

Retrospective Comparison of Weight Gain between Olanzapine- and Risperidone-Treated Patients

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ABSTRACT

Background and Objectives: Weight gain as a side effect of the second generation antipsychotics have been increasingly noted during therapy; however no studies addressed such a valid clinical concern in Iraq till now. The objective of this study was to determine the weight changes among patients treated with either Olanzapine or Risperidone.

Methods: A retrospective study was performed by reviewing the charts of 80 patients who have been treated with Olanzapine monotherapy (60 patients) or Risperidone monotherapy (20 patients) through the period of April 2008 to April 2009, comparing the baseline weight in kilograms with after one month of therapy weight.

Results: Among the 60 patients treated with Olanzapine, 42 (70%) gained weight, 70.37% of males and 69.69% of females treated with Olanzapine gained weight. Among the 20 patients treated with Risperidone, 12 (60%) gained weight, 50% of males and 75% of females treated with Risperidone gained weight. Those treated with Olanzapine, gained 3.96 kg after 30 days of treatment, while the amount of gain was 2.25 kg among those treated with Risperidone after the same period. Olanzapine-treated group gained about 6.21% of their baseline weight which was significantly higher than that of Risperidone-treated group who gained about 2.89% of their baseline weight (P value of 0.03). Females gained more amount of weight than males in both group.

Conclusions: Both second generation antipsychotics, Olanzapine and Risperidone, are associated with weight gain. However, Olanzapine appears to have a greater potential in inducing weight gain. Both genders affected nearly equally, though females were victims of more amount of weight gain.

Key words: Second Generation Antipsychotics, Obesity, Olanzapine, Risperidone.

INTRODUCTION:

Antipsychotics are an important therapeutic option for many individuals with schizophrenia and other psychoses, as well as for several other non psychotic mentally disordered. The beneficial effects of atypical antipsychotics on positive symptoms, negative symptoms, and cognition in schizophrenia, as well as the reduced rate of extra-pyramidal effects have led to the wide use of these drugs in clinical practice^{1,2}. However, their administration might lead to a marked increase in body weight in ,

addition to metabolic abnormalities³⁻⁹. Obesity in addition to be a growing problem in the general population worldwide, presents at even greater rates among schizophrenic patients^{10,11}. Many factors contribute¹², including lack of exercise¹³, lack of adequate medical care¹⁴, and a possible predisposition toward weight gain in general¹⁵, or in association with improvement of symptoms^{5,16}. Weight gain associated with antipsychotic treatment has been commonly reported^{2,17}. Antipsychotic-drug induced weight gain has a number of meaningful clinical implications, particularly

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in the long-term management of schizophrenia. In addition to its effect on general health risks, weight gain has a major impact on the subjective acceptance of these drugs and thereby on adherence to the medications¹⁸. Substantial body weight gain occurs in up to 50% of patients during long-term antipsychotic treatment¹⁹. Second-generation antipsychotics can cause large increases in body weight; clozapine and olanzapine appear to cause the most weight gain, risperidone is associated with intermediate weight gain, and ziprasidone is associated with less weight gain than haloperidol^{3, 20, 21}.

Objectives: the main objective of the study was to compare the evidence of weight gain, as a side effect, between those who treated with Olanzapine and those who treated with Risperidone. Moreover, the author tried to find out the effect of gender for such a side effect within each group.

MATERIALS AND METHODS:

A one year retrospective study was performed by reviewing charts of patients at Hawler Teaching Hospital, both psychiatric out-patient and in-patient units, in Erbil city, who were treated between April 2008 and April 2009, comparing the baseline weight in kilograms with after one month (30 ± 5 days) weight in those who treated with either Olanzapine or Risperidone. Data were analyzed by gender differences.

Inclusion criteria: Included for analysis were patients treated with either Olanzapine or Risperidone alone (mono-therapy), with baseline weight records (before starting therapy) in kilograms, and only those who have been followed for their weight changes by the same weight scale measure. The last criterion included to avoid different raters variability among the scale measures. 1017 patient charts have been reviewed by the author, only 80 patient charts fulfilled the inclusion criteria, 60 were treated with Olanzapine (2.5 to 20 milligrams daily) and the remaining 20 patients were treated with Risperidone (1 to 6

milligrams daily). Whole the weight measurements of the 80 patients were carried out by the author and by using the same weight measure instrument of the psychiatric unit mentioned above.

Statistical Analyses: The mean differences between Olanzapine-treated group and Risperidone-treated group, and the mean differences between baseline weight and after one month therapy weight within each group were measured by adopting Student t-tests, unpaired and paired tests relatively, all 2 tailed, with both equal and unequal variances accordingly. For the measurement of variances equality, F-test Two Sample for Variances was adopted. For the paired t-tests, and for purpose of more accurate and complete understanding of the results, 95% Confidence Interval (CI) of the amount of weight gain has been measured to determine the amount of weight change around the mean weight change after one month of therapy. In an attempt to assess the differences in the numbers of patients gained weight in both groups, Chi square test has been applied. The term "statistically significant" applied to a p-value of equal or less than 0.05.

