

항정신병 약물과 혈당조절이상

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Antipsychotics and Abnormality in Glucose Regulation

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ABSTRACT

Objective : The purpose of this study was to know about the mechanism of pathogenesis of type 2 diabetes mellitus by using of blood glucose, glucoregulatory factor, insulin resistance in schizophrenic patients receiving antipsychotics.

Method : Modified oral glucose tolerance tests were performed in 20 schizophrenic patients receiving haloperidol, risperidone and olanzapine. Insulin, glucagon, C-peptide and cortisol were measured in 0, 15, 45, 75 minutes after glucose loading, and insulin resistance was calculated by HOMA(homeostasis model assessment) method.

Result : Olanzapine-treated patients had significant glucose elevation 45 minutes after glucose challenge. Also modest increases in HOMA IR values were detected in patients treated with olanzapine.

Conclusion : Olanzapine treatment of non-diabetic patients with schizophrenia can be associated with type 2 diabetes mellitus through the elevation of glucose and insulin resistance. Elevated insulin resistance may be a causative mechanism of type 2 diabetes mellitus in patients receiving olanzapine.

KEY WORDS : Antipsychotics · Blood glucose · Insulin resistance.

서 론

가 Hiles(1956)
Arneson(1964) phenothiazine
, Thonnard - Neumann(1956)

가 1
8)17)37)40) 2 100mg chlorpromazine
4.2% 17.2%

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가 ' Phenothiazine diabetes '

2

(ANOVA) , ANOVA
 Bonferroni - Dunn post hoc test (1)(p=0.02), Bonferroni - Dunn post hoc test
 OGTT 45 olanzapine
 risperidone olanzapine
 p 0.05 가 (p=0.023),
 haloperidol olanzapine , haloperidol
 risperidone

결 과

1. 조사 대상군의 특성
 35.2 ± 10.4
 6.56 ± 6.5 ,
 25.09 ± 39.6 ,
 halo-
 peridol 9.93 ± 7.59mg, risperidone 4.71 ± 1.70mg,
 olanzapine 20.00 ± 0mg
 21.63 ± 2.76 haloperidol 21.01 ±
 1.57, risperidone 21.22 ± 3.64, olanzapine 22.
 84 ± 2.76 ,

2. 자료의 분석

1) 혈당의 비교

OGTT 45 haloperidol risperidone , olanzapine
 144.28 ± 22.46mg/dl,
 116.57 ± 16.45mg/dl, 156.66 ± 30.18mg/dl

OGTT 45 OGTT 0 , 15 olanzapine
 가 , 75

2) 인슐린의 비교

haloperidol risperidone , olanzapine
 8.31 ± 2.46 μIU/ml, 5.69 ±
 2.42 μIU/ml, 10.41 ± 1.88 μIU/ml ANOVA
 (2)(p=
 0.006), Bonferroni - Dunn post hoc test
 olanzapine
 risperidone
 (p=0.005), haloperidol olanza-
 pine , haloperidol risperidone
 OGTT

Table 1. Fasting and postload plasma glucose level (mg/dl)

Time	Haloperidol group (N=7)	Risperidone group (N=6)	Olanzapine group (N=6)	F	P
Baseline	86.57 ± 9.57	93.00 ± 12.59	97.33 ± 7.25	1.849	0.188
15min	113.14 ± 25.28	129.42 ± 27.27	141.16 ± 24.18	1.960	0.171
45min	144.28 ± 22.46	116.57 ± 16.45	155.66 ± 30.18	4.952	0.020*
75min	134.00 ± 29.58	131.85 ± 32.46	128.83 ± 14.67	0.058	0.944

N : numbers of patients

Table 2. Fasting and postload plasma insulin level (μIU/ml)

Time	Haloperidol group (N=7)	Risperidone group (N=6)	Olanzapine group (N=6)	F	P
Baseline	8.31 ± 2.46	5.69 ± 2.42	10.41 ± 1.88	6.923	0.006*
15min	19.03 ± 15.52	37.25 ± 42.83	28.47 ± 21.42	0.670	0.525
45min	42.80 ± 28.61	40.86 ± 35.27	66.21 ± 40.12	1.045	0.373
75min	41.27 ± 27.29	24.03 ± 15.72	27.14 ± 22.64	1.165	0.336

N : numbers of patients

Table 3. Fasting and postload plasma cortisol level(μ g/dl)

