Effect of Antidepressants Medications in Glycemic State of Depression Disorders Patients

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ABSTRACT

As a result of elevation, depression disorders are prevalent globally; different medication protocols are used for patient therapy. The present study suggested studying the effect of antidepressant medications in a glycemic state of depression disorder patients, and glycemic biomarkers included fasting blood glucose (FBG), Glycated hemoglobin 1c (HbA1c), Insulin level (In), insulin resistance (IR), and insulin sensitivity (IS) were detected, the results show a significant elevation in HbA1c in the patient group than control (p 0.005) and BMI that decreased in patients than control (p 0.041). Other parameters show non-significant slight variations between groups, four types of antidepressants drugs in the present study included clomipramine, Tryptizol, Zyprexa, and Fluxetine. The effect of Antidepressant drugs on some glycemic parameters shows non-significant variation in all parameters, both Zyprexa and Fluxetin causes an elevation in FBG and HbA1c, also fluoxetine causes an elevation in insulin, IR and IS, from present finding can be concluded that fluoxetine causes alteration in glycemic parameters than other drugs and the antidepressants may be contributed in DM incidence.

Keywords: Antidepressants medications, Depression disorders patients, Glycemic state.

INTRODUCTION

The depression disorders recorded in high prevalence in Iraq in the last years, different factors that contributed to disease incidence included genetic predisposition, environmental, and lifestyle factors.[1] The depression disorder infected different age categories in Iraq. Elderly people were more than other age categories sufferer from Depression Disorders (DD).[2] Although being low health awareness about mental health in Iraq, patients have attended a Psychiatric clinic for medications in the last years.

The mental disorder medication includes psychotherapy and brain stimulation therapies. In addition to antidepressant drugs like Clomipramine drug, it is one of the tricyclic antidepressant members and found under the scientific name Anafranil.[3] Tryptizol is known as amitriptyline, tricyclic antidepressant family members used in major depressive disorder treatment and different pain syndromes from neuropathic pain in fibromyalgia to migraine and tension headaches.[4,5] Zyprexa is the trade name of Olanzapine, It is an atypical antipsychotic discovered in 1971 and in 1996 has been approved for medical use in the United States (US).[6,7]

Fluoxetine is an antidepressant of selective serotonin reuptake inhibitor class under brand name brand names Prozac and Sarafem.[8] All these drugs used in DD medication in the present study and their effect on the glycemic state have been studied for several drugs, the present study goals to estimate the side effect of these drugs on some glycemic biomarkers included FBG, HbA1c, Insulin, IS, and IR in depression disorder patients.

METHODOLOGY

Study Sitting and Subjects

Case-control study was conducted to study the effect of some Antidepressant drugs in the glycemic state in depression disorder patients, 18 male patients' attendance to a psychiatric clinic in Najaf province with different durations were enrolled in present study In addition to 25 healthy individuals as a control group that did not take any medications.

Exclusion Criteria

The criteria excluded from the present study were smokers, cancer, and diabetes mellitus.

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Sample Collection

The patients were diagnosed with depression disorders by a specialist Physician Dr. Arafat Al-Dujaily. Data, and blood samples were collected according to ethical approval of the environment and ministry of health in Iraq and approval from all individuals who contributed to this study, sera were isolated and stored in -20ºC until it's used.

Medications and Glycemic State

Patients were medicated by 4 types of therapeutic doses, including clomipramine, tryptizol, Zyprexa, and fluxetin. The glycemic state includes FBG, HbA1c, Insulin level, insulin resistance, and insulin sensitivity, were detected using routine lab works included ELIZA, spectrophotometric, and calculation equation for IR and IS.

Data Analysis

Data were represented as mean ± SE, Duncan test used in comparative analysis, and independent t-test used to compare patients and control groups at p< 0.05.
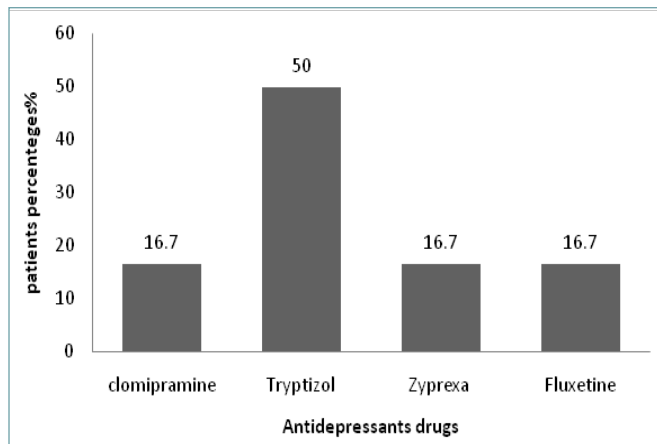

Figure 1: The percentages of DD patients according to Antidepressants drugs types

RESULTS

The present output that deals with the effect of Antidepressant drugs with some glycemic parameters shows a significant elevation in HbA1c in the patient group than the control (p 0.005) and BMI that decreased in patients than control (p 0.041). Other parameters show non-significant slight variations between groups (Table 1).

