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RESEARCH

Differences of Hemostasical Factors in Severe Preeclampsia And Eclampsia

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Abstract

Objective : To find the difference in mean hemostatic factors in severe preeclampsia and eclampsia.

Method : The study was analytic descriptive using a cross sectional study design by looking at the subject's Medical Record according to the time and place of research. The sample is the entire medical record of pregnant women who suffer from preeclampsia and eclampsia in the obstetric and gynecology departments of Dr. M. Djamil Padang Hospital in the period 15 January 2016 to 31 December 2017. The assessment was in the form of assessed platelet levels, PT, APTT and D-Dimer. Samples were taken from populations that met the inclusion criteria and did not have exclusion criteria. Sampling using consecutive sampling techniques taken from the Medical Record Dr. M.Djamil Padang. Statistical analysis to assess significance using the T-Test.

Result : The severity the condition of pregnancy the lower the platelet mean and PT. Significant differences were obtained between platelets in PEB and eclampsia (p> 0.05). The mean PT, APTT and D-Dimer showed no significant differences in pregnancy conditions. Statistical test with T-Test did not show significant differences in mean PT, APTT, and D-dimer between eclampsia and PEB (p> 0.05).

Conclusion : There were significant differences in mean in platelets, whereas in PT, APTT, and D-dimers in PEB and eclampsia there were no significant differences.

Keywords: *Pregnancy, severe preeclampsia, eclampsia, platelets, PT, APTT, D-Dimer.*

INTRODUCTION

Preeclampsia is defined as a condition of hypertension and proteinuria after 20 weeks' gestation. Preeclampsia is a major pregnancy complication whose incidence is increasing worldwide and is associated with maternal morbidity and mortality. In hypertension in pregnancy, both pure and superimposed preeclampsia and eclampsia are the most dangerous complications.[1] Preeclampsia and eclampsia are the cause of 30-40% of perinatal deaths in Indonesia.[2]

The incidence of preeclampsia ranges from 5-15% of all pregnancies worldwide. At Cipto Mangunkusumo Hospital in Jakarta 400-500 cases / 4000-5000 labor per year were found. In Indonesia the incidence ranges from 7-10%. Research conducted at Dr. RSUP M. Djamil in
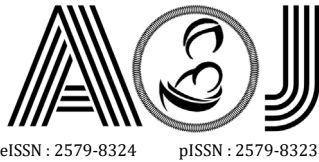
1998-2002, the incidence of preeclampsia was 5.5% and eclampsia was 0.88% from 12,034 deliveries. During the period of January 1, 2005 to December 31, 2007 at BLU Dr. M. Djamil Padang found 220 patients (4.99%) in preeclampsia and 47 eclampsia (1.07%) from 4407 deliveries. 2 From the medical record data of RSUP Dr. M. Djamil Padang in 2010 there were 113 cases of severe preeclampsia (PEB) with 2 cases of death, 1 case died due to disseminated intravascular coagulapathy (DIC) and 1 case died due to intracerebral hemorrhage (PIS). Then there were 37 cases diagnosed as eclampsia with 3 cases of death, 2 cases died due to DIC and 1 case died due to PIS. So in 2010 there were 5 cases of death, 3 people died due to DIC and 2 people died due to PIS. From the data above it was found that there were 60% of cases of death due to DIC in preeclampsia and eclampsia in 2010.

In severe preeclampsia or eclampsia, one of the acute worsening of life to the mother and baby is coagulopathy or DIC. In DIC, the clotting process occurs simultaneously with the occurrence of bleeding due to fibronolysis. Because in DIC there is coagulopathy and is a progressive condition, so that early diagnosis, treatment and appropriate management are needed to reduce maternal and infant mortality and other complications.[3]

The science of preeclampsia is highly developed and the incidence of eclampsia and preeclampsia in pregnant women is enormous. Plus from the data that states that complications of preeclampsia that cause most deaths is DIC which is a disease associated with coagulation factors during pregnancy. For this reason, it is important to know how far hemostasis factors such as platelets, PT, APTT and D-Dimer are affected in patients with severe preeclampsia and eclampsia for early diagnosis.

METHOD

This research is a descriptive analytic study with cross sectional study design. This study was to determine the differences in the mean hemostatic factors (platelets, PT, APTT, and D-dimers) in patients with severe preeclampsia and eclampsia at Dr. RSUP. M. Djamil Padang starts from January 15, 2016 until December 31, 2017. This study was conducted by looking at the status of the subject's medical record prospectively according to the time and place of study.

