

# Reduction of Serum Lipid Profile by Escitalopram in Depressive Patients: A Cardio Protective Aspect of SSRI Use



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## Abstract

**Background:** Depression is disturbance of mood, speech and thoughts interfering with the individual's social life and negatively affecting the family and thus the whole society. Suicide is the most horrible complication ending the life of the patient. Escitalopram belongs to the SSRIs, the most commonly used group of antidepressants worldwide.

**Objective:** To explore the effects of Escitalopram treatment on lipid profile in patients with depression.

**Methodology:** This experimental study of 6 months duration was conducted in Sir C.J Institute of Psychiatry Hyderabad and Isra Research Laboratory from July 2016 to December 2016. 72 diagnosed patients of depression were selected through non probability purposive sampling. After ethical approval and informed consent blood sample were collected under a septic measures. Samples were analyzed for total cholesterol, HDL, LDL and TAGs before intervention. 8 patients were dropped out from study as they lost follow up after 1 month. Same test were repeated in 64 patients who completed the study while after 6 weeks. Student's t-test was used as statistical technique data was analyzed on SPSS version 21.

**Results:** There was significant reduction in total cholesterol, LDL and TGs when compared with the pretreatment values P-values 0.01, 0.01 and 0.004 respectively. But there was no significant difference in HDL levels before and after treatment P-value 0.43.

**Conclusion:** Treatment with Escitalopram is associated with significant reduction in lipid profile.

**Keywords:** Escitalopram; Low density lipoprotein; High density lipoprotein; Triglycerides

## Introduction

Depression is a very common and ancient mental disorder prevalent all over the world since centuries affecting all age groups of both male and female genders. It is the 4th most serious public health problem worldwide with about 350 million people being affected and expected to be the most common mental disorder by year 2020 [1]. Depression has a wide range of symptoms that include low mood, negative thoughts, pessimism, guilt, and ugliness, indecisiveness, lack of interest and motivation, decreased sexual desire, appetite and sleep [2]. Depressive patients end their lives through suicide as a Complication of the disease. Suicide rates vary from country to country with Hungary on top where the rate is 58/100, 000 followed by, USA 20/100000 and Spain9/100000 every year. Prevalence of depression has long been studied in different populations that were found as ranging from 5% in general population and 10%-20% in chronic sick patients [3]. It is 3%-8.7% prevalent in children and 25% in pregnant women [4].

Students show a prevalence of 53.43% in Pakistan while 26.2% in Turkey [5]. Depression is also a risk factor for atherosclerosis in addition to smoking, physical inactivity, obesity and dyslipidemia [6]. The ideal treatment plan for depression consists of pharmacotherapy, psychological and educational interventions [7]. There are many pharmacological treatment options for depression like Tricyclic antidepressants (TCAs), mono amine oxidase inhibitors (MAOIs), Selective serotonin norepinephrine inhibitors (SNRIs), selective serotonin reuptake inhibitors (SSRIs) and atypical antidepressants [8]. SSRIs are most popular as they are safe, more tolerable, cheaper and due to their spectrum of indication other than depression [9]. It is also used to treat the premature ejaculation [10]. Escitalopram is derived from Citalopram with a bioavailability of 80% and half-life of 27-32 hours makes it once daily dosage of 10-20mg/day [9]. It is recommended to check total cholesterol, LDL-C, HDL-C and triglycerides in patients which are at risk of atherosclerosis

[11]. Few previous researches pointed out depression to be associated with disturbed lipid profile and such patients are more violent and prone to suicide [12]. Vaan Reed Dortland et al. [13] from Netherland also reported abnormal lipid pattern in depression. High levels of total cholesterol, LDL-cholesterol as well triglycerides were observed by Liang Y et al. [14] in depressive patients. As the duration of therapy is longer in depressive patients there is need of studies to observe effects of escitalopram on lipid profile that are not studied well in human so far. This additional information may help the depressed patients with comorbid conditions like ischemic heart diseases and dyslipidemia.

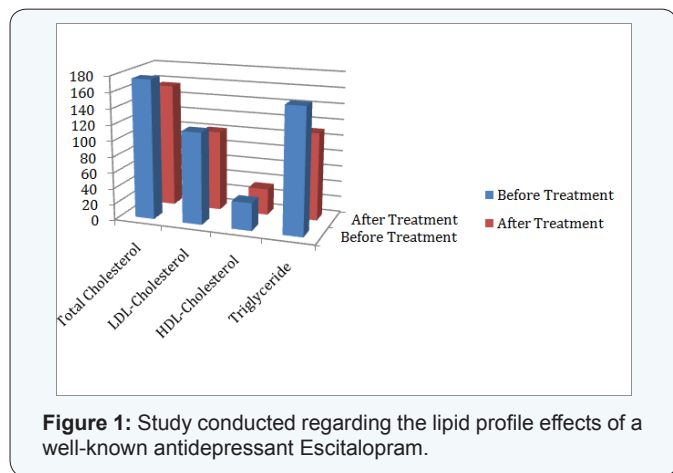
### Methodology

Depressive patients were selected from Sir Cowasjee Institute of Psychiatry Hyderabad Sindh, Pakistan after informed written consent. The study project was approved from the ethical review committee of the Isra University. Fasting blood samples were taken from the antecubital vein under aseptic measures. Samples were brought to Isra university hospital laboratory for biochemical analysis. Lipid studies were done on Hitachi automatic analyzer after obtaining serum through the centrifugation of whole blood at 3000 round per minutes.

