Salubris Open | IJADD

Case Report

Significant Reduction of Elevated Triglycerides and Blood Glucose in Prediabetes with Saroglitazar: A Case Report

Ritesh Agrawala

Consultant Endocrinologist, AMRI Hospital, Bhubaneswar, Odisha, India.

Corresponding author: Ritesh Agrawala, Consultant Endocrinologist, AMRI Hospital, Bhubaneswar, Odisha, India.
Email: drriteshagr@gmail.com

Article information

Received date: 7/02/2020; **Accepted date:** 9/03/2020; **Published date:** 16/03/2020

Abstract

The natural history of development of type 2 diabetes involves genetically predisposed individuals progressing from normal glucose tolerance to impaired glucose tolerance (prediabetes) and finally, type 2 diabetes. Individuals with prediabetes often have dyslipidaemia and are at a higher risk for developing cardiovascular disease. Previous studies have shown that conversion of impaired glucose tolerance to type 2 diabetes can be reduced through lifestyle modification as well as with the use of certain antidiabetic medications. In view of the risk of conversion to type 2 diabetes and its complications in prediabetes, the present case report illustrates the efficacy of saroglitazar in reducing hypertriglyceridaemia and reducing elevated blood glucose in prediabetes.

Keywords: Dyslipidaemia, cardiovascular disease, prediabetes, glucose, triglyceride

Introduction

Prevalence of diabetes and pre-diabetes in India in 2011 was 62.4 and 77.2 million, respectively.[1] Prediabetes is a condition where fasting, post prandial blood glucose or HbA1c is more than the considered normal levels, but below the level classified as diabetes mellitus. Lipid disorders occur frequently in type 2 diabetes mellitus (T2DM) patients and are responsible for macrovascular complications and contribute to the excess risk of cardiovascular disease (CVD).[1] Individuals with prediabetes are at risk of developing diabetes as well as cardiovascular disease and aggressive management of cardiovascular risk factors such as hypertension and dyslipidaemia should be ensured. Proper management of prediabetes with lifestyle modification and necessary medications could prevent the development of diabetes and complications.

Case

A 38-year-old male on his regular check-up was diagnosed to have prediabetes and hypertriglyceridaemia. He did not have any significant medical history or family history for the same. No history of alcohol or smoking. On examination, his weight and weight were measured at baseline and during subsequent follow-up (**Table 1**). The blood reports showed impaired fasting and post prandial plasma glucose and abnormal HbA1c confirming the diagnosis of prediabetes (123 mg/dL, 189 mg/dL and 6.4%, respectively). His lipid parameters were also abnormal with total cholesterol (TC), low density lipoprotein (LDL), triglyceride (TG) and high-density lipoprotein (HDL) were 220 mg/dL, 124 mg/dL, 542 mg/dL and 34 mg/dL, respectively. He was put on saroglitazar (off-label) 4 mg daily and on lifestyle modification (LSM) and was asked to re-visit the clinic after three months. Follow-up after 3 months and 6 months showed good control of lipid and blood glucose parameter along with reduction of HbA1c (**Table 1**) without any adverse effect like unusual muscle pain, tenderness, flu-like symptoms, nausea, vomiting, weight gain, oedema, etc.

Table 1. Anthropometric and biochemical parameters. Abbreviations: BMI- Body mass index; FBS- Fasting blood sugar; PPBS- Postprandial glucose test; HbA1c- Haemoglobin A1c; LDL- Low-density lipoprotein; HDL- High-density lipoproteins; SGOT- Serum glutamic oxaloacetic transaminase; SGPT- Serum glutamic pyruvic transaminase.

Parameter	Baseline	3 month	6 month
Weight (kg)	70	68	67
Height (cm)	164	164	164
BMI (kg/m^2)	26.11	25.3	25
FBS	123	110	98
PPBS	189	158	142
HbA1c	6.4	6.3	5.9
Serum cholesterol	220	180	158
Serum triglyceride	542	230	149
LDL	124	110	102
HDL	34	38	42
SGOT	26	24	24
SGPT	26	26	22

Discussion

Peroxisome proliferator-activated receptor-alpha (PPAR-alpha) is present in liver, heart and skeletal muscle. It helps in fatty acid oxidation and ketone body synthesis. PPAR-gamma is present in adipose tissue and lower intestine. It helps in differentiation of preadipocytes into adipocytes and stimulates triglyceride storage.[2] Insulin resistance and a relative insulin secretory defect is associated with T2DM, dyslipidaemia and metabolic syndrome. In diabetic dyslipidaemia, achieving target for both glycaemic and lipid levels is challenging. Saroglitazar is the only approved dual PPAR $\alpha + \gamma$ agonist in India for the treatment of T2DM with or without dyslipidaemia. Due to its dual action, it has a reducing effect on elevated TG and a positive effect on insulin sensitivity. Randomized trials have shown that saroglitazar when added to statin leads to a significant decrease in TG (–46.7%) and non-HDL cholesterol (–32.5%) along with a significant decrease in HbA1c (–0.3%).[3] Saroglitazar effectively reduces triglyceride, blood glucose, non-high-density lipoprotein cholesterol (non-HDL-C) and small dense low-density lipoprotein sd-LDL particles in patients with diabetic dyslipidaemia.[4] Goyal *et al*. also found that saroglitazar with other drugs improve the glycaemic and lipid parameters.[5]

Our patient showed reductions in glycaemic parameters along with reduction in lipid abnormalities with saroglitazar.

We know of saroglitazar's role in hypertriglyceridaemia in diabetes, but in this case, saroglitazar was used in prediabetes and good results were observed, both in term of blood glucose control and reduction of lipid parameters. So in the future, we can use it in these type of patients if further evidence is generated.

Conclusion

In our patient, the use of saroglitazar in prediabetes and dyslipidaemia brought about significant improvement in the glycaemic and lipid parameters without any adverse effects.

Declaration of conflicting interests

The author has no conflict of interest.

Funding

No funding was received for this study.

Informed consent

Written informed consent was obtained from the patient.

Reference

1. Anjana RM, Pradeepa R, Deepa M, Datta M, Sudha V, Unnikrishnan R. ICMR–INDIAB Collaborative Study Group. Prevalence of diabetes and prediabetes (impaired fasting glucose and/or impaired glucose tolerance) in urban and rural India: phase I results of the Indian Council of Medical Research-INdiaDIABetes (ICMR- INDIAB) study. Diabetologia. 2011; 54:3022-027.
2. Chatterjee S, Majumder A, Ray S. Observational Study of Effects of Saroglitazar on Glycaemic and Lipid Parameters on Indian Patients with Type 2 Diabetes. Sci Rep. 2015; 5:7706.
3. Roy S, Ghosh A. Significant Reduction of Elevated Triglycerides and Liver Fibrosis in Diabetic Dyslipidemia with Saroglitazar: A Case Report. Cureus. 2019; 11(12):e6361.
4. Kaul U, Arambam P, Kachru R, Bhatia V, Diana Y, Shah M, et al. A Prospective, Multicentre, Single Arm Clinical Study toEvaluate the Effect of Saroglitazar on Non High-Density Lipoprotein Cholesterol in Patients with Diabetic Dyslipidemia Inadequately Controlled with Diet, Exercise, and Statin-The GLIDDER Study. J Diabetes Metab. 10:819.
5. Goyal J, Bhandari S, Kaushik SK, Goyal B, Chandalia S, Attri R. A study to evaluate the effect of saroglitazar in type 2 diabetes. Int J Contemp Med Res. 2019; 6(9):11-I4.