

교통사고관련 환자에서 사건상상에 대한 정신생리반응 Psychophysiological Responses to Event Imagery in Traffic Accident Related Patients

정상근^{1,2,3} · 최명수¹ · 황익근^{1,2,3}

Sang-Keun Chung,^{1,2,3} Myong-Su Choi,¹ Ik-Keun Hwang^{1,2,3}

ABSTRACT

Objectives: The experience of traffic accident is a kind of the psychosocial stressors to person. The traffic accident - related patients may show the psychophysiological hyperarousal. So we examined the differences of psychophysiological response between patients with and without the memory of experiencing a traffic accident.

Methods: Twenty - four traffic accident - related patients were divided into two groups according to their memory of a traffic accident. In psychological assessment, levels of anxiety and depression were evaluated by State - Trait Anxiety Inventory, Beck's Depression Inventory, and Hamilton Rating Scales For Anxiety and Depression. Heart rate, electrodermal response (EDR), and electromyographic activity (EMG) were measured by biofeedback system, and systolic and diastolic blood pressure by automated vital sign monitor during baseline, task, and rest periods. We utilized script - driven imagery technique as a stressful task. The patients listened to the script describing their own traffic accident experience and were instructed to imagine the event during the task period. Statistically analytic data were obtained from the differences of psychological and psychophysiological data between two groups.

Results: The memory group did not show significantly higher EDR than the none memory group, but showed higher tendency during baseline, imagery, and rest periods. The memory group showed significantly lower EMG than the none memory group during rest period. However, there were no differences in other psychophysiological responses between the two groups.

Conclusion: Our results showed that the memory group had higher tendency in autonomic arousal level such as electrodermal response than the none memory group. We suggest that physicians need to minimize repetitive imagery of traffic accident (re - experience), and decrease the autonomic hyperarousal in the treatment of traffic accident - related patients. *Sleep Medicine and Psychophysiology* 2001 ; 8(1) : 45-51

Key words: Traffic accident · Event imagery · Psychophysiological response.

서 론

가

(1 - 6).

가

가

가

1997

¹Department of Psychiatry, ²Institute for Medical Sciences, and ³Research Institute of Clinical Medicine, Chonbuk National University Medical School, Chonju, Korea

Corresponding author: Sang-Keun Chung, Department of Psychiatry, Chonbuk National University Medical School, Keumam-dong San 2-20, Chonju 561-712, Korea

Tel: 063) 250-1398, Fax: 063) 275-3157

E-mail: cjsk@moak.chonbuk.ac.kr

(7)가

가

10

(8 - 17)

3. 자료처리

Biofeedback system

SPSS window version 7.1.2

Mann - Whitney U - test

Kruskal Wallis test

Crosstabs

Spearman rho
(startle response)

(recovery response)

p<0.05

결 과

1. 연구대상자들의 인구통계학적 및 임상적 특성

12 8 4
41.42 ± 9.10 , 10.33 ± 3.14
12 8 4
44.08 ± 9.83 , 10.92 ± 3.40

5

, 7

8

, 4

($\chi^2=15.11, df=3.17, p=0.001$).

8.00 ± 4.49

16.17 ±

14.69

(p=0.017)(1).

2. 사고에 대한 기억유무와 뇌 영상소견

12

(Brain

MRI)

7

5

(p=0.001).

(Brain SPECT)

4

8

3

9

(2).