RESULT:

A total of 80 patient charts were reviewed during the mentioned period in this study. The demographic data of age and gender, baseline weight, doses of the antipsychotics and the data of after one month (30 ± 5 days) weight changes are shown in table 1. (Table1) shows that 3.96 kg gain occurred among those treated with Olanzapine, and 2.25 kg gain occurred among those treated with Risperidone, with P value of 0.12. Again (table1) reveals that Olanzapine-treated group gained about 6.11% of their baseline weight, while Risperidone-treated group gained about 2.98% of their baseline weight with P value of 0.03 which is statistically significant.

(Table2) reveals the differences in the number of patients who gained weight between both genders in both treating groups. Among the 60 patients (27 male

and 33 female) who were treated with Olanzapine (mean of 10.91 milligrams daily), 42 patients (70%) {19 males (70.37%) and 23 females (69.69%)} gained variable amounts of weight during one month of therapy. Among the 20 patients (12 male and 8 female) who were treated with Risperidone (mean of 4.2 milligrams daily), 12 patients (60%) {6 males (50%) and 6 females (75%)} gained variable amounts of weight during one month of therapy. In an attempt to test any significant differences between the same gender of both groups, Chi square test applied, which returned back p-values of (0.2) for males, and (1) for females which are not significant.

(Table3) analyzes the data of those who were treated with Olanzapine. Paired t – test used to test the weight differences before and one-month after therapy, which returned back to be not significant for the total sample (p value = 4.35), males (p value = 1.09), and females (p value = 6.8). In order to make the picture more understandable, the mean amount of gains has been calculated (3.96 kg) with 95% confidence interval about the mean weight gain of 1.09 kg. Same analysis has been done for the percent of weight gain from the baseline weight, with mean of 6.21% of baseline weight and 95% confidence interval about the mean percent of 1.82%. These analyses concluded that for the 60 patients treated with 10.91 milligrams Olanzapine daily, 3.96 ± 1.09 kg (2.85 – 5.05

kg) weight gain occurred, with 4.39% to 8.03% of baseline weight. Although females gained more weight, with more far away percent of baseline, the differences between females and males were assessed, by adopting unpaired t-test, and the p values were not significant (p value = 0.95 and p value = 0.33 respectively).

(Table 4) analyzes the data of those who were treated with Risperidone. Paired t – test used to test the weight differences before and one-month after therapy, which returned back to be significant for the total sample (p value = 0.01), significant for female sample (p value = 0.01), and not significant for male sample (p value = 0.1). In order to make the picture more understandable, the mean amount of gains has been calculated (2.25 kg) with 95% confidence interval about the mean weight gain of 1.92 kg. Same analysis has been done for the percent of weight gain from the baseline weight, with mean of 2.89% of baseline weight and 95% confidence interval about the mean percent of 2.33%. These analyses concluded that for the 20 patients treated with 4.2 milligrams Risperidone daily, 2.25 ± 1.92 kg (0.33 – 4.17 kg) weight gain occurred, with 0.56% to 5.22% of baseline weight. Although females gained more weight, with more far away percent of baseline, the differences between females and males were assessed, by adopting unpaired t-test, and the p values were not significant (p value = 0.63 and p value = 0.36 respectively).

Table 1: Demographic data and data of weight change after one month period of therapy

Antipsychotic	N	Age In years (Mean \pm SD)	Gender Ratio (Male/Female)	Baseline Weight / kg (Mean \pm SD)	After One Month Weight / kg				
					Weight / kg (Mean \pm SD)	Amount of gain / kg	P value	% of baseline weight	P value
Olanzapine	60	33.38 \pm 11.01	27/33	69.01 \pm 15.18	72.98 \pm 15.43	3.96	0.12	6.21	0.03*
Risperidone	20	34.05 \pm 13.12	12/08	77.4 \pm 20.6	79.65 \pm 21.4	2.25		2.89	
Total	80	33.55 \pm 11.5	39/41	71.11 \pm 16.94	74.65 \pm 17.22	3.54		4.98	

*Statistically Significant

Table 2: Gender differences of weight gained patients between Olanzapine-treated and Risperidone-treated groups.

Gender	Weight Gains		
	Olanzapine Induced N (%)	Risperidone Induced N (%)	P value
Male	19 (70.37)	6 (50)	0.2
Female	23 (69.69)	6 (75)	1
Total	42 (70)	12 (60)	0.58

Table 3: One-month Olanzapine-induced weight change according to gender profile.

		Male (N = 27)	Female (N = 33)	Total (N = 60)
Age in years (Mean \pm SD)		33.59 \pm 10.7	33.21 \pm 11.43	33.38 \pm 11.01
Dose of Olanzapine mgs/day (Mean \pm SD)		11.38 \pm 5.64	10.53 \pm 4.75	10.91 \pm 5.14
Baseline weight / kg (Mean \pm SD)		74.3 \pm 13.44	64.7 \pm 15.34	69.01 \pm 15.18
One month changes in weight profile in kilograms	After one month weight / kg (Mean	78.22 \pm 14.67	68.7 \pm 14.9	72.98 \pm 15.43
	P value	1.09	6.8	4.35
	Amount of weight difference /kg (Mean \pm 95% CI)	3.92 \pm 1.56	4 \pm 1.6	3.96 \pm 1.09
	P value	0.95		
	% of baseline weight (Mean \pm 95% CI)	5.26 \pm 2.15	6.98 \pm 2.88	6.21 \pm 1.82
	P value	0.33		

Table 4: One-month Risperidone-induced weight change according to gender profile.

