 16 and 8 percent respectively. The fetal death accounted for 10 percent as the most severe complication. The biggest reasons for failure of conservative care in this study were impending eclampsia, abnormal NST, and Fetal Growth Restriction.

Conclusion

Severe preeclampsia cases which treated conservatively in Obstetric Ward of dr. Soetomo General Hospital in 2018 and 2019 is 51 and 69 cases respectively. Most of the patients were obese (Body Mass Index more than 30 kg/m²). The distribution of body mass index in successful and unsuccessful conservative treatment group results were almost similar. The majority of patients treated conservatively had lower than normal albumin levels (below 3.5 g/dL). It was also seen that patients in conservative treatment group had higher percentage of normal albumin levels compared to the unsuccessful conservative group which did not reach 34 weeks. Patients with better albumin levels are thought to have better nutritional status thus have a better prognosis.

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