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Original Article

COMPARISON IMMUNOHISTOCHEMISTRY EXPRESSION OF DESIDUAL NATURAL KILLER (dNK) IN SEVERE PREECLAMPSIAAND NORMAL PREGNANCY

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ABSTRACT

Objective: Preeclampsia characterized systematically by extensive vascular endothelial dysfunction and microangiopathy on mother, dNK is very important for the success of placentation. They are the key mediator of maternal immune system interactions with fetal cells. dNK cells are also involved in the modulation of EVT and the remodeling of spiral arteries.

Methods: Analytic research with cross-sectional study, with samples of pregnant women who suffer from severe PE and aterm pregnancy which came to H. Adam Malik Hospital and Networking Hospital, November 2015-April 2016. The samples are 46 women, who met the inclusion criteria.

Results: Immunohistochemistry examination dNK cell in the severe PE case group and control group, statistically found p<0,05. dNK placenta expression in the severe preeclampsia case group gives an overview of expression with a mean of 2.55±2.31, while the control group of normal pregnancy had higher mean is 8.66±3.16.

Conclusion: The examination of immunohistochemistry of dNK cells showed there is a significant difference in the expression of Immuno-histochemistry dNK cells between severe PE case group and non severe PE.

Keywords: Severe preeclampsia, Normal pregnancy, Expression of dNK cell

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INTRODUCTION

Preeclampsia is systemically characterized by widespread vascular endothelial dysfunction and microangiopathy in the mother, but not in the fetus. At present it is believed that preeclampsia starts with abnormalities in the development of blood vessels in the placenta that cause an effect on the maternal endothelium [1, 4, 5].

Knowledge of cellular and molecular processes of human trophoblast invasion is based on *in vitro* research and animal models; there is evidence that decidual natural killer (dNK) cells are very important in successful placentation. They are key mediators of the interaction of the mother's immune system with fetal cells. DNK cells are also involved in modulation of invasion of extravillous trophoblasts (EVT) and remodeling of the maternal spiral arteries. They express various surface receptors and signaling molecules, including cytokines, chemokines, and growth factors, and their function in modulating EVT migration, invasion, and change from epithelial phenotype to endothelial are beginning to be revealed [6].

MATERIALS AND METHODS

This study is a comparative analytic study with a cross-sectional study design conducted at General Hospital. H. Adam Malik Medan, RSUD dr. Pirngadi Medan, and Faculty of Medicine, University of North Sumatra Networking Hospital from November 2015 to April 2016. The sample of the study was 23 pregnant women suffering from PEB and normal pregnant women with a term gestational age for each group who met the inclusion criteria, namely pregnant women aged 18-35 y, singleton pregnancy, severe preeclampsia, term and exclusion criteria ie damaged placenta samples; who came for pregnancy control to General Hospital H. Adam Malik Medan, RSUD dr. Pirngadi Medan, Faculty of Medicine, University of North Sumatra Networking Hospital.

Work arrangement

Taken in the middle of the maternal side opposite the insertion site of the umbilical cord on the fetal surface with a size of 1.5 x 1.5 x 1 cm. Then fixed in 10% formalin liquid with a time limit of 24-48 h, dried with ethanol and cleaned with xylol and implanted in a paraffin block. Paraffin is cut 7µm. Stained with Hematoxyclin and Eosin (H and E). Immunohistochemically stained for CD56 to detect dNK cells using CD56 anti antibodies. The preparations were interpreted by two Anatomical Pathologists. The results of the preparation of these preparations are carried out statistical analysis with Statistical Product and Service Solutions (SPSS) Ver. 18

RESULTS

Characteristics of research subjects

Table 1: Distribution characteristics of research subjects in severe preeclampsia case group and normal pregnancy group

Characteristics	Research subjects				Total	%	p value
	Severe preeclampsia	%	Normal pregnancy	%			
Age (years old)							
15-25	3	13	8	34,8	11	23,9	0,062**
26-35	16	69,6	15	65,2	31	67,4	
>35	4	17,4	0	0	4	8,7	
Parity							
Primigravida	7	30,4	5	21,7	12	26,1	0,611*

Secundigravida	6	26,1	9	39,1	15	32,6	
Multigravida	10	43,5	9	39,1	19	41,3	
Birth Weigth							
Low Birth Weight	5	21,7	0	,0	5	10,9	0,058***
Normal	18	78,3	23	100	41	89,1	
APGAR Score							
Good	23	100	23	100	46	100	
PROTEINURIA							
(+2)	9	39,1	0	0	9	19,6	
(+3)	11	47,8	0	,0	11	23,9	
(+4)	3	13,0	0	,0	3	6,5	0,001**
Negative	0	0	23	100	23	50	
Total	23	100	23	100	46	100	