3. 사고에 대한 기억 유무와 정신상태 평가

3

Table 1. Demographic data and clinical characteristics in traffic accident related patient

	Accident memory		p-value
	Yes (N=12) M (SD)	No (N=12) M (SD)	
Age (year)	41.42 (9.10)	44.08 (9.83)	ns ^a
Education (year)	10.33 (3.14)	10.92 (3.40)	ns ^a
Sex : Male (N)	8	8	
Female (N)			
Psychiatric diagnosis by ICD-10	4	4	.001 ^b
1) Personality and behavioral disorder due to brain damage and dysfunction (N)	0	8	
2) Postconcussional disorder (N)	5	4	
3) Post-traumatic disorder (N)	7	0	
Duration after traffic accident (month)	8.00 (4.99)	16.17 (14.69)	.017 ^a

N : number, a : Statistical significances were tested by Mann-Whitney U-test, b : Statistical significance was tested by Kruskal-Wallis test, ns : non-significant

Table 2. Findings of brain MRI and SPECT in traffic accident related patients

	Accident memory		p-value
	Yes (N=12)	No (N=12)	
Brain MRI			.001
Normal	12	7	
Abnormal	0	5	
Brain SPECT			ns
Normal	4	3	
Abnormal	8	9	

Statistical significances were tested by crosstabs
ns : non-significant

Table 3. Psychological measures in traffic accident related patients

	Accident memory		p-value
	Yes (N=12) M (SD)	No (N=12) M (SD)	
BDI	44.17 (12.57)	41.92 (10.71)	ns
HRSD	22.83 (6.53)	25.50 (7.47)	ns
Anxiety, state	68.75 (9.08)	67.25 (8.05)	ns
Anxiety, trait	48.92 (13.71)	56.33 (12.00)	ns
HAS	22.58 (9.61)	24.50 (8.23)	ns
SUDS (0 - 100)	53.33 (33.12)	60.00 (31.33)	ns
VIVID (0 - 100)	57.50 (33.61)	51.67 (37.38)	ns

Statistical significances were tested by Mann-Whitney U-test
BDI : Beck depression inventory, HRSD : Hamilton rating scale for depression, HAS : Hamilton anxiety scale, SUDS : a rating of subjective units of discomfort, VIVID : a vividness of imagery rating, ns : non-significant

4. 정신생리적 반응양상

(p=0.028)(5).
 가 (p=0.025),
 (p=0.023),
 (p=0.004), (p=0.008)
 (6).
고 찰
 가 , Mayou (25)
 가 가
 가 4.00 ± 1.64
 가 2.65 ± 1.34

Table 4. Blood pressure, heart rate in traffic accident related patients (N=24)

	Accident memory		p-value
	Yes (N=12) M (SD)	No (N=12) M (SD)	
Blood pressure, diastolic (mmHg)			
Baseline	68.76 (10.65)	70.56 (8.96)	ns
Imagination	72.07 (10.29)	73.89 (10.40)	ns
Rest	69.18 (9.28)	70.92 (10.46)	ns
Startle response	3.31 (4.18)	3.33 (3.42)	ns
Recovery response	2.89 (4.40)	2.97 (5.80)	ns
Blood pressure, systolic (mmHg)			
Baseline	112.37 (17.51)	118.92 (15.86)	ns
Imagination	119.40 (18.59)	125.06 (14.85)	ns
Rest	114.32 (16.10)	118.72 (15.39)	ns
Startle response	7.03 (5.07)	6.14 (3.99)	ns
Recovery response	5.08 (4.83)	6.33 (3.26)	ns
Heart rate (times/minute)			
Baseline	79.04 (15.12)	71.72 (10.86)	ns
Imagination	81.48 (12.12)	75.72 (13.17)	ns
Rest	77.41 (12.71)	72.46 (10.23)	ns
Startle response	2.44 (4.95)	4.00 (4.84)	ns
Recovery response	4.07 (4.33)	3.26 (5.57)	ns

Statistical significances were tested by Mann-Whitney U-test
 Startle response=change (task - baseline), Recovery response=change (task - rest), ns : non-significant

Table 5. Electrodermal response, electromyography in traffic accident related patients (N=24)

