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Nuclear

factor- \hat{B}

Nuclear

factor-ê B

2004 2

.



Nuclear factor- κ B

: NF- κ B p50 I κ B α
 lipid peroxide .
 : ,
 ,
 33
 () 21 ()
 , ,
 , Nuclear factor- κ B (p50)
 I κ B α , ,
 malondialdehyde
 Mann-Whitney test .
 :
 NF- κ B 가 (p<0.05). , ,
 가 . I κ B α
 가 .
 malondialdehyde 1.22 \pm 0.79 mol/ml
 0.41 \pm 0.12 nmol/ml 가

($P < 0.05$)

: NF- κ B

가 .

NF- κ B

가 .

: NF- κ B, , ,

	-----	1
	-----	3
	-----	4
	-----	5
I.	-----	6
II.	-----	8
A.	-----	8
B.	-----	8
1.	-----	8
2.	-----	9
3.	malondialdehyde assay -----	9
4.	-----	10
III.	-----	11
IV.	-----	14
V.	-----	19
	-----	20
	-----	23

Fig. 1. Immunohistochemical staining of NF- κ B (p50) -----13

Fig. 2. Immunohistochemical staining of I κ B α -----13

Table 1. Patient characteristics ----- 12

Table 2. Immunohistochemistry scoring system of NF- κ B----- 12

Table 3. Immunohistochemistry scoring system of I κ B α -----12

I.

3 20
, , 가 .¹
6-8 % .²

가 , 가

.³

NF- κ B p65 p50
, NF- κ B p65, p50
inhibitory factor- κ B (I κ B α , β) 가 가

I κ B가 p65 p50 DNA

.^{4,5}

. 6,7,8

NF- κ B ,

가 ,

NF- κ B p50 I κ B α

NF- κ B

II.

A.

33 ()

21 ()

20

140/90 mmHg

24

300mg

1+

dipstick

B.

1.

가 hematoxylin-eosin

2 tissue microarrayer (Petagen, Inc. Seoul. Korea)

1 mm 108

(tissue microarray)

..

2.

3 ì m

. NF-êB p50 IêBα (Santa Cruz Biotechnology Inc.
Santa Cruz, CA) . xylene

. Microwave peroxidase

3% H₂O₂ 10 . 1

phosphate buffered saline (PBS) .

streptavidin-biotin cap-plus detection kit (Zymed laboratories

Inc, San Francisco, CA) PBS diaminobenzidine

, mayer hematoxylin .

3. **malondialdehyde assay**

5 cc 가 5000 rpm 5

70 . 1

ml 8.1 % sodium dodecyl sulfat 0.1 ml, 20 % sodium acetate (pH 3.5) 0.8 %

TBA 0.5 ml 0.15 ml 95 1 가 2.5 ml
n-butanol/pyridine(15:1,v/v) 0.5 ml 가 .
3,000 g 10 532 nm

4.

(syncytiotrophoblast), (cytotrophoblast), ,
(extravillous cytotrophoblast),
, NF- κ B(p50) , I κ B α
. 0-4
, 0 , 1 20% 가 ,
2 70 % , 3 70 % , 4
70 %

mean HSCORE (HSCORE = $\sum_{i=0}^4 P_i[i+1]$, $i=0,1,2,3,4$. P_i
) mean \pm SD . SPSS for
windows 11.5 Mann-Whitney test P 0.05

III.

가 , 가
37.4 ± 2.5 , 33.1 ± 2.8
가 , 3393 ± 594 g, 2358 ±
1058 g 가 (Table 1).

0.41 ± 0.12 nmol/ml
1.22 ± 0.79 nmol/ml 가
(P<0.05) (Table 1).

가 .
NF-êB
가가
(p<0.05) (Fig. 1).

가가 가 ,
(Table 2).

IêBα ,
(Fig. 2).

가 (Table 3).