		Male (N = 12)	Female (N = 8)	Total (N = 20)
Age in years (Mean \pm SD)		31.16 \pm 14.60	38.37 \pm 09.79	34.05 \pm 13.12
Dose of Risperidone mgs/day (Mean \pm SD)		4 \pm 2.04	4.5 \pm 1.77	4.2 \pm 1.9
Baseline weight / kg (Mean \pm SD)		81.16 \pm 23.94	71.75 \pm 13.6	77.4 \pm 20.6
One month changes in weight profile in kilograms	After one month weight / kg (Mean \pm SD)	83.08 \pm 25.6	74.5 \pm 12.72	79.65 \pm 21.4
	P value	0.1	0.01*	0.01*
	Amount of weight difference /kg (Mean \pm 95% CI)	1.91 \pm 3.14	2.75 \pm 2.17	2.25 \pm 1.92
	P value	0.63		
	% of baseline weight (Mean \pm 95% CI)	2.04 \pm 3.42	4.17 \pm 3.57	2.89 \pm 2.33
	P value	0.36		

*Statistically Significant

DISCUSSION:

In the present study, charts of 80 patients have been reviewed for the evidences of weight gain after one month therapy with Olanzapine (60 patients) or risperidone (20 patients).

Table 1 shows that weight gain occurs in both groups, but the amount of gain in Olanzapine-treated patients was higher (3.96 kg) than that of Risperidone (2.25 kg). Although the difference was not statistically significant ($P = 0.12$), but the amount of gain according to the baseline weight records was significantly higher in Olanzapine-treated group (6.21% of baseline weight) compared with the Risperidone-treated group (2.89% of baseline weight) with P value of 0.03. Such findings were relevant to other findings elsewhere^{3, 22, 23}. Allison et al (1999)³ reported increases of 4.15 kg with Olanzapine and 2.1 kg with Risperidone during a 10 week period of

therapy in some western countries. Also Basson et al (2001)²² found significant differences in effect of weight change between Olanzapine and haloperidol but not between Olanzapine and Risperidone. Similarly, Kraus et al(1999)²³ observed a mean increase of 3.9kg during four weeks of treatment with Olanzapine. Although many explanations have been proposed for the possible association between the new antipsychotics usage and obesity worldwide, like histamine receptors antagonism²⁴, serotonin receptors antagonism²⁴, increased leptin secretion²³, or sedation and subsequent lack of exercise; yet no clear mechanisms have been proposed to explain the increased potentials of Olanzapine over some other new antipsychotics in inducing weight gain.

Table 2 reveals that males were more affected by the weight gain in Olanzapine-treated group (70.37% of males gained weight) though (69.69% of females gained

weight), the picture was reversed among Risperidone-treated group, where females were more affected by the weight gain (75% of female gained weight, while 50% of males gained weight). In regard to the amount of weight gain in both genders, the current study revealed increased in weight in both genders in both groups. Although statistically not significant, but the study showed that females treated with Olanzapine gained more weight than males (4 kg and 6.98% of baseline weight in females versus 3.92 kg and 5.26% of baseline weight in males after one month) (Table-3). The picture was similar in Risperidone-treated group, where females gained 2.75 kg and 4.17% of baseline weight, whereas males gained 1.91 kg and 2.04% of baseline weight after one month of therapy (Table-4). Such variations between both genders, although were not significant, might be due to several factors, including predisposition for gaining weight, baseline weights of the patients, the dose of the antipsychotics, other demographic variables, co-morbid medical conditions, and even the underlying diagnoses, which call for further studies in future addressing such a concern.

CONCLUSIONS:

Both second generation antipsychotics, Olanzapine and Risperidone, are associated with weight gain. However, Olanzapine appears to have a greater potential in inducing weight gain. Both genders affected nearly equally, though females were victims of more amount of weight gain.

Limitations: the main limitation of the present study was the sample size differences of both group (60 Olanzapine-treated patients versus 20 Risperidone-treated patients). This limitation has been emerged because of more than one reason; including that the trend in Erbil city for the Antipsychotic prescriptions by psychiatrists is in favour of Olanzapine rather than Risperidone, which call for further studies for the reason behind such a trend. Furthermore, the study was retrospective one, and the

author put certain inclusion criteria that fit only these 80 patients who were treated with these two Antipsychotics. Another limitation of the study is that the author only considered the weight change, However it would be more valuable if Body Mass Indexes were considered. This limitation merged out due to lack of data of patients lengths in the patients files. This study calls for further, probably prospective, studies stressing on body mass indexes as well as other metabolic changes amongst those who receive Antipsychotics.

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