	Accident memory		p-value
	Yes (N=12) M (SD)	No (N=12) M (SD)	
Electrodermal response (μ Mhos)			
Baseline	16.79 (13.60)	7.37 (3.32)	ns
Imagination	16.67 (12.44)	8.52 (4.16)	ns
Rest	17.26 (12.57)	8.59 (4.16)	ns
Startle response	-0.14 (3.69)	1.15 (1.72)	ns
Recovery response	-0.60 (2.58)	-0.07 (1.72)	ns
EMG (μ V)			
Baseline	3.04 (1.71)	3.94 (2.28)	ns
Imagination	2.94 (1.75)	3.99 (2.28)	ns
Rest	2.65 (1.34)	4.00 (1.64)	.028
Startle response	-0.10 (1.19)	0.05 (2.97)	ns
Recovery response	0.28 (1.64)	-0.02 (2.58)	ns

Statistical significances were tested by Mann-Whitney U-test
 Startle response=change (task - baseline), Recovery response=change (task - rest), ns : non-significant

Table 6. Spearman's rho correlation coefficients in traffic accident related patients

	SUDS	VIVID	EDR. base	EDR. imagery	EDR. rest
Duration after traffic accidents	-.339	-.457	-.463	-.570	-.528
(p-value)	(ns)	(.025)	(.023)	(.004)	(.008)

Statistical significances were tested by Spearman's rho correlation coefficient
 ns : non-significant

(Corrugator)

가 가

가 Pitman (13) 가

alev (15) 가 가 가 Sh- 가

요 약

목 적 :

가 가가

대상 및 방법 :

Pitman 가

24

(12 , 41.42 ± 9.10 ;
10.33 ± 3.14)
(12 , 44.08 ± 9.83 ; 10.92 ± 3.40)
가

, Beck , Hamilton

가 가

가

J & J I - 330

DINAMAP XL Monitor mode 9340

가 가 가

15 (3) -
(30) - (3) - (3)'

가

가

결 과 :

, Pitman (12)

가

가

(p=0.028).

결 론 :

()

중심 단어 :

