European Journal of Molecular & Clinical Medicine

ISSN 2515-8260 Volume 09, Issue 01, 2022

ORIGINAL RESEARCH

Efficacy of Saroglitazarin patients with diabetic dyslipidemia

Surendra Kumar Ghintala[1], Pradeep Kumar[2], Ajeetkumar Gadhwal[3], Ratan Kumar Agarwal[4]

[1]Assistant Professor, Department of General Medicine, RUHS College of Medical Sciences, Jaipur, Rajasthan, India;
[2]Senior Medical Officer, Department of General Medicine, Govt. DB District Hospital, Churu, Rajasthan, India;
[3]Assistant Professor, Department of General Medicine, PDU Medical College, Churu, Rajasthan, India
[4]Medical Officer, Department of General Medicine, Govt. DB District Hospital, Churu, Rajasthan, India

Corresponding author
Dr.Surendra Kumar Ghintala
Assistant Professor, Department of General Medicine, RUHS College of Medical Sciences, Jaipur, Rajasthan, India

***ABSTRACT*:**
Background:Type 2 diabetes mellitus (T2DM) is a complex metabolic disorder characterized by persistent hyperglycaemia due to relative insulin deficiency, insulin resistance. This study assessed efficacy of Saroglitazar in patients with diabetic dyslipidemia
Materials & Methods:120 patients with type 2 diabetes mellitus of both genders were assessed for serum fasting plasma glucose, post prandial glucose, glycated hemoglobin (HbA1c), blood urea, serum creatinine, S.G.O.T, S.G.P.T and lipid profile. Patients were treated with Saroglitazar 4 mg once daily and the follow-up data were available for 12 months.
Results: Out of 120 patients, males were 80 and females were 40. The mean triglyceride level was 610.4, 208.4 and 224.4, total cholesterol was 312.2, 244.7 and 172.1, non- HDL-C was 274.8, 199.6 and 126.3, LDL- C was 165.6, 116.8 and 104.17, HDL- C was 41.4, 42.1 and 42.5, HbA1C was 8.02, 7.8 and 7.1, FPG was 156.2, 130.5 and 120.4, PPG was 234.6, 172.1 and 160.5, SGOT was 46.6, 42.3 and 40.3, SGPT was 34.2, 38.4 and 37.4, S. Creatinine was 0.7 and CPK was 74.3, 71.6 and 68.3 at baseline, 12 wees and 52 weeks respectively. The difference was significant (P<0.05).
Conclusion: Saroglitazar is a very effective therapeutic option in diabetic dyslipidemia with very high triglycerides level.
Key words: cholesterol, Diabetes, Saroglitazar

Introduction

Type 2 diabetes mellitus (T2DM) is a complex metabolic disorder characterized by persistent hyperglycaemia due to relative insulin deficiency, insulin resistance, dyslipidemia and vascular inflammation that are associated with an increase in the risk for cardiovascular diseases (CVDs).[1] An estimated 463.0 million adults aged 20–79 years have diabetes across the world.[2]

Cardiovascular disease (CVD) is the major cause of morbidity and mortality in individuals with type 2 diabetes mellitus and responsible for 75% of deaths among type 2 diabetes patients.[3] There is also 2- to 4-fold increase in cardiovascular events (coronary heart disease, stroke and peripheral vascular disease) when compared with nondiabetic patients.[4]
Saroglitazar is the novel molecule approved in India for the management of DD. It is the first dual peroxisome proliferator activated receptor (PPAR)-a/g agonist to have successfully completed its clinical research and to be approved for clinical use anywhere in the world.[5] In previous studies, saroglitazar has shown significant benefit in terms of improvement in lipid and glycemic parameters with good safety profile. There has been a 46.7% decrease in TG, 32.5% decrease in non-HDL-C, 0.3% absolute reduction in glycosylated hemoglobin (HbA1c) with saroglitazar 4 mg in Indian DD patient.[6] This study assessed efficacy of Saroglitazar in patients with diabetic dyslipidemia .

Materials & Methods

The present study comprised of 120 patients with type 2 diabetes mellitus of both genders. All patients were informed regarding the study and their written consent was obtained.
Demographic data such as name, age, gender etc. was recorded. In all patients, parameters such as serum fasting plasma glucose, post prandial glucose, glycated hemoglobin (HbA1c), blood urea, serum creatinine, S.G.O.T, S.G.P.T and lipid profile were assessed. Patients were treated with Saroglitazar 4 mg once daily and the follow-up data were available for 12 months. Results were studied statistically. P value less than 0.05 was considered significant.

Results

Table I Distribution of patients

Total- 120		
Gender	**Males**	**Females**
Number	80	40

Table I, graph I shows that out of 120 patients, males were 80 and females were 40.

