

다채널 청각 사건관련전위 P300 결정에서 전부위장력측정법과 전통적방법의 비교*

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Comparison of Global Field Power Measurement and Conventional Method in Multi-channel Auditory Event Related Potential P300 Determination*

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ABSTRACT

Objective : The present study was designed to compare Global Field Power Measurement and conventional method in P300 determination.

Method : The subjects were composed of patients(N = 20) with schizophrenia by DSM - IV and normal controls(N = 20). The auditory event related potential P300 was measured by " oddball paradigm ". P300 components were determined by Global Field Power Measurement and conventional method at 5 electrodes(Fz, Cz, Pz, T₃, T₄).

Results : P300 amplitudes of patients were smaller than those of controls across all electrodes and in both methods, but there was no differential power in P300 determination between two methods. Asymmetry of auditory event - related potential P300 was not shown between patients with schizophrenia and normal controls.

Conclusion : It is implicated that it depends on clinical situations and research purposes what method of P300 determination will be more appropriate for patients with schizophrenia.

KEY WORDS : Schizophrenia · P300 · Global field power measurement · Conventional method · Asymmetry.

1/1000 (msec)

서 론

P300

Sutton (1965)

가

2000 가

가

(Donchin 1981),

가

(McCarley 1993).

P300

10 -

가 P300 가 Cz

Pz 1~2 (Polich

1992, 1996, 1998, 1999)

P300

(Duffy 1981, 1982).

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P300 가
(Maurer Dierks 1991 ; Hamburger van der Burgt 1991).

2. P300의 결정 및 지형학적인 분석

(Ag - AgCl)

10 - 20

2.5Kohm

가
가

가

21

가

가

가 가

1000Hz

2000Hz

2000Hz

가

(Global Field Power Measurement : GFPM)
(Lehmann Skrandies 1980).

(correct counted

percent : $100 \times \text{number of correct count stimuli} / \text{number of given stimuli}$, CCP)가 90%

1.1 , 70dB,

1 : 4

40msec,

10msec,

512msec

0.3Hz,

100Hz

30Hz

P300

(Brain Atlas III ; Biologic Co. U.S.A.)

P300

GFPM

가 Fz, Cz, Pz, T₃, T₄ 5

250 450

GFPM

P300

msec

가

P300

(para-

방 법

meters)

. GFPM

(time window) 가

(Global Field

Power ; GFP)

1. 연구대상

() 가

Fz, Cz, Pz, T₃, T₄ 5

DSM - IV(American Psy -

P300

chiatric Association 1994)
20 (9 , 11) 29.9±5.6 (29.8±5.6 , 29.9±5.9) . ()

3. 통계처리

(antero - posterior)

Fz, Cz, Pz

가

P300

(Group × Method × Midline Electrode).

20 (9 , 11)

(left - right)

T₃, Cz, T₄ P300

28.6±6.6 (29.0±6.1 ,

Method × Transverse Electrode)

(Group ×

28.3±7.3) . , ,

(Group × Latency)

GFPM

5

6

Scheffe
05 (mean, M) (standard deviation, SD)

결 과

1. 전후방향에서의 P300 전위값 분석(1)

P300 Fz, Cz, Pz
6.5 ± 2.4 μV, 8.8 ± 3.8 μV, 8.9 ± 2.8 μV,
3.5 ± 1.9 μV, 5.7 ± 2.2 μV, 6.0 ± 2.3 μV . GFPM
P300 Fz, Cz, Pz 5.7 ± 2.7 μV,
8.8 ± 3.2 μV, 8.5 ± 3.0 μV, 2.5 ± 1.9 μV, 5.0 ± 2.1
μV, 5.5 ± 2.2 μV .
P300 (Group effect : F(1, 38) = 18.0, p<0.0001).
GFPM (Method effect : F(1, 38) = 17.4, p<0.001), Fz P300 Cz Pz
(Electrode effect : F(2, 76) = 68.6, p<0.0001).
(Group × Method) (F(1, 38) = 1.5, p=0.23),
(Group × Midline Electrode) (F(2, 76) = 0.48, p=0.62).
(Method × Midline Electrode) (F(2, 76) = 4.7, p<0.02), Cz Pz 가 (Cz, p=0.26 ; Pz, p=0.14) Fz
GFPM (p<0.0001).
(Group × Method × Midline Electrode) (F(2, 76) = 1.5, p=0.24).

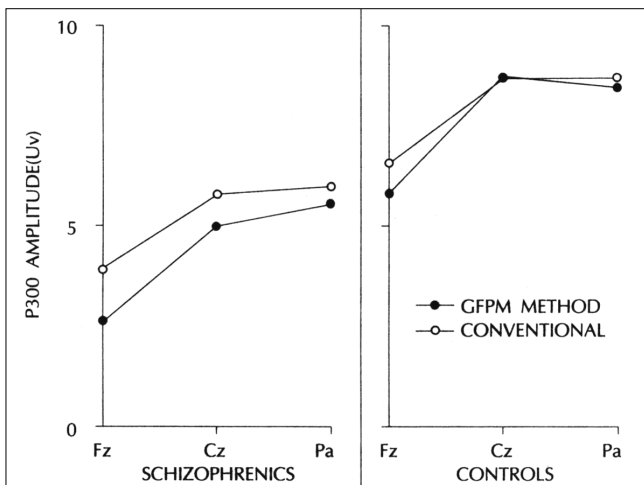


Fig. 1. P300 Amplitudes of midline electrodes by Global Field Power Measurement and Conventional Method in schizophrenics and normal controls.

