



Efficacy of Escitalopram (SSRI) for Better Glycemic Control in the Diabetic Depressive Patients

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Diabetes Mellitus, Depression, Escitalopram

Abstract

Background: Diabetes Mellitus is one of the most common disease in the world. Depression is most common among Diabetic patients, that causes morbidity and mortality. For prevention, we need to anti depressive agents with continued treatment for better compliance. So, it is important evaluate the efficacy of Escitalopram (SSRI) for better glycemic control in Diabetic Depressive patients.

Objective: To assess the effect of Escitalopram (SSRI) on glycemic control in Type-2 Diabetic Depressive patients.

Methods and Materials: A prospective observational study was done in Sir Salimullah Medical College and Mitford Hospital and BIRDEM General Hospital from January 2018 to December 2018. A total number of 35 diabetic and newly diagnosed depressive patients were taken and given tab. Escitalopram with continued diabetic treatment. Here, pre and post baseline investigations (FBG, Post prandial blood glucose and HbA1c levels) measured on day 1, follow up at 6 weeks, 12 weeks and then compared.

Results: Patients treated with Escitalopram, pretreatment shows mean base line FBG 10.41 ± 1.84 mmol/L which was reduced to 8.56 ± 1.55 mmol/L at 6 weeks and 7.51 ± 1.26 mmol/L on 12 weeks. Similarly baseline mean 2HABF (post prandial) blood glucose 14.16 ± 2.48 mmol/L which was reduced to $12.41.01 \pm 2.34$ mmol/L on 6 weeks and 10.96 ± 1.75 mmol/L in 12 weeks. Mean baseline HbA1c $8.88 \pm 0.67\%$ after in 12 weeks it was reduced to $7.82 \pm 0.98\%$. Here significant changed in blood glucose and HbA1c levels compared to pretreatment with Escitalopram (Treatment glucose and HbA1c levels compared to pretreatment with Escitalopram & only anti diabetic drugs).

Conclusion: Escitalopram has better efficacy on glycemic control in Diabetic Depressive patients than patients treated with antidiabetic alone.

Introduction

Diabetes Mellitus (DM) is one of the most common chronic medical disease in everywhere. One of the consistent findings among various studies on Diabetes has been the high prevalence of Depression with or without anxiety.¹ This

prevalence of major Depression is three times higher among Diabetic patients than that seen in general population.² The association between depression and diabetes was first described in the seventeenth century by Thomas Willis, an English Physician and Anatomist, who stated, 'Diabetes is

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caused by sadness or long sorrow'. Indeed, in modern times, a systematic review found that depression earlier in life increased the risk of development of type 2 diabetes by up to 37%.³ The frequency of co-morbid Depression in patients with Diabetes range from 10% to 40%.⁴

The presence of comorbid depressive symptoms may have a negative impact on management of Diabetes Mellitus.² Major Depression is associated with increased medical utilization and costs, higher symptom burden, increased functional impairment including poor selfcare, noncompliance to treatment and other decrements in quality of life, and increased rates of mortality.¹

The role of stress is one of the most common aetiological factors for both Depression and Diabetes has been well established. Stress may lead to deterioration of glycemic control via its effects on the neuroendocrine system, psychological reaction to stress leads to the activation of hypothalamo-pituitary adrenal (HPA) axis which causes endocrine abnormalities such as high cortisol and low sex steroid levels, that antagonize the action of insulin. It may impact more indirectly via changes in health behaviours, such as-regimen adherence, smoking or drinking practices. At the same time, an increase in visceral adiposite is seen, which plays an important role in Diabetes by contributing to insulin resistance.¹

Thus Depressive patients have been shown insulin resistance with decreased glucose tolerance.¹

In studies with non-Diabetic Depressed patients several investigations using the insulin tolerance test have been demonstrated a blunted hypoglycemic response. This finding has been interpreted as indicating a functional state of insulin resistance in Depression.⁵ On the other hand if serotonergic function increased by antidepressants, then results in increased sensitivity to insulin and reduces plasma glucose levels.¹

There are many antidepressants for depression with diabetes mellitus, such as-Tricyclic antidepressants (TCA), selective serotonin reuptake inhibitors (SSRIS), selective serotonin noradrenergic inhibitors (SNRIS). Although Tricyclic antidepressants and Mono Amino Oxidase Inhibitors appear to be effective therapy for depression in patients with Diabetes, but there is

evidence these agents destabilize glycemic control in some diabetic patients.⁴

In contrast selective serotonin reuptake inhibitors (SSRIs) may facilitate glycemic control in some patients with co-morbid Diabetes and Depression.

The favorable profiles of SSRIs make them preferred pharmacologic interventions for patients with Depression and Diabetes. SSRI-Escitalopram may having better efficacy and safety for the depression and glycemic control of the patients.⁴

Considering the ever-increasing population of Diabetes in our country and the significant causal relationship of Depression and glycemic control which is established by current literature to do this study.