Time	Haloperidol group(N=7)	Risperidone group(N=6)	Olanzapine group(N=6)	F	P
Baseline	16.44 \pm 7.92	17.10 \pm 7.36	12.76 \pm 3.55	0.766	0.480
15min	21.06 \pm 6.60	24.29 \pm 7.76	18.91 \pm 4.97	1.092	0.358
45min	20.53 \pm 5.17	22.49 \pm 3.73	17.71 \pm 4.10	1.918	0.177
75min	16.76 \pm 5.80	16.07 \pm 3.93	15.17 \pm 5.13	0.162	0.851

N : numbers of patients

Table 4. Fasting and postload plasma glucagon level(pg/ml)

Time	Haloperidol group(N=7)	Risperidone group(N=6)	Olanzapine group(N=6)	F	P
Baseline	212.76 \pm 96.52	203.59 \pm 34.81	158.76 \pm 54.69	1.148	0.341
15min	249.14 \pm 76.96	422.12 \pm 243.15	232.89 \pm 53.40	3.132	0.070
45min	385.95 \pm 264.43	464.04 \pm 316.05	251.57 \pm 90.02	1.185	0.330
75min	309.39 \pm 197.79	384.86 \pm 249.01	269.78 \pm 45.74	0.648	0.536

N : numbers of patients

Table 5. Fasting and postload plasma C-peptide level(ng/ml)

Time	Haloperidol group(N=7)	Risperidone group(N=6)	Olanzapine group(N=6)	F	P
Baseline	1.28 \pm 0.72	1.58 \pm 0.77	2.01 \pm 0.27	2.063	0.158
15min	2.37 \pm 1.22	3.96 \pm 2.81	3.45 \pm 1.52	1.153	0.339
45min	5.42 \pm 2.71	5.94 \pm 3.49	8.16 \pm 3.82	1.192	0.328
75min	5.83 \pm 2.34	4.49 \pm 2.12	6.84 \pm 5.77	0.680	0.520

N : numbers of patients

Table 6. HOMA-IR

	Haloperidol group(N=7)	Risperidone group(N=6)	Olanzapine group(N=6)	p=0.002*
HOMA-IR	31.94 \pm 10.20	22.82 \pm 7.21	45.44 \pm 12.97	

N : numbers of patients

- 3) 코르티졸, 글루카곤 (6)(p=0.002), Bonferroni-
 olanzapine
 olanzapine
 (3, 4).
 (p=0.002),
 olanzapine
 (p=0.062).
 4) C-펩타이드의 비교
 risperidone
 haloperidol
 risperidone haloperidol
 가 (5).
 5) HOMA로 본 인슐린 저항성의 비교
 Haloperidol , risperidone , olanzapine HO-
 MA - IR 31.94 \pm 10.20, 22.82 \pm 7.21, 45.
 44 \pm 12.97 ANOVA
 6) 혈당, 시간, 체질량 지수, 나이와의 상관성
 OGTT 0 , 15 , 45 , 75 ,
 , C- , ,

가

고 찰

2)7)10)48)49)

clozapine olanzapine 가 가
. Clozapine

. 1995 National Health Interview Survey

18 44 가
1.2% 45 64 6.3% ,⁶⁾ Harris 가
(1998) 7.8% Leadbetter (1992)

noradrenergic, serotonergic

. Mukherjee (1996) 95
15.8% ,
Dixon (2000) 14,182
2
14.9% 10%

Kinon (2001) olanzapine 573
haloperidol 103
1.15 39

가 가 2
가 .¹⁵⁾

olanzapine 가가 6.26
0.69 가 haloperidol

.³⁵⁾

olanzapine 가
⁵⁾²⁴⁾²⁸⁾⁵⁵⁾ Wirshing (1998) olanzapine
가 histamine serotonin 2C
. Risperidone

가 가 가 가
, 2 1
. clozapine olanzapine risperidone

pine ziprasidone 가
¹²⁾³⁸⁾ quetia-
가

.¹⁾¹³⁾²¹⁾⁴³⁾³²⁾³⁵⁾⁴⁴⁾

가 .⁹⁾¹⁴⁾⁴¹⁾⁴⁷⁾
2 가

가 가 2 2 가
가 가 가

가 가 2
가가 2

가 가 ,

가 .⁴²⁾ 가

가 가 ,

Homeostasis model

요약

연구목적 :

가 2

방법 :

20

haloperidol, risperidone, olanzapine

3

(modified oral glucose tolerance test : OGTT)

, C-

HOMA

(homeostasis model assessment)

결과 :

Olanzapine OGTT 45

risperidone

가

HOMA

olanzapine

risperidone

결론 :

Olanzapine

2

가

가

olan-

zapine

2

중심 단어 :

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