Graph IDistribution of patients

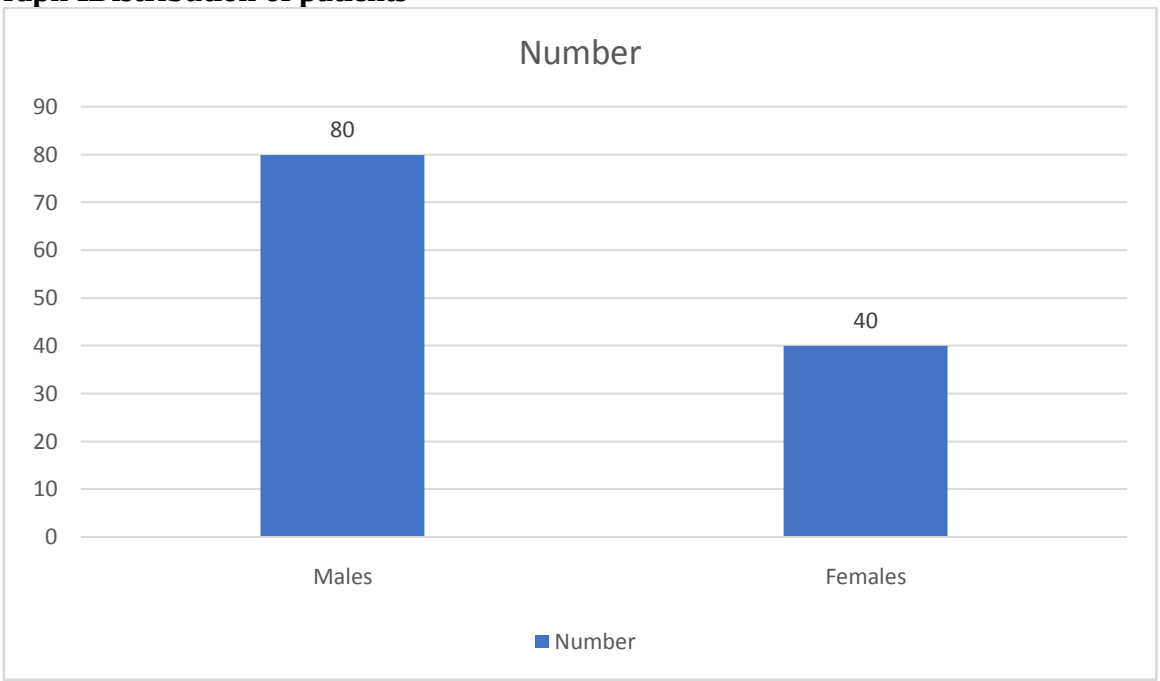
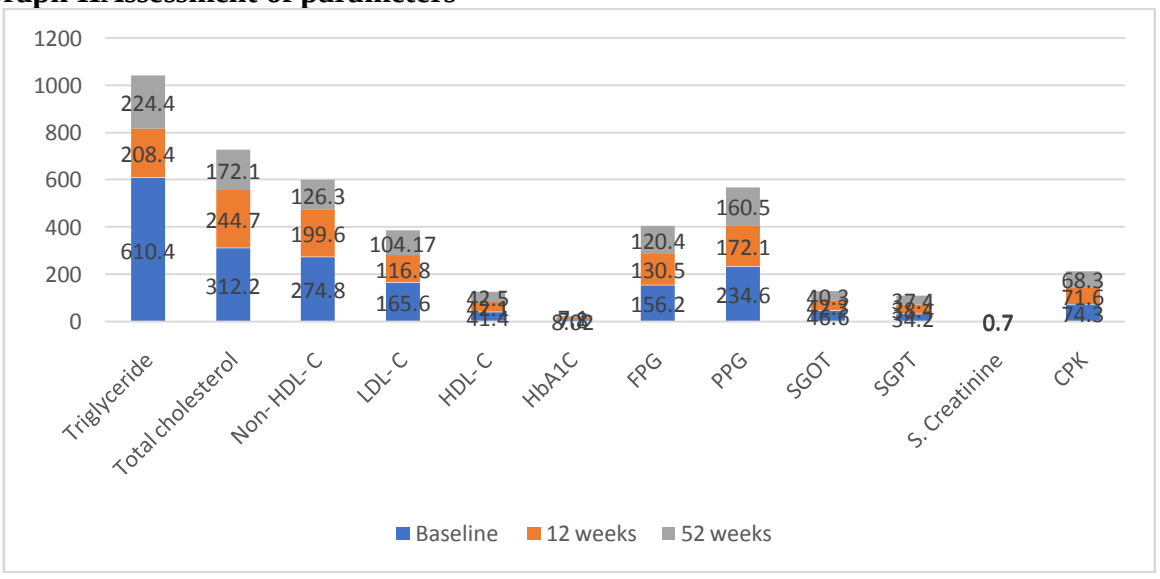


