

정신분열병과 기능 자기공명영상

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Functional Magnetic Resonance Imaging and Schizophrenia

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ABSTRACT

Objectives : Functional magnetic resonance imaging(fMRI) is one of the most useful techniques for assessing localized changes in cerebral blood flow and oxygenation using diverse challenge paradigms. This review presents the results of fMRI studies relating to schizophrenia.

Methods : Several fMRI articles on this subject in psychiatric journals were surveyed.

Results : Even with some methodological limitations, most studies showed activity differences between schizophrenics and control subjects.

Conclusion : fMRI extends our understanding of the pathophysiological basis of schizophrenia and offer an opportunity for the assessment and management of its pathology.

KEY WORDS : fMRI · Schizophrenia.

서 론

가 .¹⁾

(MRS),

(PET),

(SPECT)

(Functional Magnetic Resonance Imaging : fMRI) ,

2)

(血力學的)

가

fMRI

10

3)

*가

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50msec

Echoplanar imaging

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가

.⁴⁾

fMRI 가 . Braus Kumari airpuff
 16) sequential finger prepulse PPI
 PPI
 opposition () ,
 , fMRI 가
 SMA fMRI 가 . PPI
 25)
 가 PPI ,
 가 fMRI 26-32) fMRI
 PPI
 fMRI 가 .
 , Schroder 17)
 /

3. 고위 인지기능 장애

variability) 가 (performance fMRI 가
 가 fMRI 가
 SMA 가 .
 가
 가

Muller 18)
 , olanzapine , haloperidol
 finger tapping
 (pallidum) 가 .
 가 , 17)19)
 가

1) Verbal fluency 과제

Yurgelun - Todd 33)34)
 word generation
 fMRI 가
 가 .
 Curtis 35) 가 verbal fluency
 (背外)
 fMRI 가
 가 가
 가 . Yurgelun - Todd
 34)

2. Prepulse inhibition(PPI) 이상

PPI (prepulse) 30~500ms

20)
 .
 21) PPI 가
 22)
 23)24)
 .
 verbal flu-
 ency semantic decision
 verbal fluency
 가 , , fMRI
 가 semantic decision 36)
 가 .

가
 50)
 51)
 fMRI verbal fluency
 52)53)
 가
 Lewis 37) PET fMRI working memory
 verbal fluency
 Sommer 38) Weinberger 54)
 verb generation Two-back working memory
 semantic decision 가
 fMRI 가 PET SPECT
 Spence 40) PET Crow 39) hypofrontality 43)44) Callicott 55)
 Stevens 56)
 Barch 57)
 가 working memory
 A - X continuous performance test(CPT)
 가
 Sommer 41)
 가
 가

2) Verbal memory 과제

Verbal recall word generation 가 58)
 Yurgelun - Todd 42) Gruber 43)
 verbal recall 2 - back
 fMRI 가
 Yurgelun - Todd 42) 가
 44) Baird Volz 59)
 (Wisconsin card sorting test)
 가
 MRI 7)45) 가 verbal memory 가
 Weiss 46) PET 가
 가 60)

3) Working memory 과제

working memory가 hyperfrontality
 47 - 49)
 working memory Manoach 61) Ste-

rnberg Item Recognition Paradigm

fMRI
가
가
가 working memory
hypofrontality가
가
가
Callicott ⁶²⁾
working memory
가
가 hyperfrontality가
가 fMRI가
가
가
Walter ⁶³⁾
verbal, spatial working memory
가
가 verbal
가 working memory
가
가
noach ⁶⁶⁾ ⁶¹⁾
가 working memory
가 가
working memory
hypofrontality
hypofrontality
가
hypofrontality
가
working memory
가
Liddle ⁶⁴⁾ N-back working memory
가
가 가
가 CPT
가
Stevens ⁵⁶⁾ tone serial position (work-
ing memory)
가
가
가
CPT

가, fMRI 가 가 ,
 가 . fMRI 가
 - Working me- 가 fMRI
 mory 가 가
 Stevens 56) Quintana 73)
 Hariri 74)

4) 항정신병약물

(identity)
 fMRI 가
 fMRI 가 가
 Braus 68)

fMRI 가 fMRI
 Honey 69) working me-
 risperidone 가 가
 memory Yurgelun - Todd 70) Kosaka 75)
 fMRI

verbal fluency 가 가 가
 fMRI 가 가 가
 가 가 76)77) 가
 가 fMRI 78)

4. 얼굴 감정 감별 장애

Hempel 79) Ekmana Fri-
 esen 80) fMRI
 가 가 가
 71) 가 가 가

Phillips 72) 가 가 가
 4가 가 가 가
 (fear), (anger), (dis-
 gust), (happiness) fMRI Gur 81)
 가 가

fMRI 가
 가 fMRI
 가 가
 5. 환 청 가

가 , , , 가

가 (self-monitoring) (outer speech) 가 (inner speech) 82) 가 가 89)90)

Woodruff 83) 가 fMRI 가 가

6. 형식적 사고 장애(Formal Thought Disorder : FTD) 7

Kircher 91) Liddle 7

Thought and Language Index 92)

FTD 가 fMRI FTD 가

fMRI 가 PET

93) FTD 가

94 - 96)

Wernicke (Wernicke)) 가

FTD FTD

가 , Djerks 가

85) Heschl () 가

Lennox 84) 가

결 론

fMRI 가

가 Lawrie 86) Hayling fMRI 87)

Lennox 97)

Shergill 88) 가 가 fMRI

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