Table 1. Patient characteristics

	Normal (n=21)	Preeclampsia (n=33)	P-value
Age (years)	31.7 ± 3.9	31.8 ± 5.0	.679
Gravida	3.1 ± 1.4	2.9 ± 2.0	.394
Para	1.1 ± 0.7	0.8 ± 0.8	.125
Gestational age (weeks)	37.4 ± 2.5	33.1 ± 2.8	<.05
Birth weight (gm)	3393 ± 594	2358 ± 1058	<.05
Malondialdehyde (nmol/ml)	0.41 ± 0.12	1.22 ± 0.79	<.05
Mean ± SD			

Table 2. Immunohistochemistry scoring system of NF-kB

	Normal (n=21)	Preeclampsia (n=33)	P-value
Syncytiotrophoblast	1.4 ± 0.5	1.3 ± 0.7	.070
Cytotrophoblast	2.7 ± 0.8	3.0 ± 1.0	.213
Endothelium	2.5 ± 0.7	3.0 ± 0.8	.071
Extravillous cytotrophoblast	2.2 ± 0.6	4.3 ± 0.9	<.05
Decidua	4.6 ± 0.7	4.8 ± 0.4	.451
Mean ± SD			

Table 3. Immunohistochemistry scoring system of IκB

	Normal (n=21)	Preeclampsia (n=33)	P-value
Syncytiotrophoblast	4.4 ± 0.8	4.2 ± 0.6	.224
Cytotrophoblast	4.1 ± 0.7	3.9 ± 0.7	.442
Endothelium	4.4 ± 0.5	4.6 ± 0.5	.206
Extravillous cytotrophoblast	4.3 ± 0.5	4.4 ± 0.6	.397
Decidua	4.4 ± 0.6	4.5 ± 0.6	.260
Mean ± SD			

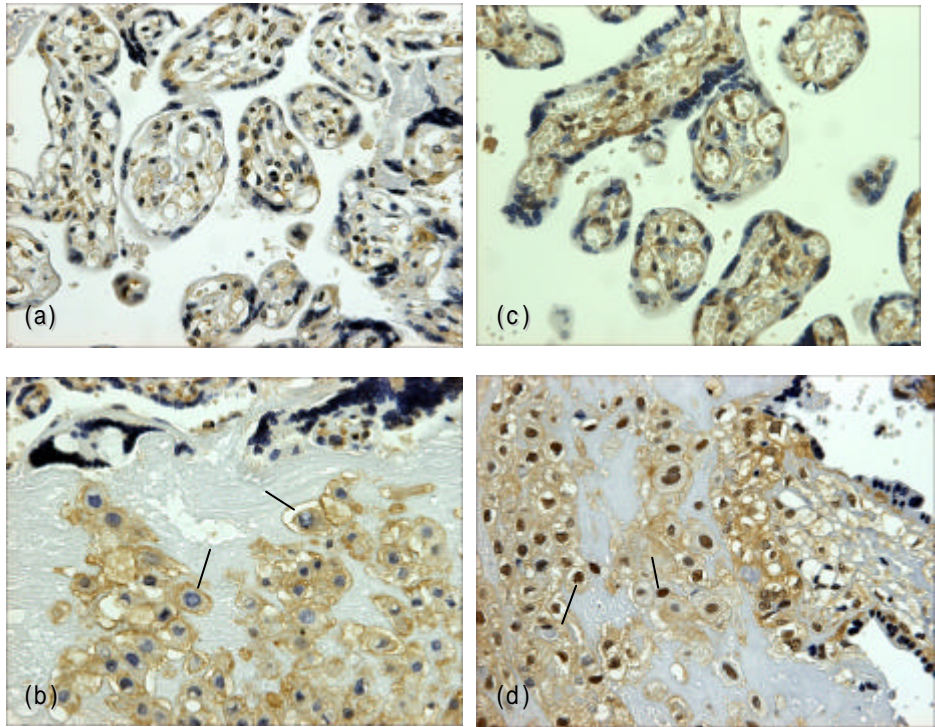


Fig. 1. Immunohistochemical staining of NF-kB (p50). (a) & (b) normal placenta; (c) & (d) preeclamptic placenta. Intense p50 nuclear staining (brown color) was seen within the extravillous cytotrophoblast of placenta from preeclamptic pregnancy compared with normal pregnancy (arrow). In cytotrophoblasts, syncytiotrophoblasts and endothelium, there was no difference between two groups. (x 400)