Table II Assessment of parameters

Parameters	Baseline	12 weeks	52 weeks	P value
Triglyceride	610.4	208.4	224.4	0.01
Total cholesterol	312.2	244.7	172.1	0.03
Non- HDL- C	274.8	199.6	126.3	0.05
LDL- C	165.6	116.8	104.17	0.04
HDL- C	41.4	42.1	42.5	0.02
HbA1C	8.02	7.8	7.1	0.01
FPG	156.2	130.5	120.4	0.02
PPG	234.6	172.1	160.5	0.04
SGOT	46.6	42.3	40.3	0.46
SGPT	34.2	38.4	37.4	0.31
S. Creatinine	0.7	0.7	0.7	0.54
CPK	74.3	71.6	68.3	0.17

Table II, graph II shows that mean triglyceride level was 610.4, 208.4 and 224.4, total cholesterol was 312.2, 244.7 and 172.1, non- HDL- C was 274.8, 199.6 and 126.3, LDL- C was 165.6, 116.8 and 104.17, HDL- C was 41.4, 42.1 and 42.5, HbA1C was 8.02, 7.8 and 7.1, FPG was 156.2, 130.5 and 120.4, PPG was 234.6, 172.1 and 160.5, SGOT was 46.6, 42.3 and 40.3, SGPT was 34.2, 38.4 and 37.4, S. Creatinine was 0.7 and CPK was 74.3, 71.6 and 68.3 at baseline, 12 wees and 52 weeks respectively. The difference was significant (P<0.05).

Graph IIAssessment of parameters



Discussion

Diabetes and diabetic dyslipidemia with high triglycerides (TGs) are commonly associated. Diabetic dyslipidemia (DD) is an important factor contributing to the increased risk of CVDs.[7] Studies have shown that three out of four diabetes patients globally have associated dyslipidemia.[8] DD, also known as atherogenic dyslipidemia, is the triad of high triglycerides (TG), higher proportion of small dense low density lipoprotein cholesterol (sd-LDL-C) and

low high density lipoprotein cholesterol (HDL-C).[9,10] This study assessed efficacy of Saroglitazar in patients with diabetic dyslipidemia.

In present study, out of 120 patients, males were 80 and females were 40. Krishnappa et al[11] assessed the efficacy and safety of saroglitazar (2 mg and 4 mg) as compared to pioglitazone 30 mg on glycemic control in patients with type 2 diabetes mellitus. Patients received once-daily doses of either saroglitazar or pioglitazone (1:1:1 allocation ratio) for a total of 24 weeks. Patients were continued in a double- blind extension period for an additional 32 weeks. Efficacy evaluations of glycemic parameters and other lipid parameters were conducted at week 12, 24 and 56 and compared to the baseline levels. A total of 1155 patients were enrolled in this study. The baseline characteristics were similar between the three treatment groups. The within group mean (±SD) change in HbA1c (%) from baseline of the saroglitazar (2 mg and 4 mg) and pioglitazone treatment groups at week 24 were: −1.38±1.99 for saroglitazar 2 mg; −1.47±1.92 for saroglitazar 4 mg and −1.41±1.86 for pioglitazone, respectively. Statistically significant reduction from baseline in HbA1c was observed in each treatment group at week 24 with p-value

We found that mean triglyceride level was 610.4, 208.4 and 224.4, total cholesterol was 312.2, 244.7 and 172.1, non- HDL- C was 274.8, 199.6 and 126.3, LDL- C was 165.6, 116.8 and 104.17, HDL- C was 41.4, 42.1 and 42.5, HbA1C was 8.02, 7.8 and 7.1, FPG was 156.2, 130.5 and 120.4, PPG was 234.6, 172.1 and 160.5, SGOT was 46.6, 42.3 and 40.3, SGPT was 34.2, 38.4 and 37.4, S. Creatinine was 0.7 and CPK was 74.3, 71.6 and 68.3 at baseline, 12 weeks and 52 weeks respectively. PPAR agonists have been reported to inhibit vascular smooth muscle cell proliferation, decrease the risk of thrombosis and suppression of atherosclerosis or restenosis. So, PPAR agonists have a potential to improve restoration of the cardiovascular system and its associated cardiovascular risk. Mori et al[12] observed the improvement of the cardiovascular system and its associated cardiovascular risk in a pre-clinical study. In this pre-clinical study, the effect of PPAR γ agonist (pioglitazone) was studied to evaluate the improvement of cardiac function. The authors investigated the combined administration of pioglitazone and adipose tissue-derived regenerative cells in a rat ischemic cardiomyopathy model. They observed stronger improvement of cardiac function and enhancement of adiponectin paracrine effects.