Four types of antidepressant drugs used by patients in the present study included clomipramine, Tryptizol, Zyprexa, and Fluxetine as therapeutic doses, belong to the percentage of used these drugs among patients 16.7% for clomipramine, Zyprexa, and Fluxetin and 50% for Tryptizol (Figure 1).

The effect of Antidepressant drugs on some glycemic parameters was investigated here. Results show non-significant variation in all parameters, although several differences were observed; both Zyprexa and Fluxetin cause elevation in FBG and HbA1c, and Fluxetin causes elevation in insulin, IR, and IS (Table 2).

DISCUSSION

As a result of a wide range of Antidepressant drugs usage in last years and after the panic of COVID-19 pandemic, some side effects of these drugs are still under investigation, the present study deals with some drugs included clomipramine Tryptizol, Zyprexa, and Fluxetine that have been used for depression medication. Tryptizol has more use than other drugs because it may help improve mood and feelings of well-being, relieve anxiety and tension, help you sleep better, and increase your energy level. This medication belongs to a class of medications called tricyclic antidepressants.[9] The effect of these drugs on glycemic state was non-significant in all parameters, slightly changes observed in the fluoxetine that cusses elevated in the insulin level, Biagetti and Corcoy found insulin requirements was reduced through the fluoxetine treatment period while HbA1c was stable,[10] others found that it induced hypoglycemia and pseudo hypoglycemia.[11,12]

Table 1: Age, BMI and glycemic parameters in patients and control groups.

Subjects	Age	BMI	FBG	HbA1c	In	IR	IS
Patients	39.44 ± 3.43	24.87 ± 0.94	90.16 ± 3.96	5.47 ± 0.07	2.50 ± 0.25	0.56 ± .073	0.43 ± .009
Control	33.88 ± 2.43	27.41 ± 0.75	96.52 ± 2.65	5.15 ± 0.07	2.48 ± 0.20	0.59 ± 0.05	0.42 ± 0.009
sig	0.181	0.041	0.174	0.005	0.961	0.799	0.684

Mean ± SE, Independent t test, p<0.05

Table 2: Effect of Antidepressants drugs on age, BMI and glycemic parameters in patients groups.

Drugs types	Age	BMI	FBG	HbA1c	In	IR	IS
clomipramine	43.00 ± 10.00	23.66 ± 1.650	86.00 ± 11.0	5.40 ± 0.100	2.11 ± 0.35	0.44 ± 0.077	0.44 ± 0.017
Tryptizol	35.22 ± 4.19	25.11 ± 1.30	89.77 ± 5.12	5.52 ± 0.097	2.45 ± 0.38122	0.55 ± 0.10810	0.43 ± 0.013
Zyprexa	42.66 ± 6.69	25.06 ± 0.69	98.00 ± 11.50	5.50 ± 0.200	2.21 ± 0.310	0.55 ± 0.129	0.43 ± 0.023
Fluxetin	45.33 ± 13.48	25.16 ± 4.65	87.66 ± 13.86	5.40 ± 0.34	3.32 ± 0.949	0.75 ± 0.295	0.42 ± 0.034
Control	33.88 ± 2.43	27.41 ± 0.75	96.52 ± 2.65	5.15 ± 0.072	2.48 ± 0.20	0.59 ± 0.053	0.42 ± 0.009
Sig	0.466	0.359	0.575	0.087	0.659	0.769	0.946

Zyprexa causes increased glucose level in the present study that deal with other study conducted by Goldstein *et al.*, and Seaberg *et al.*[13,14] The side effect of Antidepressants may represent diabetes mellitus type 2 and was inversely correlated with Antidepressants treatment.[15] The WHO's Adverse Drug Reaction Database showed increased risks of hyperglycemia and hypoglycemia associated with the use of Antidepressants drugs and significantly increased risk of hyperglycemia with Antidepressants drug use for >1 year.[16] Miidera *et al.* proved that long-term antidepressant use increased the risk of type 2 diabetes onset in a time- and dose-dependent manner.[17] Glucose tolerance improved when antidepressants were discontinued, or the dose was reduced after diabetes onset. The present study concluded that Fluxetin causes alteration in glycemic parameters than others drugs antidepressants might be contributed in the DM incidence.

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