

외상후 스트레스 장애 환자의 신경인지기능

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Neurocognitive Functions in Posttraumatic Stress Disorder

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ABSTRACT

Objective : The differences of various neurocognitive functions, including attention, memory, motor function, and higher cognitive function were compared between PTSD patients and normal control subjects. Also, correlation with PTSD symptom severity and neurocognitive functions were evaluated between PTSD patients and normal control subjects.

Method : We assessed the neurocognitive functions by computerized neurocognitive test(CNT) batteries. The visual continuous performance test(CPT) and digit span test, finger tapping test and Wisconsin card sorting test(WCST) were executed. The Impact of Event Scale - Revised(IES - R) was used in the evaluation of the severity of PTSD.

Result : The PTSD patients showed significantly impaired neurocognitive performance in all of the items, compared with normal control subjects. The relation between impairment in neurocognitive functions and symptom severity showed significant correlations.

Conclusion : These results imply that PTSD patients have impaired neurocognitive functions concerning with specific brain areas, especially the frontal area. For the thorough evaluation of further neurocognitive functions, more detailed evaluation items of neurocognitive functions and brain imaging studies are necessary in the future study.

KEY WORDS : PTSD · Neurocognitive functions.

 서 론

order ; PTSD)

1

(Posttraumatic stress dis-

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(concentration), (memory),¹³⁾ , PTSD
 (attention)
 1-5) PTSD 가 , Vasterling¹²⁾
 PTSD 가 , PTSD
 가 Stein¹⁴⁾ PTSD
 (executive function)
 (frontal - subcortical
 dysfunction)
 가 (frontal gray matter)
 . Sachinvala¹⁵⁾
 (Postconcussional syndrome) PTSD
 , Jenkins¹⁶⁾
 PTSD
 6-8) (continuous performance test) ,
 가 (omission error) ,
 가 (backward digit span)
 가 PTSD
 , Wolfe
 , 가 Schlesinger¹³⁾ PTSD
 PTSD (immediate me-
 mory) , Alfrano¹⁷⁾
 PTSD (digit span)
 6 9)10) PTSD
 PTSD (frontal lobe), PTSD가
 (amygdala), (hippocampus), (locus coe-
 ruleus) 18) PTSD . Golier
 .¹¹⁾ PTSD (visual continuous performance test)
 , (sustained attention), (wor-
 king memory) (prefrontal 가 , PTSD
 cortex) 가
 .¹²⁾
 , (antero-
 grade memory impairment) .⁸⁾
 , PTSD 가
 13) , 가 ,

(Computerized neurocognitive functions test system)가 , 3) 가 , 4) , 5) 가 , 6) 7)8) 가 PTSD , 7) , PTSD 가 PTSD 가 PTSD 37 7 PTSD 가 PTSD 가 PTSD 30 , 30 PTSD

대상 및 방법

2) 대조군 선정

20 50

1. 연구 대상

1) 환자군 설정

2002 10 2003 5 PT- 가

SD

PTSD . 1) DSM - (diagnostic and Statistical Manual of mental Disorders. 4th edition) 2

2. 연구 도구

PTSD , 2) 가 20~50

, 3) , 4) 1

.(

1

.¹²⁾ 5)

가

, 6)

1)

(, ,

가 가

1) 숫자 따라하기 검사(Digit span test)

2)

가 , 가
가 (forward digit span)
(backward digit span)가

4) 위스콘신 카드분류 검사(Wisconsin card sorting test ; 이하 WCST)

. 3
가
가 ,
,
19-21)

4
, ,
가
10
,
10

2) 시각 연속수행력 검사(Visual continuous performance test)

가 3
(correct response), (omission error), (commission error)
가 ,
가
(vigilance)
(selective attention)
22)

10
가 22-30)
가
10
10 (categories achieved),
(perseverative error),
(nonperseverative error)
,
,

3) 손가락 두드리기 검사(Finger tapping test)

가 , 가
가 가 가
가
가 가
10
, , ,
,
22)
,
가
가 가

5) 사건충격 척도(The Impact of Event Scale ; 이하 IES)

IES Horowitz가
32) 가
가
33-36) IES
7 ,
32)33)
6 , 8 1 가 가

7 가 22 , 12.57 ± 1.87 (t=)
 가 IES - R(The Impact of Event Scale - Re- 1.320, df=58, p=0.192). PTSD
 vised) 14)36) 22 가 102.40 ± 7.99, 105.10 ± 3.81
 0 4
 1 37) 88 , 0 (t= 1.672, df=58, p=0.100).
 38)

3. 통계 분석

SPSSWIN 11.0 , 2
 PTSD , 2
 , 가 , . t 가
 , 가 , .
 t - test(t) ,
 test() Chi - Square . t 가
 t
 , IES - R PTSD
 Pearson
 () 0.05 .