Shetty et al[13] evaluated the safety and efficacy of saroglitazar 4 mg once daily in clinical practice. Patients with type 2 diabetes (with on-going antidiabetic medication), age above 18 years, and triglycerides ≥200 mg/dL were included. A total 2804 patients with a mean duration of diabetes 6.29 years were included in this analysis. The baseline demographic profile was: mean age of 53 years, mean body weight 72.3 kg and mean BMI of 27 kg/m2. 62.5% patients were male and 57.8% were reported to be on statin therapy at baseline. All 2804 patients were on antidiabetic medications with 15.4% patients on monotherapy and rest were on two or more than two antidiabetic medications at baseline. The baseline triglycerides and HbA1C values were 312.3 mg/dL and 8.3% respectively. At 3 months follow-up, use of saroglitazar 4 mg led to significant reduction in TG (35.8%), LDL-C (16.4%), total cholesterol (19%) and non-HDL-C (23.4%). Addition of saroglitazar to baseline antidiabetic medications showed a significant 0.9% absolute reduction in HbA1c with significant improvement in fasting and post prandial plasma glucose. No serious adverse events, alteration in liver or renal enzymes and edema or weight gain were reported.

Conclusion

Authors found that Saroglitazar is a very effective therapeutic option in diabetic dyslipidemia with very high triglycerides level.

References

1. C. Langenberg, S.J. Sharp, P.W. Franks, et al. Gene lifestyle interaction and type 2 diabetes: the EPIC interact case-cohort study PLoS Med 2014;11.
2. Muačević-Katanec D, Reiner Z. Diabetic dyslipidemia or 'diabetes lipidus'? Expert Rev CardiovascTher. 2011;9:341-348.
3. Chang F, Jaber LA, Berlie HD, O'Connell MB. Evolution of peroxisome proliferator-activated receptor agonists. Ann Pharmacother. 2007;41:973-83.
4. Mooradian A. Dyslipidemia in type 2 diabetes mellitus. Nat ClinPractEndocrinolMetab. 2009;5:150–159.
5. Satchell S, Tooke JF. What is the mechanism of microalbuminuria in diabetes: a role for the glomerular endothelium? Diabetologia 2008;51:714–725.
6. A.J. Cooper, N.G. Forouhi, Z. Ye, et al. Fruit and vegetable intake and type 2 diabetes: EPIC-InterAct prospective study and meta-analysis. Eur J ClinNutr 2012;66:1082-1092.
7. L.M. O'Connor, M.A. Lentjes, R.N. Luben, et al. Dietary dairy product intake and incident type 2 diabetes: a prospective study using dietary data from a 7-day food diary. Diabetologia 2014;57:909-917.
8. Pai V, Paneerselvam A, Mukhopadhyay S, Bhansali A, Kamath D, Shankar V, Gambhire D, Jani RH, Joshi S, Patel P. A multicenter, prospective, randomized, double-blind study to evaluate the safety and efficacy of saroglitazar 2 and 4 mg compared to pioglitazone 45 mg in diabetic dyslipidemia (PRESS V). Journal of diabetes science and technology. 2014 Jan;8(1):132-41.
9. A.P. Morris, B.F. Voight, T.M. Teslovich, et al. Large- scale association analysis provides insights into the genetic architecture and pathophysiology of type 2 diabetes Nat Genet 2012;44:981-990.
10. 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. 2016;6(9):11-14.
11. Krishnappa M, Patil K, Parmar K, Trivedi P, Mody N, Shah C, Faldu K, Maroo S, Parmar D. Effect of saroglitazar 2 mg and 4 mg on glycemic control, lipid profile and cardiovascular disease risk in patients with type 2 diabetes mellitus: A 56-week, randomized, double blind, phase 3 study (PRESS XII study). Cardiovascular diabetology. 2020 Dec;19(1):1-3.
12. Mori D, Miyagawa S, Matsuura R, Sougawa N, Fukushima S, Ueno T, Toda K, Kuratani T, Tomita K, Maeda N, Shimomura I. Pioglitazone strengthen therapeutic effect of adipose-derived regenerative cells against ischemic cardiomyopathy through enhanced expression of adiponectin and modulation of macrophage phenotype. CardiovascDiabetol. 2019;18.
13. Shetty SR, Kumar S, Mathur RP, Sharma KH, Jaiswal AD. Observational study to evaluate the safety and efficacy of saroglitazar in Indian diabetic dyslipidemia patients. Indian heart journal. 2015 Jan 1;67(1):23-6.