

알코올 금단과 혈중 아질산염 농도

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Alcohol Withdrawal and Serum Nitrite Concentration

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ABSTRACT

Objective : Nitric oxide(NO) has been known to be associated with tolerance and preference to alcohol. It has also been known to affect various alcohol drinking behavior, alcohol withdrawal symptoms and alcohol-induced brain damage. The purpose of this study was to determine the difference, among alcohol dependence group, alcohol drinking group and abstinence group, in serum concentration of nitrite, a stable metabolite of NO, and its relationship to clinical and biochemical markers of alcoholism.

Methods : Forty subjects diagnosed as alcohol dependence according to DSM - IV diagnostic criteria were evaluated for the clinical characteristics and biochemical markers of alcohol dependence including nitrite with their CIWA - Ar scores checked just after admission. Thirty - nine healthy controls were also evaluated, divided into twenty - three alcohol drinking group and sixteen abstinence group. Clinical characteristics were evaluated by CIWA - Ar, CAGE and AUDIT questionnaires. Aspartate aminotransferase(AST), alanine aminotransferase (ALT), gamma glutamyltransferase(GGT) and mean corpuscular volume(MCV) were used as the biochemical markers of alcohol dependence. Serum nitrite concentrations were measured by Griess reaction.

Results : 1) The concentrations of nitrite in alcohol dependence patients were not different from those in the control subjects. 2) There were no significant association between the nitrite concentrations and the CIWA - Ar scores in alcohol dependence patients. 3) Nitrites are significantly increased in alcohol dependence group and alcohol drinking group compared with abstinence group.

Conclusions : These findings suggest that serum nitrite concentration has no relation with alcohol withdrawal symptoms, but alcohol drinking increases serum nitrite concentration influenced by general condition of the body.

KEY WORDS : Alcohol dependence · Nitric oxide(NO) · Nitrite · Alcohol withdrawal · Alcohol drinking.

서론

([eNOS], 가 [iNOS], [nNOS])
(nitric oxide synthase, NOS)

(Nitric oxide, NO) 3가 isoform

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1) , NO acetylcholine bradykinin
 Endothelial - derived relaxing
 substance(EDRF) 2)
 NO
 3) NO
 NO
 (long - term po-
 tentiation, LTP) 4)
 aline, dopamine, glutamate
 NMDA 5)
 Baraona 6)
 NO가 63% 가 , Fitzgerald 7)
 가 nNOS
 NO 가 8)
 (nitrate) 가
 (nitrite)
 9)10) Persson
 Gustafsson 11)
 NO
 , Neiman 12)
 가 가
 가
 NO 가 13)
 NO NOS
 NOS
 NO (donor)
 14) , NOS
 가 (motor

incoordination) 15)
 NOS 가 NO
 16) . NO
 NO
 rate) (nitrite) 가 NO
 17) NO가
 13) 가
 가

연구대상 및 방법

1. 연구대상

1) 알코올 의존 환자군

2001 1 2002 5
 18~65
 DSM - IV 18)
 가
 CAGE 19) Alcohol Use Disor-
 ders Identification Test(AUDIT) 20)
 가 Clinical Institute Withdrawal
 Assessment for Alcohol(CIWA - Ar) 21)
 NO

2) 정상 대조군

18~65
 3
 6
 CAGE AUDIT CAGE
 AUDIT 10 4
 2

23 CAGE 2 AUDIT Student t - test
4 16 ,
Pearson
ANOVA
0.05
SPSS(version 11.0)

2. 생화학적 지표 및 혈중 아질산염의 측정

5cc 1,500rpm 7
2cc - 80 가

Aspartate aminotransferase(AST), Alanine aminotransferase(ALT), Gamma glutamyltransferase(GGT) Hitachi 736 , Complete blood count(CBC) Technicon H - 2
Griess 22)

결 과

1. 연구 대상의 인구학적인 특성
40 , 39
(p=0.660),
가 (p=0.711),
가 (p=0.324)(1).

2. 알코올 관련 지표
CAGE AUDIT
가 (p<0.000)(2).

3. 생화학적 지표 비교
AST, ALT, GGT, Mean corpuscular volume(MCV), 3
AST 139.85 ± 168.50(IU/l)
24.13 ± 6.38(IU/l)
(p=0.000), ALT 59.63
± 55.20(IU/l) 29.87 ± 14.98(IU/l)
(p=0.002). GGT
313.08 ± 417.85(IU/l)
23.79 ± 12.04(IU/l) (p=0.000).