REFERENCES

1. 정인형, 강민희. 두부외상후 정신장애 감정환자에 관한 임상적 연구. *신경정신의학* 1995;34:1693-1705
2. Mayou R, Bryant B, Duthie R. Psychiatric consequences of road traffic accidents. *BMJ* 1993;307:647-651
3. Mayou R, BM, FRCP, FRCPsych, Tyndel S, BA, Bryant B, MSc. Long term outcome of motor vehicle accident injury. *Psychosom Med* 1997;59:578-584
4. Brom D, Kleber RJ, Hofman MC. Victims of traffic accidents: Incidence and prevention of post-traumatic stress disorder. *J Clin Psychol* 1993;49:131-140
5. Blanchard EB, Hickling EJ, Barton KA, Taylor AE, Loos WR, Alexander JJ. One year prospective follow-up of motor vehicle accident victims. *Behav Res Ther* 1996;34:775-786
6. Gallo AD, Barton J, LI W, Jones P. Road traffic accidents: early psychological consequences in children and adolescents. *Br J Psychiatry* 1997;170:358-362
7. Blanchard EB, Hickling EJ, Taylor AE. The psychophysiology of motor vehicle accident related posttraumatic stress disorder. *Biofeedback and Self-Regulation* 1991;16:449-458
8. Dobbs D, Wilson WP. Observations on the persistence of war neurosis. *Dis Nerv Syst* 1960;21:40-46
9. Blanchard EB, Kolb LC, Pallmeyer TP, Gerardi RJ. A psychophysiological study of post traumatic stress disorder in Vietnam veterans. *Psychiatr Q* 1982;54:220-229
10. Malloy PF, Fairbank JA, Keane TM. Validation of a multimethod assessment of posttraumatic stress disorders in Vietnam veterans. *J Consult Clin Psychol* 1983;51:499-494
11. Blanchard EB, Kolb L, Gerardi RJ, Ryan P, Pallmeyer TP. Cardiac response to relevant stimuli as an adjunctive tool for diagnosing posttraumatic stress disorder in Vietnam veterans. *Behav Ther* 1986;17:592-606
12. Pitman RK, Orr SP, Foa DF, ACSW, de Jong JB, Claiborn JM. Psychophysiological assessment of posttraumatic stress disorder imagery in Vietnam combat veterans. *Arch Gen Psychiatry* 1987;44:970-975
13. Pitman RK, Orr SP, Foa DF, Altman B, de Jong JB, Herz LR. Psychophysiological response to combat imagery of Vietnam veterans with posttraumatic stress disorder versus other anxiety disorders. *J Abnorm Psychol* 1990;99:49-54
14. Orr SP, Pitman RK. Psychophysiological assessment of attempts to simulate post-traumatic stress disorder. *Biol Psychiatry* 1993;33:127-129
15. Shalev AY, Orr SP, Pitman RK. Psychophysiological response during script-driven imagery as an outcome measure in posttraumatic stress disorder. *J Clin Psychiatry* 1992;53:324-326
16. Shalev AY, Orr SP, Pitman RK. Psychophysiological assessment of traumatic imagery in Israeli civilian patients with posttraumatic stress disorder. *Am J Psychiatry* 1993;150:620-624
17. Shalev AY, Peri T, Gelpin E, Orr SP, Pitman RK. Psychophysiological assessment of mental imagery of stressful events in Israeli civilian posttraumatic stress disorder patients. *Comprehensive Psychiatry* 1997;38:269-273
18. Hamilton M. The assessment of anxiety states by rating. *Br J Med Psychol* 1959;32:50-55
19. 김정택. 특성불안과 사회성의 관계. 석사학위논문, 고려대학교;1978
20. 한홍무, 염태호, 신영우, 김교현, 윤도준, 정근재. Beck Depression Inventory의 한국판 표준화 연구. *신경정신의학* 1986;25:487-502
21. Hamilton M. Development of a rating scale for primary depressive illness. *Br J Soc Clin Psychol* 1967;6:278-296
22. 정상근, 황익근, 은홍배, 정일성. 불안장애의 신체증상에서 자가보고와 생리적 측정치. *최신의학* 1996;39(6):31-37
23. 정상근, 황익근, 은홍배, 박기만. 정상인의 스트레스작업에 따른 정신생리적 반응양상. *신경정신의학* 1996;35(5):997-1006
24. 정상근, 황익근. 범불안장애환자의 정신생리적 반응. *수면정신생리* 1997;4(1):107-119
25. Mayou RA, Black J, Bryant B. Unconsciousness, amnesia and psychiatric symptoms following road traffic accident injury. *Br J Psychiatry* 2000;177:540-545
26. Lang PJ. A bio-informational theory of emotional imagery. *Psychophysiology* 1979;16:495-512
27. Levin DN, Cook EW, Lang PJ. Fear imagery and fear behavior: Psychophysiological analysis of clients receiving treatment for anxiety disorders. *Psychophysiology* 1982;19:571-572
28. Lang PJ, Levin DN, Miller GA, Kozak MJ. Fear behavior, fear imagery, and the psychophysiology of emotion: The problem of affective response integration. *J Abnorm Psychol* 1983;92:276-306
29. McNeil DW, Melamed BG, Cuthber BN, Lang PJ. Emotional imagery and psychophysiological responsivity in simple phobia and agoraphobia. *Psychophysiology* 1983;20:459
30. Sbordone RJ, Liter JC. Mild traumatic brain injury does not produce post-traumatic stress disorder. *Brain Inj* 1995;9:405-412
31. McMillan TM. Post-traumatic stress disorder and severe head injury. *Br J Psychiatry* 1991;159:431-433
32. Squire CR. Declarative and non-declarative memory: multiple brain systems supporting learning and memory. *Journal of Cognitive Neuroscience* 1992;4:232-243
33. Layton BS, Wardi-Zonna K. Post-traumatic stress disorder with neurogenic amnesia for the traumatic event. *The Clinical Neuropsychologist* 1995;9:2-10