

## 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(  $\mu$  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).  
 haloperidol  
 risperidone haloperidol
- 4) C-펩타이드의 비교  
 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

### 고찰

2)7)10)48)49)

clozapine olanzapine 가 가  
. Clozapine

. 1995 National Health Interview Survey

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

noradrenergic, serotonergic

. Mukherjee (1996) 95  
15.8% ,  
Dixon (2000) 14,182  
2  
14.9% 10% ,  
가 가 2  
가 가 .<sup>15)</sup>

Kinon (2001) olanzapine 573  
haloperidol 103  
1.15 39  
olanzapine 가가 6.26  
0.69 가 haloperidol

.<sup>35)</sup>

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

가 가 가 가  
, 2 1  
. clozapine olanzapine risperidone

pine ziprasidone 가  
<sup>12)38)</sup> quetia-  
가

.<sup>1)13)21)43)32)35)44)</sup>

가 .<sup>9)14)41)47)</sup>

가 가 2 2 가  
가 가 가  
가 가 가가 2

가 가

가 .<sup>42)</sup> 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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