Methods

An Observational prospective study conducted on 35 diabetic with recent diagnosis of depressive patients who are receiving Escitalopram in outpatient Psychiatry department of Sir Salimullah Medical College and BIRDEM, General Hospital, from January 2018 to December 2018.

Inclusion criteria:

- Patients more than 40 years of age.
- Patients with Type 2 Diabetes Mellitus (more than 2-3 years) and newly diagnosed Depression, compliance on treatment and on regular follow up.
- Patients with spikes or increase in the blood glucose levels from previously maintained baseline within last three months.

Exclusion criteria:

- Patients having history of prior psychiatric illness (except-Depression with or without anxiety) and/or prior treatment with psychiatric medicine.
- Patients with Type 1 Diabetes Mellitus.
- Patients with chronic medical (Chronic Liver and Kidney disease) or surgical illness.
- Patients who are currently using corticosteroids.

Method of collection of data: Data was collected by using a structured questionnaire containing all the variables of interest. Written consent was taken from the patients or his / her legal guardian

after proper counseling. Patients were selected according to inclusion & exclusion criteria. All collected questionnaire were checked very carefully to identify error in data. Data processing consisted of registration schedule editing computerization, preparation of dummy table, analyzing & matching of data. Statistical analysis was done by using statistical package of social service (SPSS) for windows version 22.

Results

The research work was conducted in the Department of Pharmacology and Therapeutics, Sir Salimullah Medical College using prospective observational study design. During the study period, a total of 55 patients were enrolled as study population, Out of them, 35 patients were included in the study.

The study subjects were given Tab. Escitalopram (SSRI) with continued Antidiabetic drugs treatment. Baseline investigations (Blood glucose levels and HbA1c level) were done. Follow up of blood glucose levels (Fasting and 2 hours after breakfast) at 6 weeks and 12 weeks again blood glucose levels and HbA1c levels were done and compared. Reduction of Blood glucose levels, HbA1c and side effects of Escitalopram were observed.

Table I shows all the 35 patients completed the study. Patient's age ranged between 40 to 68 years, with the mean age being 51.2 ± 6.3 years. Among the 35 patients 5(14.3%) males and 30(85.7%) are females. Most of the patient's monthly income-20000-30000 taka and it was 42.86%

Table-I

Baseline characteristics of the study patients (n=35)

| Baseline characteristics | Frequency (n) | Percentage (%) |
|--------------------------|--------------------|----------------|
| Age group (years) | | |
| 40 – 49 | 15 | 42.9 |
| 50 – 59 | 16 | 45.7 |
| ≥60 | 4 | 11.4 |
| Mean±SD (min – max) | 51.2±6.3 (40 - 64) | |
| Gender | | |
| Male | 5 | 14.3 |
| Female | 30 | 85.7 |
| Monthly income | | |
| ≤10000 | 3 | 8.57 |
| 10000 – 20000 | 5 | 14.29 |
| 20000 – 30000 | 15 | 42.86 |
| ≥30000 | 12 | 34.29 |

Table-II shows severity of Depression of the patients by HAM-D Score. Among the 35 patients, 9 (25.7%) are minor Depressive and 26 (74.3%) are Moderate to Severe Depressive.

Table-II

Severity of Depression by HAM-D score

| Grade of Depression | Frequency (n) | Percentage (%) |
|---------------------|---------------|----------------|
| Minor | 9 | 25.7 |
| Moderate to Severe | 26 | 74.3 |

Table-III

Fasting blood glucose, 2HABF and HbA1c levels while taking Anti Diabetic drugs only and after 6 weeks & 12 weeks of taking Escitalopram with Anti Diabetic drug (n=35)

| | Anti-diabetic drugs only | 6 wks After | 12 wks After | p-value | |
|---------------|--------------------------|-----------------------|-----------------------|-----------------------|-------------------------|
| | | Starting Escitalopram | Starting Escitalopram | Pre-treatment vs 6wks | Pre-treatment vs 12 wks |
| FBG (mmol/L) | 10.4±1.8 | 8.6±1.6 | 7.5±1.3 | <0.001 | <0.001 |
| 2hABF(mmol/L) | 14.2±2.5 | 12.4±2.3 | 10.9±1.8 | <0.001 | <0.001 |
| HbA1c (%) | 8.9±0.7 | 7.94±0.7 | 7.8±1.0 | <0.001 | <0.001 |

Paired t test was done to measure the level of significance

Table-III shows mean base line FBG 10.41 ±1.84mmol/L which was reduced to 8.56±1.55 mmol/L on 6 weeks and 7.51±1.26mmol/L on 12 weeks. Baseline mean 2HABF 14.16±2.48mmol/L which was reduced to 12.41.01±2.34 mmol/L on 6 weeks and 10.96±1.75 mmol/L at 12 weeks, Mean baseline HbA1c 8.88±0.67% and at 12 weeks it was reduced to 7.82±0.98%. There was significant change in blood glucose levels and HbA1c level compared to pretreatment with Escitalopram (Treatment with only anti diabetic drugs). Paired t-test was done to measure the level of significance.