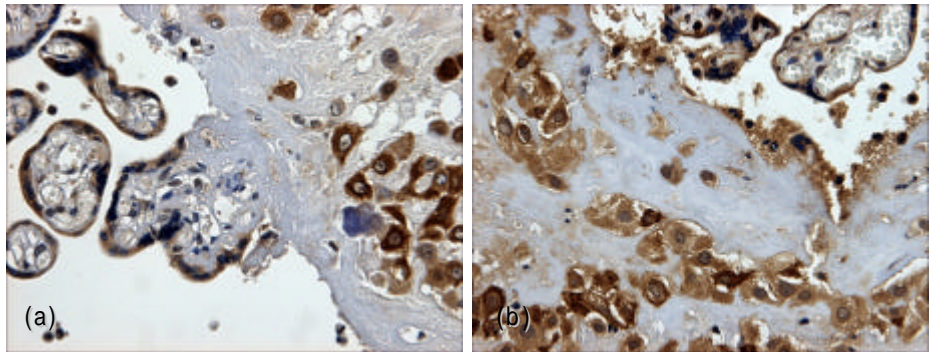


Fig. 2. Immunohistochemical staining of I&B̂. (a) normal placenta; (b) preeclamptic placenta. Intense cytoplasmic staining of I&B̂ was shown in both groups. (x 400)

IV.

, ,
1
, ,
, ,
가

1,2
가

9
가
- , ,

10
가 ,
11
가

가 .¹²

가 13

가 .¹⁴

가 .

가

xanthine dehydrogenase xanthine oxidase

.¹⁵ elastase

malondialdehyde .¹⁶

가 가

.¹⁷

TxA₂ 가 .¹⁸ prostaglandin H

synthase prostacyclin synthetase .

가 vascular prostacyclin TxA₂

nitric oxide synthetase

.¹⁹ endothelial plasminogen activator

inhibitor-1 가 antithrombin endothelial tissue plasminogen

activator cholesterol, oxidized fatty acid,

low- density lipoprotein 가

malondialdehyde

가

²⁰

가

가 가

NF-êB

가

. Takacs ²¹

가

NF-kB

가 , E

. Wallukat ²²

angiotensin-1

가 (angiotensin-1 autoantibody)가

, 가 Dechend ²³ angiotensin II 가 가

NADPH oxidase

NF-kB

NF-êB

가

가 가

I κ B

Yan²⁴

가

가

I κ B

가

가

2

2

NF- κ B

가

NF- κ B

가

가 NF-êB

NF-êB

가

.

V.

NF-êB

가

가

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- ABSTRACT -

The Expression of Nuclear Factor- κ B in the Placental Tissue with Preeclampsia

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Purpose: The aim of this study is to ascertain the differences in NF- κ B activity between the placental tissues of preeclampsia and normal pregnancy, and to certify that the circulating lipid peroxides is increased in preeclamptic women.

Material & Methods: Placental tissues were obtained from preeclamptic (n=33) and normal pregnancies (n=21) with no other medico-surgical illness or obstetric complications, delivered by cesarean section who did not undergo labor. The activities of NF- κ B and I κ B α on syncytiotrophoblast, cytotrophoblast, endothelium, extravillous cytotrophoblast, and decidua were separately measured by immunohistochemical staining using tissue microarray technique, then compared. Malondialdehyde assay was used to evaluate the oxidative stress, measuring lipid peroxide levels on each sample. Mann-Whitney test was done for statistical analysis of the data.

Results: Nuclear staining of NF- κ B(p50) was seen more intensively within the extravillous cytotrophoblast of preeclampsia group compared with the control group(p<0.05). The activity of NF- κ B(p50) was also detected in cytotrophoblasts, syncytiotrophoblasts, endothelium, and decidua, but showing no statistical difference

between two groups. I κ B α was strongly detected in both groups with no statistical significance. Preeclamptic group had significantly increased circulating lipid peroxide levels compared to normal pregnancy group, demonstrated by higher concentration of plasma malondialdehyde(1.22 ± 0.79 nmol/ml vs 0.41 ± 0.12 nmol/ml, $p < 0.05$).

Conclusion: The expression of NF- κ B is significantly increased in extravillous cytotrophoblast of preeclamptic women compared to normal pregnancy, and may be associated with increased levels of circulating lipid peroxide. These findings might help us to understand the pathologic mechanism of preeclampsia and further study should be done about functions of NF- κ B on implantation.

Keywords: NF- κ B, Preeclampsia, Placenta and extravillous trophoblast