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Psychophysiological Differences in Patients With/Without Schizophrenia: A Comparative Study

Theofilidis Antonis*, Fountoulakis Konstantinos

3rd Department of Psychiatry, Faculty of Medicine, School of Health Sciences, Aristotle University of Thessaloniki, Greece.

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***Corresponding author:** Antonis Th. Theofilidis, Karatza 12, 55 132 Kalamaria Thessaloniki -Greece.

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Abstract

Background: Schizophrenia is a chronic and severe mental disorder affecting 20 million people worldwide. Characterized by distortions in thinking, perception, emotions, language, sense of self and behaviour.

Objective: Differences in body mass index, weight and height, in patients with schizophrenia, mood disorders vs. normal controls.

Method: The study sample included 76 patients with unipolar depression, 16 patients with schizoaffective disorder, 122 patients with schizophrenia, and 78 patients with other mental disorders, and 788 subjects normals as a control group

Results: Significant differences in terms of height between unipolar depressive males and normal females ($p<0.05$), normal males ($p<0.05$), and males with schizophrenia ($p<0.05$), with unipolar depressive patients being shorter in comparison to the other groups. In terms of weight no significant differences were among groups.

Conclusions: This analysis provides evidence that female patients with schizophrenia are significantly heavier than the general population.

Key Words: schizophrenia; body mass index

Introduction

Increase in body weight was observed in more than 50% of schizophrenic patients who receive antipsychotic drugs in general. Body mass index (BMI) is significantly higher in schizophrenic patients compared to psychiatric patients with other diagnosis and to the general population (Allison et al. 2001). Additionally, increased body weight is also associated with reduced self-esteem, treatment dropout, (Gama, Souza, Lobato & Abreu, 2004; Bernstein, 1987) and increased risk of comorbid conditions The evidence report, 1998). Data from the Brazilian Ministry of Health show a prevalence of 32% for overweight and 8% for obesity in the general population (Baptista, 1999).

What is more, Schizophrenia has long been known to be highly genetic; it often runs in families. A large genome-wide association study of people with schizophrenia, published in 2014, linked the disorder to small DNA variations at more than 100 distinct locations on the human genome, which is the complete set of DNAs for humans (Geschwind, 2014).

Based on the extensive evidence of weight gain associated with antipsychotic drug use and on the lack of specific studies in schizophrenic patient, a study was carried out for the assessment of differences in weight and obesity among patients with schizophrenia, mood disorders versus normal controls.

The main aim of this study is to observe and compare the BMI differences among patients with schizophrenia, mood disorders versus normal controls.

Material and methods

A. Study sample

The study sample included 1116 subjects, of which 788 were normal control subjects, 76 patients with unipolar depression, 16 patients with schizoaffective disorder, 122 patients with schizophrenia and 78 patients with other mental

a mixture of severe forms of OCD, psychotic and mood disorders other than the before mentioned as well as severe personality disorders. There were no alcohol or substance abuse cases. The gender and age composition of the sample is shown in table 1. All patients were inpatients or outpatients of a private mental hospital. All control subjects and patients gave informed consent and the protocol received approval by the University's Ethics Committee.

	Normal N=788		Unipolar depression N=76		Bipolar N=36		Schizoaffective N=16		Schizophrenia N=122		Other mental disorder N=78		
	females	males	females	males	females	males	females	males	females	males	females	males	All Groups
N	461	327	54	22	19	17	14	2	49	73	39	39	1116
Age													
Mean	39.33	42.04	52.11	57.27	49.58	40.76	45.43	34.00	36.02	32.73	45.31	44.13	41.16
Std Dev	11.18	12.28	12.70	12.58	12.70	12.35	15.19	8.49	11.47	8.31	17.66	16.58	12.84
Height													
Mean	164.98	176.94	161.59	170.55	164.00	173.65	159.93	178.00	165.39	177.90	165.05	175.51	169.74
Std Dev	5.61	6.67	6.35	5.64	4.86	7.28	5.80	0.00	6.17	7.81	8.57	7.38	8.78
Weight													
Mean	65.49	83.19	72.80	77.41	75.21	83.82	70.14	81.50	69.33	81.96	68.69	81.51	73.71
Std Dev	12.32	12.54	13.11	13.86	17.47	12.57	12.37	2.12	15.49	14.95	18.44	14.61	15.42
BMI													
Mean	24.09	26.54	27.98	26.56	27.84	27.80	27.43	25.73	25.36	25.91	25.10	26.36	25.50
Std Dev	4.50	3.55	5.29	4.13	5.72	4.02	4.60	0.67	5.51	4.61	6.06	3.87	4.57

	Wilks	F	Effect df	Error df	p
age	0,832	73,94	3	1101	>0,001
diagnosis	0,976	1,82	15	3040	0.027
sex	0,997	1,09	3	1101	0.351
diagnosis*sex	0,972	2,1	15	3040	0.008

B. Clinical diagnosis

The diagnosis was put according to DSM-IV-TR criteria on the basis of a semi structured interview based on the Schedules for Clinical Assessment in Neuropsychiatry version 2.0 (SCAN v 2.0) (1).