The study population was all medical records of pregnant women who suffer from preeclampsia and eclampsia in the Obstetrics and Gynecology Section of RSUP.DR.M.Djamil Padang in the period 15 January 2016 to 31 December 2017. Samples in the study were all populations that met the inclusion criteria and there were no criteria exclusions taken by consecutive sampling technique. Secondary data were collected from medical records in the Medical Records Section of the General Hospital. Dr. M.Djamil Padang with independent variables Thrombocyte levels, PT, APTT and D-Dimer. The dependent variable is the incidence of preeclampsia and eclampsia. Data processing in this study uses the SPSS (Statistical package of Social Science) version 16.0 program which was analyzed by T-Test.
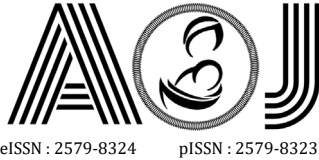
RESULT

From 60 samples that met the inclusion criteria, the following study subjects characteristics were obtained. In the PEB pregnancy group and eclampsia, the mean age was 29.41 ± 3.93 years and 28.57 ± 5.11. In the Severe preeclampsia and Eclampsia groups, multipara parity respondents had the highest respondents (66.67% and 76.2%). Preterm gestational age had high respondents in the PEB and Eclampsia groups (61.53% and 66.67%).

Table 1 Distribution of Subject Characteristics

		Severe Preeclampsia n = 39	Eclampsia n = 21
Age		29,41 ± 3,93	28,57 ± 5,11
Parity	Nullipara	13 (33,33%)	5 (23,8%)
	Multipara	26 (66,67%)	16 (76,2%)
Gestasional age	Preterm	24 (61,53%)	14 (66,67%)
	Term	15 (38,47%)	7 (33,33%)

The average platelet level according to the condition of pregnancy can be seen in table 2. The tendency that the more severe the condition of pregnancy, the lower the platelet average decreases; the difference was statistically significant (p <0.05).

Table 2 Mean Platelets level by Pregnancy Conditions

| Pregnancy Condition	Mean (sb)	p-value*	Mean Differences (Cl 95%)
Severe preeclampsia (n=39)	204717,1 (105929,954)	0,00	92146,52 (56082,93 - 128210,1)
Eclampsia (n=21)	112571,43 (26452,953)		

*independent sample t-test

The mean prothrombin time (PT) according to the conditions of pregnancy can be seen in table 3, there is a tendency that the heavier the pregnancy condition is, the lower the mean value of PT, but statistically the difference is not significant (p> 0.05).

Table 3 Mean PT according to pregnancy conditions

Pregnancy Condition	Mean (sb)	p-value*	Mean Differences (Cl 95%)
Severe preeclampsia (n=39)	9,30 (1,236)	0,374	0,319 (-0,399 – 1,037)
Eclampsia (n=21)	8,98 (1,349)		

*independent sample t-test

The mean value of Activated Protrombin Time (APTT) according to the condition of the pregnancy can be seen in table 4, the more severe the condition of pregnancy the higher the mean APTT, statistically the difference was not significant (p> 0.05).
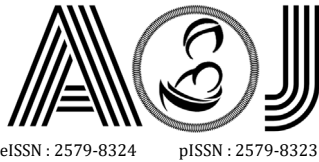
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Table 4 Mean Activated Protrombin Time (APTT) according to pregnancy conditions

Pregnancy Condition	Mean (sb)	p-value*	Mean Differences (Cl 95%)
Severe preeclampsia (n=39)	32,7 (6,697)	0,401	1,275 (-3,63 – 1,47)
Eclampsia (n=21)	33,15 (3,159)		

*independent sample t-test

Mean of D-Dimer levels according to the conditions of pregnancy can be seen in Table 5 The more severe the conditions of pregnancy the higher the D-Dimer mean value, statistically the difference was not significant (p> 0.05).