2. 숫자 따라하기 검사

(short - term memory)
 , 가 ,
 2
 가

3. 시각 연속수행력 검사

가 ,
 2
 가

4. 손가락 두드리기 검사

가 ,
 2
 PTSD
 . t

결 과

1. 인구 통계학적 특성

1
 PTSD 35.60 ± 7.22 ,
 33.37 ± 5.65 PTSD
 (t= - 1.334,
 df=58, p=0.188). PTSD 11.87 ± 2.

5. 위스콘신 카드분류 검사

(higher cognitive function)
 가 ,
 2 . t

Table 1. Demographic data in PTSD patients and normal control subjects

	PTSD (N=30)	Normal controls (N=30)	df	t/ ²	P
Age(years)	35.60 ± 7.22	33.36 ± 5.64	58	- 1.334	0.187 N.S.
Education(year)	11.87 ± 2.22	12.57 ± 1.87	58	1.320	0.192 N.S.
IQ	102.40 ± 7.99	105.10 ± 3.81	58	1.672	0.100 N.S.
Sex					
Male	13	14	1	0.067	0.795 N.S.
Female	17	16			

PTSD : Posttraumatic stress disorder, N.S. : statistically not significant (p>0.05)

Table 2. A comparisons of PTSD patients and normal controls on DS, VCPT, WCST and FT

Measure	PTSD		Normal controls		t	P
	(N=30)		(N=30)			
DS FOR	5.80 ± 1.58		7.87 ± 0.43		6.890	0.000
DS BACK	3.87 ± 1.22		6.23 ± 1.01		8.180	0.000
VCPT CR	118.17 ± 30.03		133.53 ± 2.37		2.794	0.007
VCPT OE	23.77 ± 43.61		3.35 ± 2.70		-2.755	0.007
VCPT CE	25.44 ± 41.57		3.03 ± 2.96		-2.799	0.007
WCST CA	4.80 ± 1.52		6.00 ± 0.00		4.331	0.000
WCST PE	124.90 ± 195.98		9.43 ± 3.72		-3.227	0.002
WCST NPE	118.67 ± 200.31		5.47 ± 4.25		-3.095	0.003
FT R	45.32 ± 7.92		54.45 ± 4.53		5.481	0.000
FT L	41.45 ± 7.86		50.72 ± 3.77		5.824	0.000

PTSD : Posttraumatic stress disorder
 DS FOR : Digit span forward, DS BACK : Digit span backward
 VCPT CR : Visual continuous performance test, correct response
 VCPT OE : Visual continuous performance test, omission error
 VCPT CE : Visual continuous performance test, commission error
 WCST CA : Wisconsin card sorting test, categories achieved
 WCST PE : Wisconsin card sorting test, perseverative error
 WCST NPE : Wisconsin card sorting test, nonperseverative error
 FT R : Finger Tapping Right, FT L : Finger Tapping Left

Table 3. Correlations among variables of neurocognitive functions and PTSD symptom severity in PTSD patients

	DS FOR	DS BACK	VCPT CR	VCPT OE	VCPT CE	WCST CA	WCST PE	WCST NPE	FT R	FT L
IES - R#										
PC	-.511**	-.612**	-.646**	.707**	.709**	-.623**	.560**	.560**	-.641**	-.550**
P	.004	.000	.000	.000	.000	.000	.001	.001	.000	.002

** : p < .01, # : IES-R : The Impact of Event Scale-Revised, PC : Pearson correlation, P : p-value

6. IES-R과 신경인지기능과의 관계 (fronto - striatal neural system)
 (The Impact of Event Scale - Revised)
 PTSD IES - R 가 PTSD 가
 고 찰 가 4 가 4)
 PTSD 가 5 가 4)가 가
 PTSD 가 8)14)39) 가 (2).

가 3 (dorsal medial nucleus of thalamus)
 가 3 (reverberation neural circuit)
 (inferior frontal convexity)
 , Bremner 58) PET
 (anterior prefrontal cortex), (posterior cingulate gyrus), (motor cortex)
 PTSD
 PTSD
 (limbic system),
 (temporal lobe) 가
 가
 , Bremner 49-51) 가
 PTSD
 가
 가 PTSD
 . Diamond 53) 가
 가
 PTSD
 (basal ganglia)
 가
 가 (cortical frontotemporal zones) (diencephalic reticular systems)
 Wolfe 55) PTSD 가
 가
 가 60)61) 37) (parietal lobe)

Posner³⁹⁾ PET
(ascending, descending pathway)
가가
가가⁶¹⁾
PTSD
가¹²⁵
⁶²⁾
(2). PTSD
가 PTSD 가
⁶³⁾
³⁷⁾ (superior parietal lobe),
(anterior cingulate gyrus),
(right frontal lobe)⁶⁴⁾
가²²⁾⁴³⁾ 가
가가
⁶³⁾
가
(posterior frontal lobes)
가
PTSD
22)43) 가
PTSD 가
³⁷⁾ 가⁴⁴⁻⁴⁶⁾ PTSD 가
가 PT-SD
가
가
가
, Vasterling,
Brailey⁵⁹⁾ PTSD
가
PTSD

중심 단어 :

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PTSD

PTSD

가

가

PTSD

PTSD

PTSD

PTSD

결과

연구 목적 :

가

방법 :

(N=30), (N=30)

가

가

가

결과 :

가

결과 :

가

PTSD

가

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