C. Somatometric measurement

The height and weight of all control subjects and patients was measured. The subjects' weight was measured with standardized weighting machines so as to have a reliable measurement and comparable across machines. BMI was calculated as the ratio of weight in kilograms to the square of height in meters. The means and standard deviations of the subgroups of the study sample are shown in table 1.

D. Statistical analysis.

The first step in the analysis was to transform the data (shown as means and standard deviations in table 1) to percentile scores. The Rank and Percentile method was used.
The statistical analysis of percentiles included Multiple Analysis of Covariance (MANCOVA) with diagnosis and gender as grouping variables, age as covariate and height, weight and BMI as dependent variables. The Scheffe was used as post-hoc test analysis (2)

Results

The MANOVA results suggested an effect of age ($p<0.001$) and diagnosis ($p<0.05$) but not of sex ($p>0.1$) but also of the interaction between diagnosis and sex ($p<0.01$). The detailed results are shown in table 2.
The scheffe test revealed significant differences in terms of height between unipolar depressive (UD) males and normal females ($p<0.05$), normal males ($p<0.05$), and males with schizophrenia ($p<0.05$), with unipolar depressive patients being shorter in comparison to the other groups. In terms of weight there were no significant differences among groups. In terms of BMI, UD females had significantly higher BMI in comparison to normal females ($p<0.001$) and males with schizophrenia ($p<0.05$). The detailed descriptive statistics of the study sample characteristics are shown in table 2.

Discussion - Conclusions

The main findings of this study were: unipolar depressive patients being shorter in comparison to the other groups. In terms of weight there were no significant differences among groups. In

terms of BMI, UD females had significantly higher BMI in comparison to normal females and males with schizophrenia Sample results show that the overweight and obesity problem affects both patients with schizophrenia and mood disorders. This aspect is apparently in opposition to several studies showing increased weight gain with the use of second-generation antipsychotics, compared to first-generation antipsychotics. Most evidence reported in the literature is based on case-control studies, pharmacovigilance and database reviews. Many of them present disadvantages, such as their retrospective nature, heterogeneous methodology, presence of systematic assessment errors and lack of adequate or well-characterized controls (American Diabetes Association, 2004).

Antipsychotics, both typical and atypical, produce weight gain, although it is difficult to differentiate weight gain patterns between these drugs. Although weight gain represents a collateral effect commonly reported for antipsychotic drugs, it seems to be more common in patients taking atypical antipsychotics (Bobes et al. 2003).

Meta-analyses, literature reviews, data from clinical trials and clinical experience show that some patients present a significant weight gain while taking antipsychotics. An extensive meta-analysis, including more than 80 studies and more than 30,000 measurements, has associated clozapine, as well as olanzapine, with more weight gain compared with other antipsychotics (typical and atypical) (Wirshing et al. 2014),
Patients with schizophrenia are aware of their actual weight. It has been suggested in the literature that overweight and obesity have the same impact on their self-esteem and well-being as the in general population (Strassnig et al., 2005; Awad and Voruganti, 2004). Strassnig et al. (2005) and Weiden et al. (2004) suggest that patients with schizophrenia are less capable to manage their weight gain through exercise and dietary changes and thus can be more prone to be noncompliance with medication that induces weight gain versus the control group.

Due to the study design, there are limitations associated with cross-sectional studies collecting data from chronic patients with long lasting illnesses using different drugs throughout the treatment and with poor medical records about weight. Additionally, drug type, dose and duration of use were not specified, neither there was any control of cultural, social, genetic and psychological variables associated with eating behavior, consumption and energy expenditure (Wilson & Fairburn, 1993). Despite the limitations, it is important to stress that the findings in this study allow us to state that schizophrenic patients, under continued use of antipsychotics are at higher risk for obesity and deserve clinical, nutritional, psychiatric and psychological attention, since obesity is a risk factor for several health problems that increase morbidity and mortality rates.
In this context, the authors warn about the necessity of more detailed studies, including higher number of subjects and with better information about previous treatment, in order to disentangle the process and magnitude of weight gain between different neuroleptics, with the identification of interactions with other drugs, especially anticonvulsants and antidepressants, and assessment of the residual effect of a drug over the subsequent one.

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