Table 5 Means of D-Dimer Value according to Pregnancy Conditions

| Pregnancy Condition	Mean (sb)	p-value*	Mean Differences (Cl 95%)
Severe preeclampsia (n=39)	2967,93 (1768,50)	0,09	-1063,54 (-22910,285 – 164,204)
Eclampsia (n=21)	4031,47 (2436,77)		

*independent sample t-test

DISCUSSION

This study was conducted in the Obstetrics and Gynecology Section of RSUP.Dr.M.Djamil Padang hospital during the period of January 15, 2016 until December 31 2017 against 60 patients as research and control subjects. The study was analytic descriptive using a cross sectional study design by looking at the medical records of subjects according to the time and place of research. The sample is the entire medical record of pregnant women who suffer from preeclampsia and eclampsia in the Obstetrics and Gynecology Section at Dr. RSUP. M. Djamil Padang. Data taken in the form of platelet levels, PT, APTT and D-Dimer.

Statistically seen the tendency that the more severe the condition of pregnancy the decreasing platelet mean number based on the T-Test was statistically significant (p <0.05). According to the literature it is stated that the decrease in platelet count in preeclampsia is related to endothelial damage in all blood vessels where platelets are used as the primary mechanism of the hemostasis system.[4] The process of disruption of hemostasis can cause multiple organ failure, in which the activation of massive clotting factors can lead to a decrease in platelet counts and coagulation factors so that bleeding / consumption coagulopathy occurs.[5] In pregnant women with preeclampsia / eclampsia the platelet count will be lower than women pregnant normal condition.

From this description it can be understood that there is relevance between the severity of the condition of pregnancy with the degree of endothelial damage.

Statistically, it seems that the more severe the condition of pregnancy, the shorter the mean PT value, but statistically the difference is not significant (p> 0.05). PT is part of the mechanism of secondary hemostasis through the extrinsic pathway in which endothelial damage that continues to occur in patients with preeclampsia will trigger activation of the
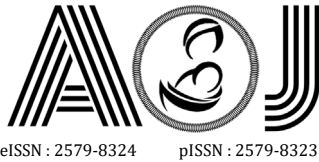
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pathway, at an early stage it will be seen as a tendency to shortened PT values. Activation of the extrinsic pathway is triggered by trauma to the tissue structure or against the walls of blood vessels.[6] So it can be concluded that there is relevance between the severity of the condition of pregnancy with the degree of endothelial damage and also acts as a cause of the occurrence of hypercoagulable state in the hemostasis system.

The mean APTT value shows that the more severe the condition of pregnancy, the higher the APTT mean value, statistically the difference is not significant (p> 0.05). Endothelial damage in preeclampsia that occurs will lead to activation of the intrinsic pathway which will be seen as an elongated APTT value. The intrinsic pathway is initiated by trauma to the blood cells themselves, or exposed to collagen walls of blood vessels that cause this pathway to be activated.[6] The APTT value varies according to the severity of the progression of preeclampsia itself and may be prolonged in the final process when the clotting factor drops very low. [7]

Based on these data, the APTT value can be used as an indicator of the tendency for eclampsia. This change toward the APTT value tends to be elongated showing that the intrinsic pathway has no role in the hypercoagulable state but has a tendency towards DIC. This change in APTT value can also be used as a reference in recognizing DIC earlier in preeclampsia so that patients will not enter coagulopathy consumtion.

The mean value of D-Dimer shows that the more severe the condition of pregnancy, the higher the mean value of D-Dimer, statistically the difference is not significant (p <0.05). This increase in D-Dimer is a description of the amount of thrombus that occurs due to the process of fibrinolysis to control so that coagulation activity is not excessive, Plasmin causes degradation of fibrin, increases the amount of dissolved fibrin degradation products, high levels indicate the presence of a lot of thrombus in the blood.[7] This can explain the mechanism damage to preeclampsia in which tertiary hemostasis due to fibrinolysis plays an important role in the response to endothelial damage so that coagulation activity is not excessive.[4]

From this description it can also be understood that the more severe the condition of pregnancy, the higher the level of thrombus in the blood due to activation of the clotting cascade through extrinsic and intrinsic pathways where platelets are the main ingredients that form thrombus.

CONCLUSION

In this study it can be concluded that there is a tendency to decrease the average platelet count based on the statistically more severe pregnancy conditions meaningful, there is a tendency to shorten the mean PT value based on the increasingly severe conditions of pregnancy but statistically not significant. The mean value of APTT with pregnancy conditions was not significant between peb with eclampsia and the mean D-Dimer level in PEB with eclampsia was statistically not significant.
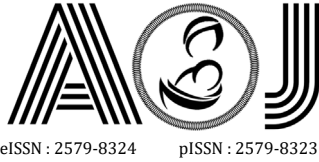
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