Table 1. Demographic characteristics of alcohol de-pendence patients and normal controls

Variables	Alcohol dependence patients(n=40)		Normal controls(n=39)		p-value*
	Mean ± SD		Mean ± SD		
Age(years)	47.53 ± 10.7		46.6 ± 7.2		0.660
Education(years)	11.8 ± 2.6		12.0 ± 2.1		0.711
First drink(years-of-age)	19.3 ± 2.1		19.7 ± 1.8		0.324

* : Student t-test

Table 2. Clinical characteristics of alcohol dependence patients and normal controls

Variables	Alcohol dependence patients(n=40)		Normal controls(n=39)		p-value*
	Mean ± SD		Mean ± SD		
CAGE(scores)	3.98 ± 0.16		0.33 ± 0.48		0.000
AUDIT(scores)	33.55 ± 5.45		4.03 ± 3.13		0.000

* : Student's t-test

Table 3. Biochemical characteristics of alcohol dependence patients and normal controls

Variables	Alcohol dependence patients(n=40)	Normal controls(n=39)	p-value*
	Mean ± SD	Mean ± SD	
AST(IU/l)	139.85 ± 168.5	24.13 ± 6.38	0.000
ALT(IU/l)	59.63 ± 55.20	29.87 ± 14.98	0.002
GGT(IU/l)	313.08 ± 417.85	23.79 ± 12.04	0.000
MCV(um ³)	98.11 ± 8.54	93.13 ± 3.93	0.001
Nitrite(umol/l)	5.086 ± 3.64	5.677 ± 3.50	0.464

* : Student's t-test, AST : aspartate aminotransferase, ALT : alanine aminotransferase, GGT : gamma-glutamyltransferase, MCV : mean corpuscular volume

Table 4. Correlation between the variables and serum nitrite concentrations of subjects

Variables	Pearson's correlation coefficient	p-value
Age(years)	- 0.180	0.266
First drink(years-of age)	0.190	0.241
Last drink(days ago)	0.148	0.285
CAGE(scores)	0.255	0.054
AUDIT(scores)	- 0.136	0.403
CIWA(scores)	0.129	0.427
AST(IU/l)	0.142	0.382
ALT(IU/l)	0.254	0.113
GGT(IU/l)	0.057	0.725
MCV(um ³)	0.115	0.479

Last drink : the period between last drinking and blood sampling

MCV 98.11 ± 8.54(IU/l)
93.13 ± 3.93(IU/l)

(p=0.001). , 가 (p=0.464).

4. 혈청 아질산염과 다른 지표와의 상관관계

, , , CAGE, AUDIT, CIWA - Ar, AST, ALT, GGT (4).

5. 각 군에서 혈청 아질산염 농도

AUDIT (AUDIT 가 4~9), (AUDIT 가 3) (p=0.003)(

Table 5. Serum nitrite concentrations among alcohol dependence patients, alcohol-drinking and abstaining normal controls

Alcohol dependence patients(n=40)	Alcohol-drinking normal controls (n=23)	Abstaining Normal controls(n=16)
5.08 ± 3.64	7.22 ± 3.48	3.46 ± 2.10

* : ANOVA, F(test statistics) = 6.29, df (degree of freedom) = 78, p=0.003, Values are mean ± SD

Table 6. Bonferroni post hoc tests

(I)Exp.group	(J)Exp.group	Mean difference (I-J)	Std.Error	Sig.
Dependence	Drinking	- 2.133	.8740	.051
	Abstaining	1.626	.9879	.312
Drinking	Dependence	2.133	.8740	.051
	Abstaining	3.759*	1.0873	.003
Abstaining	Dependence	- 1.626	.9879	.312
	Drinking	- 3.759*	1.0873	.003

* : The mean difference is significant at the .05 level

5), Bonferroni

가 (6).

고 찰

NO 가 NOS

가 / NO NOS mRNA NOS

가 NO 가 ,

NO 가 가
 Sanchez - Rodriguez 가 가
 lympho - mononuclear cell 가 가
²³⁾ iNOS가 가 NO가 가
 가 , Hunt ²⁴⁾ NO 가 가
 가 가 가 mRNA
 가 가 25mM 가 650mM mRNA
 Yagnik 가
²⁵⁾ NO endotoxemia 가
 NO 가
 Syapin³²⁾ 가 NO
 NMDA cytokine NO
 가 NO
 가 cytokine NO
 NO
 가 iNOS , NO
 NO
 cytokine NO
³¹⁾ 가 iNOS eNOS 가 ³³⁾
 가 eNOS NO 가
³⁴⁾ eNOS 가가
 NO
 가 NO
 가 NO
 NO
 가 NO가
 가
 (li-
 popolysaccharide) iNOS 가
 NO 가 NO
 가 ²⁸⁾ 가
 4 NO
 TNF - 가 가 12
 가
 TNF - 가 aspartate aminotransferase
²⁹⁾ TNF - IFN - (AST), alanine aminotransferase (ALT), gamma -

glutamyltransferase(GGT), mean corpuscular volume (MCV) CAGE, AUDIT, CIWA - Ar,

1)
2)
3)

가

가

가

NO 가
가

중심 단어 :

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