*Chi-square test **Fisher Exact test ***Continuity Correction

Table 2: Differences in dNK cell expression between severe preeclampsia case group and normal pregnancy group

Research subjects	N	CD56 expressions		p value
		Mean	Std. deviasi	
Severe Preeclampsia	23	2,55	2,31	0,031
Normal Pregnancy	23	8,66	3,16	

Table 3: Differences in dNK cell expression between severe preeclampsia case group and normal pregnancy group based on Normal birth weigth and low birth weight (LBW)

Birth weight	N	CD56 expressions		p value
		Mean	Std. deviasi	
Normal	41	6,9451	5,20322	0,003
LBW	5	2,4000	2,00468	

Table 4: Differences in expression of dNK cells based on proteinuria

Research subjects	N	CD56 expressions		p value
		Mean	Std. deviasi	
Proteinuria				
Negative	23	9,6957	4,24997	
(+2)	9	3,8889	4,90075	0,001
(+3)	11	2,7045	2,93645	
(+4)	3	3,0000	3,46410	

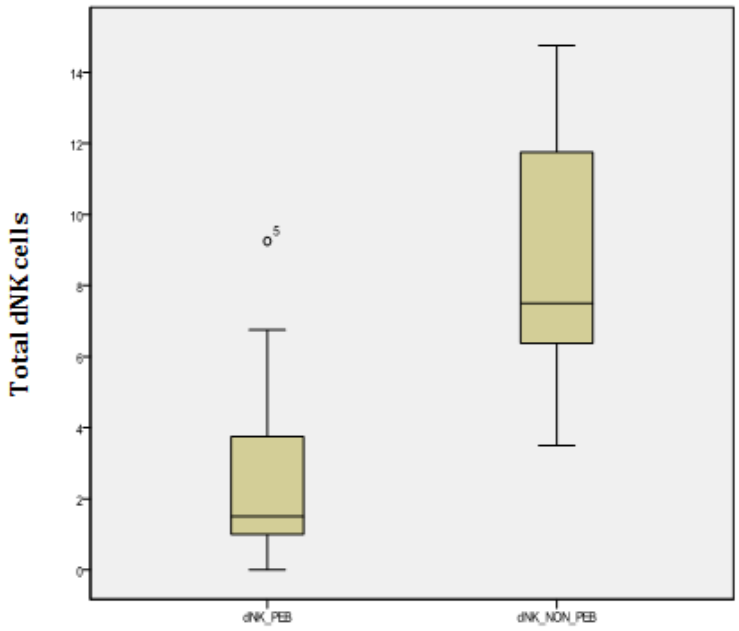

Fig. 1: Boxplot showing mean number of dNK cells in placenta with severe preeclampsia and normal pregnancy

DISCUSSION

Immunohistochemistry examination results

The results of this study found that the results of immune-histochemistry dNK cells examination in the severe preeclampsia case group generally gave a description of expression with a mean of 2.55±2.31 while in the normal pregnancy control group had a higher mean with 8.66±3.16. Statistically obtained p value<0.05 which indicates there is a significant difference in the expression of immunohistochemistry dNK cells between severe preeclampsia case group and normal pregnancy group.

In another study by Charles *et al.* stated that dNK cells in women with preeclampsia were significantly less than controls (normotension). Closely related between dNK cells and blood vessels, dNK cells trigger angiongenic factors on the effects of IFN-γ to facilitate remodeling of normal blood vessels [57, 70, 71]. Rieger *et al.* in their study found that there was a significant relationship between CD56+/CD16+dNK cell counts that increased in the normal pregnancy group than in severe preeclampsia group (7.3% vs 5.3%, p<0.02) [58]. Williams *et al.* Observed that CD56+NK cells (p = 0.01) decreased in placental bearing biopsies in PE pregnancy women compared to normal third trimester pregnancy [59].

CONCLUSION

Immunohistochemistry examination of dNK cell in severe preeclampsia case group generally gave a picture of expression with a mean of 2.55±2.31 while in the normal pregnancy control group had a higher mean with 8.66±3.16. Which showed significant differences in the expression of immunohistochemistry dNK cell between severe preeclampsia case group and normal pregnancy group.

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AUTHORS CONTRIBUTIONS

All the authors have contributed equally.

CONFLICT OF INTERESTS

There is no conflict of interest in this research.

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