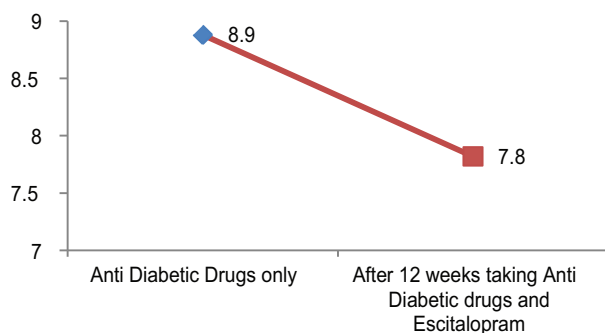


Fig.-1: Line diagram shows effect of FBS and 2HABF blood glucose levels at baseline and after 6 weeks and 12 weeks.

Figure 1 shows- mean base line FBS (Fasting Blood Sugar) 10.41 ±1.84mmol/L which was reduced to 8.56±1.55 mmol/L on 6 weeks and 7.51±1.26mmol/L on 12 weeks. Baseline 2HABF (2 hours after breakfast) 14.16±2.48mmol/L which was reduced to 12.41.01±2.34 mmol/L on 6 weeks and 10.96±1.75 mmol/L in 12 weeks. There was significant change in blood glucose levels compared to pretreatment with Escitalopram (Treatment with only anti diabetic drugs).

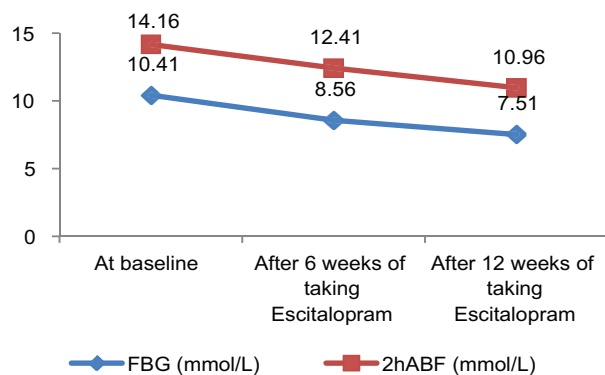


Fig.-2: Line diagram shows effect of HbA1c(%) levels at baseline and end of 12 weeks.

Figure 2 shows mean baseline HbA1c 8.88±0.67% and at 12 weeks it was reduced to 7.82±0.98% . There was significant change in HbA1c level compared to pretreatment with Escitalopram (Treatment with only anti diabetic drugs).

Discussion

The results from this study demonstrated that most of the patient’s age ranged between 40 to 68 years, with the mean age being 51.2 ± 6.3 years.

Moreover, in age group distribution, maximum 45.7% patients were in the age group of 50-59 years. The tendency of Diabetes is more in this age group of the patients and this people are very much prone to developed Depression. Similar another study found mean age of patients with comorbid diabetes and depression was 50.8 years with 60.1% females.⁴

In this study, females were more than males. Females were 85.7%. On the other hand, male patients were 14.3%. Depression is commoner in females and those with a duration of diabetes>3 years had a three fold higher risk of depression.⁵ So this study has similar gender distribution with others studies done by Gehlawat et al.⁴

In this study, there among the 35 patients 25.7% are minor Depressive and 74.3% are Moderate to Severe Depressive and 34.3% there Depression with Anxiety and on the other hand, 65.7% were Depression without anxiety.

The mean fasting and post prandial (2HABF) plasma glucose level decreased significantly from baseline level at 6 and 12 weeks respectively. The mean decrease at 12 weeks, fasting blood glucose was 7.51±1.26 mmol/L and post prandial (2HABF) blood glucose was 10.96±1.75 mmol/L respectively. Similar study was conducted by Gehlawat et.al.⁴ and Dhavale et al.¹ that showed similar efficacy of this drug.

In this study, the change in HbA1c level was found to be significant reduced at 12 weeks with a mean decrease of 1.06±0.31%. Here, mean baseline HbA1c 8.88±0.67% and in 12 weeks it was reduced to 7.82±0.98%. Similar study was conducted by Gehlawat et al.⁴ which also showed reduction of the level of HbA1c, which supports findings of present study.

Therefore, it can be said from above results of present study and data from previous study favours the efficacy of Escitalopram has better efficacy for glycemic to improve glycemic control in Diabetic Depressive patients.

Conclusion

It is evident from the study that Escitalopram (SSRI) has better efficacy on improving glycemic control for the Diabetic Depressive patients.

Limitations of the study

- The study was concluded with a small size, so findings may not be generalized in large scale.
- The time of period of the study was limited. So it was difficult to obtain necessary data from the patient through follow up.
- The study was done in only two tertiary care hospitals of Bangladesh. So variation in the treatment in other hospitals could not be evaluated

Recommendation

It is recommended that, further study should be done with a greater number of samples, including the effects of glycemic control, adverse effect of drugs with long study periods to get more authentic result.

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