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**Serum Levels of Oxygen-Derived Free Radicals
in Patients with Acute Pancreatitis**

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Background/Aims: The generation of oxygen-derived free radicals has been implicated in the pathogenesis of experimental pancreatitis. The aim of this study was to determine the role of oxygen-derived free radicals in patients with acute pancreatitis. **Methods:** The serum levels of CRP, lipid peroxide (LPO), myeloperoxidase (MPO) and superoxide dismutase (SOD) were measured in 13 patients with acute pancreatitis and 14 healthy volunteers. **Results:** The serum levels of LPO and MPO were higher and the activity of SOD was lower in patients with acute pancreatitis than controls. The serum levels of LPO and MPO showed higher tendency in the patients with severe pancreatitis than in patients with mild pancreatitis. However, there was no significant difference in the serum marker of oxidative stress according to the etiology. The LPO level was especially correlated with the concentration of serum CRP and CT severity index. **Conclusions:** The oxygen-derived free radicals may be closely associated with inflammatory process and the severity of acute pancreatitis. Especially, the concentration of serum LPO is meaningful as an index for severity of the disease. **(Kor J Gastroenterol 2000;35:621 - 628)**

Key Words: Oxygen-derived free radical, Acute pancreatitis, Lipid peroxide

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(oxygen-derived free radical)

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1997
(HMP-97-M-2-0021)

index) , 가 (Table 1).

가 Atlanta Classification

2.

3) 4 (31%), 5 (38%), 1 (8%), 3

\pm (23%) ,

chi-square test

independent sample t-test , p 0.05

CRP, MPO, LPO SOD

(p=0.296, 0.385, 0.689, 0.171)(Table 2).

3. (Atlanta clas-

sification, CRP, CT severity index)

1.

LPO MPO

21.9 \pm 26.5 12.3 \pm 11.7 nmol/mL

5.7 \pm 1.7 2.7 \pm 1.2 nmol/mL

(p=0.030, 0.005),

가 SOD

48.2 \pm 41.4 U/dL

100.4 \pm 20.2 U/dL (p=0.002),

SOD가

13 Atlanta Classification

(mild group) 8 (62%),

(severe group) 5 (38%) ,

(Table 3).

CRP 가 12.3 \pm 9.0 mg/dL

6.7 \pm 4.5 mg/dL 2 가

(p=0.311), SOD

Table 1. Laboratory Parameters in Patients with Acute Pancreatitis and Control Group

Parameters	Control (n=14)	Acute pancreatitis (n=13)	p-value
Amylase (IU/dL)	141.9 \pm 179.3*	393.3 \pm 243.1	0.005
LPO (nmol/mL)	5.7 \pm 1.7	21.9 \pm 26.5	0.030
MPO (nmol/mL)	2.7 \pm 1.2	12.3 \pm 11.7	0.005
SOD (U/dL)	100.4 \pm 20.2	48.2 \pm 41.4	0.002

* Datas are expressed as mean \pm standard deviation.

Table 2. Laboratory Parameters according to the Etiology of Acute Pancreatitis

Parameters	Gallstone group (n=5)	Alcohol group (n=4)	p-value
Age (years)	55.4 \pm 19.7	44.5 \pm 14.2	0.368
Amylase (IU/dL)	364.6 \pm 271.9	366.5 \pm 252.5	0.992
Lipase (IU/dL)	10004.0 \pm 15873.2	6035.8 \pm 8265.2	0.646
CRP (mg/dL)	6.0 \pm 2.5	12.3 \pm 9.8	0.296
LPO (nmol/mL)	15.6 \pm 10.5	38.7 \pm 45.1	0.385
MPO (nmol/mL)	11.3 \pm 15.3	15.5 \pm 14.3	0.689
SOD (U/dL)	59.2 \pm 49.3	21.0 \pm 17.1	0.171

Table 3. Clinical Characteristics of Patients with Acute Pancreatitis Classified according to Atlanta Classification

	Mild group	Severe group
No. of cases	8	5
Age (years)	53.5 ± 17.1	53.8 ± 15.7
Sex (M:F)	7 : 1	5 : 1
Etiology		
gallstone	2	3
alcohol	2	2
others*	4	0
No. of mortality	0	0

* One case was due to hyperlipidemia and 3 cases were idiopathic.

27.3 ± 15.4 U/dL		65.7 ± 49.2
U/dL		
(p=0.130).	LPO	MPO
	38.7 ± 38.1	20.1 ± 16.1
nmol/mL	11.5 ± 6.8	7.5 ± 4.1
nmol/dL		(
p=0.068, 0.053).		
CT severity index		
(Table 4).	가	
CRP		CT
severity index		
LPO	가	가

Fig. 1. Relationships between serum levels of LPO and prognostic indices (CRP and CT severity index). There were statistically significant correlation between LPO levels with CRP and CT severity index ($r=0.675, 0.373, p=0.001, 0.027$, respectively).

Table 4. Laboratory Parameters in Patients with Mild and Severe Pancreatitis according to Atlanta Classification

Parameters	Mild group (n=8)	Severe group (n=5)	p-value
Amylase (IU/dL)	374.7 ± 252.4	423.0 ± 253.1	0.745
Lipase (IU/dL)	10082.8 ± 12565.6	30008.0 ± 3314.9	0.167
CRP (mg/dL)	6.7 ± 4.5	12.3 ± 9.0	0.311
LPO (nmol/mL)	11.5 ± 6.8	38.7 ± 38.1	0.068
MPO (nmol/mL)	7.5 ± 4.1	20.1 ± 16.1	0.053
SOD (U/dL)	65.7 ± 49.2	27.3 ± 15.4	0.130
Ranson's score	1.4 ± 0.7	2.8 ± 1.9	0.177
CT severity index	2.0 ± 1.1	5.8 ± 3.1	0.008

($r=0.675$, 0.373 , $p=0.001$, 0.027)(Fig. 1). MPO CRP severity index CT ($r=0.334$, 0.382 , $p=0.049$, 0.024). 가 Ranson CT severity index ($r=0.202$, 0.319 , $p=0.143$, 0.044)(Fig. 2). SOD ($r=0.307$, 0.026 , $p=0.096$, 0.638) (Fig. 3).

Fig. 2. Relationships between serum levels of MPO and prognostic indices (CRP and CT severity index). There was no statistically significant correlation between MPO level and CRP ($r=0.202$, $p=0.143$). However, MPO level correlated positively and significantly with CT severity index ($r=0.319$, $p=0.044$).

Fig. 3. Relationships between serum enzymatic activity of SOD and prognostic indices (CRP and CT severity index). There were no statistically significant correlation between serum SOD concentrations with CRP and CT severity index($r=0.307$, 0.026 , $p=0.096$, 0.638 , respectively).

가

.139 30

.16

(interstitial edema)
(acinar cell)

가

가

interleukin-1, 6, 10
platelet activating factor (PAF), tumor necrosis
factor- (TNF-) 가

가

polyunsaturated fatty acid

(polymorphonuclear

leukocyte) (chemotaxis)
myeloperoxidase, elastase protease

arachidonic acid
prostaglandin, thromboxane

leukotriene 가 가

.910

가
(electron spin resonance technique, ESR)

glutathione

.9
1984

Sanfey 11

가

가

.9 가
stress, cerulein , choline-
taurocholate

deficient diet

가 가

C E

가 .9

가

가

가 .10,12,13

10

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