

Brain-Derived Neurotrophic Factor(BDNF) Val66Met 유전자 다형성과 성격 특성에 대한 연합연구

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An Association Study of the Brain-Derived Neurotrophic Factor Genes Polymorphisms and Personality Traits

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ABSTRACT

Background : Brain - derived neurotrophic factor(BDNF) genes are thought to be important factors in some personality traits. The goal of this study was to determine the role of these genes in personality traits.

Method : The participants included 170 healthy adults with no history of psychiatric disorders and other physical illnesses for the last 6 months. All participants were tested by the Temperament and Character Inventory (TCI). BDNF Val64Met gene polymorphisms were analyzed with PCR(Polymerase Chain Reaction). Differences on TCI dimensions and sub - scales among groups were examined with ANOVA.

Result : There was a significant correlation between BDNF Val64Met and Persistence(PS)($p=0.036$) in female subjects, but none with the other TCI dimensions. A post - hoc comparison revealed significant a difference between Val/Val and Met/Met ($p=0.031$).

Conclusion : Our study suggests that the BDNF Val64Met gene polymorphism is associated with persistence in Korean female subjects, but the small number of subjects limits generalization of our results. Further studies with a larger number of homogenous subjects are needed to confirm whether the BDNF gene is related to personality traits.

KEY WORDS : Temperament and character inventory · Brain - derived neurotrophic factor · Personality traits · Genetic polymorphism.

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서 론

30~60%가
1) Cloning가 2)
가
D4 (dopamine receptor D4, DRD4)³⁾ 5-
HTTLPR(serotonin transporter gene - linked poly-
morphic - region)⁴⁾ 5)
6) 7)
Brain - derived neurotrophic factor(BDNF)
BDNF chromosome 11p14.1
8)9) BDNF 10)11)
12) 13)
BDNF 가
가
BDNF가 (dorsal raphe)
(firing pattern)
14)
BDNF가 가
가
, BDNF가
Itoh 15) BDNF 196 G/A
(Temperament and Cha-
racter Inventory, TCI) (reward
dependence, RD), NEO (NEO Perso-
nality Inventory, NEO - PI) (extraversion)
, Lang 16) BDNF
Val66Met
Tsai 17)
BDNF
가 12 3%

연구대상 및 방법

1. 연구대상

2003 , 2004 1
170 1)
가 , 2)
3) DSM - I 가

2. 연구방법

1) 유전자형 분석

10cc DNA
DNA Purification kit
(GENTRA) Human genomic
DNA genomic DNA 가
BDNF G196A(Val66Met)
oli-
gonucleotide primer()
Forward : 5' - GAGGCTTGACATCATTGGCT - 3'
Reverse : 5' - CGTGTACAAGTCTGCGTCCT - 3'
PCR tube DNA 50ng, 10 × Taq buffer(500Mm
KCl, 100Mm, Tris - HCl, pH 8.3 and 15mM MgCl₂)
3 μl, 2.5mM dNTP 2.4 μl, (10pmol/ μl)
1 μl, Taq polymerase(5U/ μl) 0.5 μl
30 μl Ther-
mercyker(Takara, Japan)
. 94 5 , 94
30 , 60 30 , 72 30 33
, 72 5
4
Eco721(MBI Fermentas)
Eco721 3U 37

agarose gel 0.5 ng/ml EtBr(Ethidium bromide) 22.53 ± 1.98, 22.08 ± 1.53
 .196 가 A(66Met) Weinberg (1). BDNF Hardy -
 가 113bp가 , G(66Val) 17) 16)
 78 35bp .

2) 성격 특성 평가

Cloninger 18) TCI ,
 .19 TCI 240
 , “ - ”
 . TCI
 (novelty seeking, NS), (harm
 avoidance, HA), RD (persistence,
 PS) 4가 (temperament dimen-
 sion) (Self - directedness, SD),
 (Cooperativeness, CO) (Self -
 transcendence, ST) 3가 (cha-
 racter dimension)

3) 통계분석

TCI ANOVA
 test SPSS/PC+
 version 10.0 , 0.05

결 과

170 (140 , 66)

BDNF TCI
 가 BDNF
 PS 가
 (P by genotype, Val/Val, Val/Met, Met/Met :
 one - way ANOVA : $F=3.514, p=0.036$)(2).
 Val/Val Met/Met
 (one - way ANOVA with Bon-
 ferroni, $p=0.031$). , BDNF Val/Val Met/Met

Table 1. Allele and genotype frequencies of the BDNF gene polymorphism at position 170 in male and female subjects

	Male (n=104)	Female (n=66)
BDNF allele frequency		
Allele Val	110(57.7%)	79(60.0%)
Allele Met	98(42.3%)	53(40.0%)
$\chi^2=1.535, df=2, p=0.464$		
BDNF genotype		
Val/Val	30(29.8%)	24(36.4%)
Val/Met	50(48.0%)	31(46.9%)
Met/Met	24(22.2%)	11(16.7%)
$\chi^2=1.586, df=1, p=0.208$		

Table 2. TCI scores in male and female healthy subjects

Genotype(n)	NS	HA	RD	PS	SD	CO	ST
Male(104)							
Val/Val(30)	17.2(6.39)	15.5(6.76)	15.1(2.95)	4.87(2.08)	25.0(5.06)	28.9(7.03)	13.0(6.67)
Val/Met(50)	17.5(5.19)	15.6(5.15)	15.0(3.78)	4.92(2.14)	24.7(7.61)	27.9(6.98)	12.8(6.07)
Met/Met(24)	16.4(6.41)	16.3(7.45)	14.3(3.70)	4.67(1.79)	24.0(7.38)	27.7(8.03)	12.5(6.21)
F	0.324	0.110	0.383	0.127	0.153	0.263	0.037
P	0.724	0.896	0.683	0.881	0.858	0.769	0.964
Female(66)							
Val/Val(24)	17.1(6.63)	17.8(6.73)	16.2(5.00)	5.75(1.87)	26.3(6.84)	29.6(7.85)	13.9(5.29)
Val/Met(31)	17.0(6.21)	16.2(6.87)	16.2(4.13)	5.03(2.21)	25.4(8.13)	31.0(6.57)	15.4(4.90)
Met/Met(11)	16.1(5.39)	19.4(5.22)	16.0(3.0)	3.73(2.24)	23.7(8.06)	27.5(4.06)	14.5(4.80)
F	0.112	1.060	0.010	3.514	0.408	1.122	0.620
P	0.894	0.353	0.990	0.036	0.666	0.332	0.541

* : Data are presented as means(standard deviation)

가 PS
 $5.75 \pm 1.87, 3.73 \pm 2.24$.
 고 찰
 Cloninger , , , ,
 (power) 가
 가
 Shimizu
 BDNF
 24) , ,
 (allele frequency)
 가 Val/Val
 18) 33.8% , 48.7%,
 170 BDNF
 68.4% , BDNF
 Val64Met 가 .
 TCI
 PS BDNF
 . PS
 Tsai 17)
 RD . PS 가
 , , , , ,
 , 가 , 가 11
 PS
 가
 , DRD4 5 -
 HT_{2c} ,²⁰⁾ DRD2 BDNF
²¹⁾ DRD4²²⁾ .
 Lang 16) BDNF 196G/A
 RD . 가 .
 BDNF
 (gen-
 der) . Cloninger 가 18)
 NS , HA , RD
 BDNF 가 .
 BDNF PS 가
 Tsai 17)
 BDNF Val66Met

중심 단어 : Brain - derived neurotropic factor .

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