

## 정신분열병 환자에서 부정적 감정이 청각적 언어상상에 의해 유발된 대뇌 피질 활성화에 미치는 영향\*

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### The Influence of Negative Emotion to Cortical Activity Induced by Auditory Verbal Imagery in Patients with Schizophrenia\*

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#### ABSTRACT

**Objectives** : Cognitive psychological models propose that auditory hallucinations arise from a problem with monitoring one's auditory verbal imagery. Most auditory hallucinations are derogatory in content and accompany negative emotions. If auditory verbal imagery plays an critical role in the pathogenesis of auditory hallucination, it must be influenced by negative emotions.

This study was aimed at understanding the influence of negative emotions on the development of hallucinations by investigating the way by which negative emotions have influence on cortical activity induced by auditory verbal imagery.

**Methods** : For both normal subjects and patients with schizophrenia, quantitative electroencephalography(Q - EEG) was applied during the auditory verbal imagery tasks using a two word list. The one word list accompanied negative emotion and the other accompanied neutral emotions. The difference of EEG activity between two tasks was compared by paired t - test. We also compare the difference of the influence of negative emotions between normal subjects and patients with schizophrenia

**Results** : In normal subjects, amplitude of beta wave was increased in temporal area such as TCP1, and, the amplitude of theta frequency wave was decreased in right hemisphere such as FP2, F4, C4, CP2, P4. But, in the schizophrenia group, there were no significant differences.

**Conclusion** : These results may suggest that auditory verbal imagery with negative emotion requires more activation in left temporal area, but, appropriate activation may not achieved in schizophrenia patients. So, the possibility that the resultant disturbance of verbal self monitoring may be related to auditory hallucination is suggested in this study.

**KEY WORDS** : Negative emotion · Auditory verbal imagery · Verbal self monitoring · Auditory hallucination · Schizophrenia.

서 론

(subvocal muscle)

(Robert  
1952 ; Lindsely 1963 ; Inouye Shimizu 1970),  
(inner speech)  
(subvocalization)

1999 ( )

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(Bick Kinsbourne 1987)

McGuire (1993) 가  
Broca 가 가

1) 포함기준

DSM- (American Psychiatric As-

memory) Broca 가 가 (verbal working  
1993) (Paulesu

sociation 1994)

가

(auditory verbal imagery)

; 1) 가 18 45 , 2) Edin-

Done 1987 ; David 1994).

(Firth burgh Handedness Inventory(Oldfield 1971)

Broca

12 , 3) , 4)  
1 , 6) , 7)

가 (Smith 1992),

2) 제외기준

1)

가가

, 2)

(Firth Done 1987).

, 3) , 4)

McGuire (1996a) (positron emi -  
ssion tomography, PET) , 6)

2. 연구방법

(McGuire 1996b).

1) 청각적 언어상상(Auditory verbal imagery) 과제 수행

(verbal self monitoring)

가가

50cm Personal computer mo -  
nitor 5 1 20

( , )

가

가

가

(用言)

4

연구대상 및 방법

1. 연구대상

가  
가

## 결 과

### 1. 연구대상의 인구학적 자료

18 ( 11, 7), 가 25  
 ( 17, 8) . 25.7 ± 2.1  
 , 29.3 ± 6.6 .  
 12 ( 1).

### 2. 독립적 내용의 청각적 언어 상상 과제 시와 부정적 내용의 청각적 언어상상과제시의 뇌파 진폭 비교

#### 1) 정상 대조군

Alpha  
 , TT1(t=1.36, p=0.19) 가  
 , F4 (t=2.02, p=0.06). Beta  
 TCP1 가 (t=2.18, p=0.04), T5 가  
 (t=2.01, p=0.06).  
 . Theta FP2  
 (t= -2.38, p=0.03), F4(t= -3.18, p=0.01), C4(t= -2.30, p=0.04), CP2(t= -2.27, p=0.04), P4(t= -2.18, p=0.04)  
 . Delta

#### 2) 정신분열병 환자군

4가

## 고 찰

**Table 1.** Demographic data of subjects

	Schizophrenia group	Normal control group
Number of subjects	25	18
Gender		
Male	17	11
Female	8	7
Mean age	29.3 ± 6.6 years	25.7 ± 2.1 years
Total duration of education	>12 years	>12 years

### 2) 자료 수집

### 3) 정량화 뇌파측정

10  
 , 2 32 가  
 (ElectroCap , 1994 , Eaton, Ohio, USA) international 10 20  
 system impedance 10k .  
 , 4가  
 Neuronics( , 1995 , )  
 (Lee 1989). 1 epoch epoch  
 sampling 256 . arti -  
 fact artifact가 20  
 30  
 epoch fast Fourier transformation(FFT)  
 . delta 1 4Hz, theta 4 8Hz,  
 alpha 8 13Hz, beta 13 22Hz . 30  
 brain map ( 1996). 4가 4가  
 map , map 30 ( μ  
 V)

### 4) 분석 방법

paired t - test  
 SPSS/PC + (WIN)  
 0.05



theta

theta

theta

FP2, F4, C4, CP2, P4

theta

(Schwartz 1975 ; Dimond 1976 ; Suberi  
McKeever 1977 ; Kyle 1985)

theta 가

(lateralization) 가

가

가

가

가

### 요 약

연구목적 :

방 법 :

가

paired t - test

가

가

결 과 :

(TCP1) beta

가 , (FP2, F4, C4,  
CP2, P4) theta

가

가

결 론 :

가

가

중심 단어 :

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