### Statistical Analysis

Data analysis was accomplished using SPSS (Statistical Package for Social Sciences) version 21. Mean and standard deviation were calculated for the numerical variables. Paired sample t-test was used to compare the means of the pre and post treatment value of TC, LDL, HDL and TGs.

### Result (Figure 1)(Table 1)



**Table 1:** Comparison between pre and post treatment lipid profile (n=64).

Parameters	Pre Treatment	Post Treatment	P-Value
Total Cholesterol (mg/dl)	175.17±1.50	156±35.90	0.01
HDL-Cholesterol (mg/dl)	34.77±10.17	33.25±11.84	0.43
LDL-Cholesterol (mg/dl)	115.31±33.40	101.28±26.80	0.01
Triglyceride (mg/dl)	156.69±0.25	110.61±53.68	0.004

### Discussion

Serotonin reuptake inhibitors have been used for very long period and they are associated with excellent results regarding reduction in the depressive symptoms in depressive patients. They are drugs of interest. Depression is a very disturbing mental health disorder of the world in all age groups of both male and female sex disturbing lives and ending into suicide of 1million people every year [15]. Our community has a poor knowledge about depression including the health care providers [16]. Escitalopram is the first line choice SSRI, superior in efficacy and well tolerated by the patient 90. Its metabolic effects are of great interest as the drug is commonly used for longer periods. Our study is the first human study conducted in Pakistan regarding the lipid profile and glucose effects of a well-known antidepressant Escitalopram. However there are few studies available on the same parameters but they were limited and controversial due to comorbidities. Our study was purely based on depressive patients provided by the consultants Psychiatrists of the Sir Cowasjee Jahangir Institute of Psychiatry Hyderabad Sindh, Pakistan.

#### Total cholesterol

Our 6 weeks study showed a reduction in serum total cholesterol that was in contrast to findings of Jana Radojkovic et al. [17] reporting no significant reduction in total cholesterol. This may be due to the fact that the study population was diabetic in his work. However our findings were consistent with AminaUnis et al. [18]. Who declared a significant decrease in total cholesterol after 6 weeks treatment with Escitalopram in an animal model. M Beyazyaz et al. [19] in his relatively longer duration study (16 weeks) also reported a reduction in serum total cholesterol following Escitalopram treatment that is in accordance with our results.

#### HDL-cholesterol

Our study reported a non-significant reduction in HDL levels which is in contrast to results of study by Amin Unis et al. [18] which shows a significant increase in HDL levels. Our results are in accordance with the results of M Beyazyaz et al. [19] who also reported no significant effects of Escitalopram on serum HDL concentration. As we know the HDL cholesterol is beneficial cholesterol so it should not be reduced but should be increased studies proved so far that Escitalopram either increases the HDL levels or if reduces but not to significant levels.

#### LDL-cholesterol

Low density cholesterol was reduced in our study which is in accordance with the study by Amina Unis et al. [18] which also showed a significant reduction in LDL cholesterol. Similarly our results are also consistent with the findings of M Beyazyaz et al. [19] who also reported a significant in LDL cholesterol.

#### Triglycerides

There is highly significant reduction in triglyceride levels in our study which in accordance with the results of Jana

Radojkovic et al. [17] who also concluded a significant decrease in triglyceride levels. Our results are also consistent with the results of Amina Unis et al. [18] which showed a significant reduction in serum triglyceride level after treatment with Escitalopram. Results of the study by M Beyazyaz et al. [19] showed an increase in the triglyceride levels which is in contrast to our findings. All studies discussed so far lack a common feature that none of them explained the possible mechanism of reducing the lipid profile. This remained a weakness of our study as well and a gape for the future researchers to work on. Escitalopram may have some inhibitory effect on lipolipase an enzyme responsible for breakdown of fats into fatty acids and triglycerides. It may also possess some activity at LDL receptors increasing its uptake all needs further exploration.

## Conclusion

Parameters of lipid profile (TC, LDL, TGs) are significantly reduced in depressive patients on Escitalopram treatment however HDL-cholesterol remained unchanged (non-significant).

## Recommendations

- a) The use of Escitalopram is recommended for depressive patients with dyslipidemia as well as cardiac patients.
- b) It is recommended to explore the exact mechanism behind the lipid lowering effects of Escitalopram.

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