2. 좌우방향에서의 P300 전위값 분석(2)

P300 T₃, Cz, T₄
4.6 ± 1.6 μV, 8.8 ± 3.8 μV, 4.8 ± 2.1 μV,
3.1 ± 1.4 μV, 5.7 ± 2.2 μV, 3.0 ± 1.3 μV . GFPM
P300 T₃, Cz, T₄, 4.1 ± 1.8 μV,
8.8 ± 3.2 μV, 4.1 ± 2.3 μV, 2.5 ± 1.5 μV, 5.0 ±
2.1 μV, 2.5 ± 1.4 μV .
P300 (Group effect : F(1, 38) = 15.7, p<0.001).
GFPM (Method effect : F(1, 38) = 21.0, p<0.0001).
(Cz) P300 (T₃) (T₄)
(Electrode effect : F(2, 76) = 82.7, p<0.0001).
(Group × Method) (F(1, 38) = 0.64, p=0.44),
(Method × Lateral Electrode) (F(2, 76) = 0.8, p=0.45).
(Group × Lateral Electrode) (F(2, 76) = 5.66, p<0.01), 가
Cz T₃ T₄ .
(Group × Method × Lateral Electrode) (F(2, 76) = 2.8, p=0.07).

3. P300 잠복기 분석

P300 Fz, Cz, Pz, T₃, T₄
318 ± 30msec, 324 ± 27msec, 323 ± 25msec,
327 ± 28msec, 331 ± 42msec , 322 ± 28msec,
324 ± 26msec, 326 ± 28msec, 332 ± 30msec, 333 ± 34msec
. GFPM P300 323 ± 24msec,

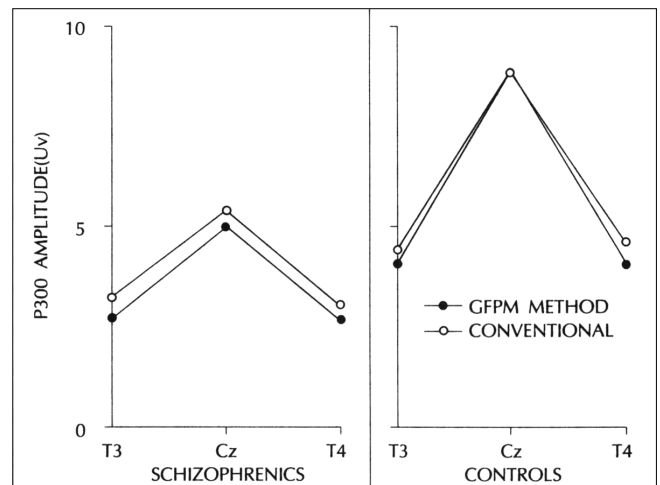


Fig. 2. P300 Amplitudes of transverse electrodes by Global Field Power Measurement and Conventional Method in schizophrenics and normal controls.

331 ± 30msec

(Group effect :

F(1, 38) = 0.17, p = 0.68). GFPM

5

가 (Latency effect : F(5, 190) = 2.8, p = 0.02),

(Latency effect : F(5,

P300

P300

고찰

. GFPM

P300

Sutton (1965)

P300

가

, Polich(1992, 1996, 1998,

가

1999)가

가

P300

P300

5

(selective attention para-

P300

GFPM

digm)

“oddball paradigm”

P300

P300

가

가

P300

Cz

Pz

300msec

가

가

(parameter)

가

가

P300

가

P300

P300

(

1999 ;

1997,

Lehmann Skrandies(1980)

1998) 가

P300

GFP

Ma-

, GFPM

urer Dierks(1991)

P300

가

GFPM

(1997, 1998, 1999)

GFPM

가

가

가

, GFPM

P300

Rodin(1990, 1991)

가?

GFPM

가

GFPM

GFP

P300

가

가

P300

P300

가?

가

(

1998).

가

. GFPM

GFPM

P300

1

X - Y

2

Pz

(3, 2), Cz

(3, 3)

. Morstyn (1983)

(T₃) P300

(Strik 1994a, 1994b). , GFPM

(T₃, TCP₁) P300
(Faux 1990, 1993 ; Hollinger 1992 ;
McCarley 1993 ; Salisbury 1994, 1996, 1998, 1999)
Pfefferbaum (1989)
(Ford 1994, 1999a).
P300
가
(McCa-
rley 1991 ; Pfefferbaum 1991).
가
(McCarley 1993).
가
(Salisbury 1994).
P300
P300 , Cz, Pz 가
MRI
, T₃ T₄ P300 Cz
Pz P300
가
(Group x Lateral
Electrode) (F(2, 76) = 5.66, p<0.01), 가
Cz
T₃ T₄
가
P300 가 Fz 가
가
GFPM
가 P300
가
GFPM
가
가

가

중심 단어 : P300

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