

Improvement in lipid profile of the patients with saxagliptin as add on therapy in patients of uncontrolled type 2 DM who were on metformin alone

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Abstract

Introduction: Diabetes is characterized by chronic hyperglycemia and deranged carbohydrate, lipid and protein metabolism. This study shows an improvement in lipid profile (TC, TG, LDL and HDL) with saxagliptin in patients of uncontrolled type 2 diabetes mellitus (T2DM) who were previously on metformin monotherapy.

Materials and Method: A total of 30 patients with uncontrolled diabetes were enrolled, who were on metformin 1500 mg daily. Patients were given metformin 500 mg twice a day and saxagliptin 2.5 mg once a day. Patients were followed up at 1st, 3rd and 6th month and lipid profile (TC, TG, LDL and HDL) was estimated.

Results: The mean age \pm SD in males and females was 61.42yrs \pm 6.99 and 55.93yrs \pm 5.74 respectively. The mean change in value from baseline at 24 weeks was TC= 9.66%, TG= 9.40%, LDL= 14.87%, HDL= 5.63%. A highly significant difference was seen at 0 v/s 1, 0 v/s3 and 0 v/s 6 months in lipid profile values.

Conclusion: Saxagliptin has shown an improvement in lipid profile (TC, TG, LDL, HDL) during 6 months of treatment duration in patients of T2DM.

Keywords: Saxagliptin, Uncontrolled Type 2DM, Metformin, Lipid Profile.

Introduction

In India 69.2 million people were living with diabetes (8.7%) as per the 2015 data. Of these, it remained undiagnosed in more than 36 million people.⁽¹⁾ The pathogenic processes involved in the development of diabetes range from autoimmune destruction of the β -cells of the pancreas with consequent insulin deficiency to abnormalities that result in insulin resistance. Long-term complications of diabetes include hypertension and abnormalities of lipoprotein metabolism, which causes increased incidence of atherosclerotic cardiovascular, peripheral arterial and cerebrovascular disease.⁽²⁾ Elevated cholesterol levels, are believed to be a major factor in promoting atherosclerosis, it is now recognized that triglycerides are an independent risk factor. Atherosclerosis is characterized by the deposition of cholesterol arterial wall. In DM, prolonged elevated levels of VLDL, IDL, chylomicron remnants and LDL occur in the blood.⁽³⁾ DM is reaching potentially epidemic proportions in India. The morbidity and mortality associated with diabetes and its complications are enormous and pose significant healthcare burdens on both families and society. In India, the steady migration of people from rural to urban areas, the economic boom, and corresponding change in lifestyle are all affecting prevalence of diabetes.

Materials and Method

It was a randomized, prospective, comparative, interventional study conducted in the department of Pharmacology and department of Medicine at Dr.

Rajendra Prasad Govt. Medical College, Kangra at Tanda after getting approval from Protocol Review Committee and Institutional Ethics Committee.

Inclusion criteria: Patients aged between 18 to 80 years with T2DM, taking metformin in the dose of 1500 mg having HbA1c levels 7% to 10% along with FPG levels \geq 126 mg/dl and / or 2hPG \geq 200 mg/dl were included in the study.

Exclusion criteria: Patients with

1. Acute complications of diabetes.
 - a) Hyperglycemic hyperosmolar state.
 - b) Diabetic ketoacidosis.
2. Renal or liver disease.
3. Congestive heart failure.
4. Acute coronary syndrome.
5. Pregnancy

Methods

Total 30 patients were enrolled after screening for diabetes status with the help of HbA1C, FPG, PPPG. Detailed history taking, clinical examination and lab investigation including lipid profile (TC, TG, LDL, HDL) were done. Patients were given 500 mg metformin twice a day and 2.5 mg saxagliptin once a day. The patients were followed up at 1st 3rd and 6th month. Lipid profile was repeated on each follow up.

Statistical analysis: At the end of 6th month analysis was done using Microsoft excel version 2013.

Result

Out of 30 patients, 14 were males and 16 were females. The mean age (\pm SD) in males and females was 61.42 yrs \pm 6.99 and 55.93 yrs \pm 5.74 respectively.

Graph 1: Mean age \pm SD in years

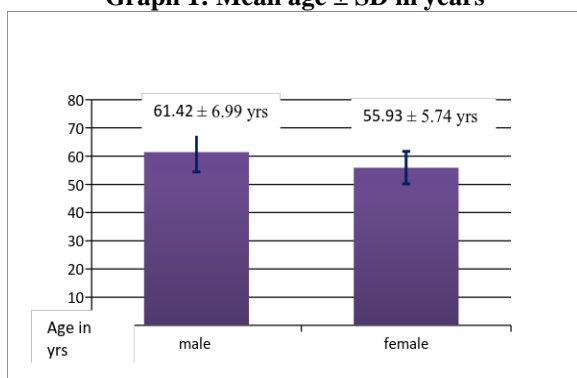


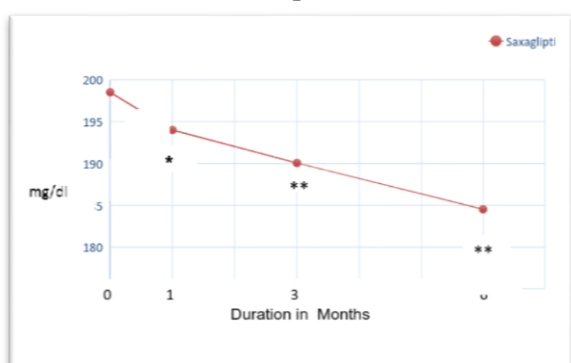
Table 2: Decrease in TC levels over a period of 6 months

Investigation	Duration (Month)	(Mean \pm SD)
TC	0	199.73 \pm 19.91
	1	194.30 \pm 23.10*
	3	190.88 \pm 20.59**
	6	183.80 \pm 17.84**

Unit – mg/dl, Normal value: < 200mg/dl

Mean change in TC from baseline at 24 weeks was 8.66%.

Graph 2



* P value \leq 0.05 at 0 vs 1, and ** p < 0.001 at 0 vs 3 and 0 vs 6 months.

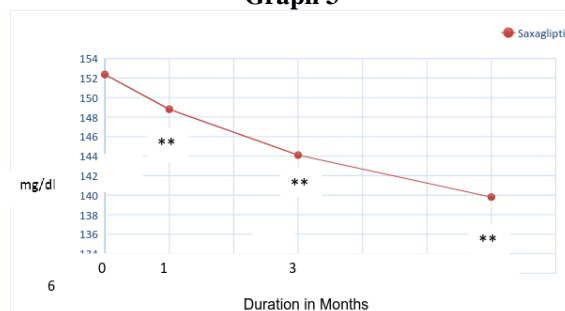
Table 3: Changes in TG levels over a period of 6 months

Investigation	Duration (Month)	Saxagliptin (Mean \pm SD)
TG	0	150.76 \pm 12.96
	1	146.46 \pm 12.38**
	3	141.30 \pm 12.30**
	6	137.80 \pm 13.29**

Unit – mg/dl, Normal value: <150 mg/dl

Mean change in TG from baseline at 24 weeks is 9.40%.

Graph 3



** P value \leq 0.001 at 0 vs 1, 0 vs 3 and 0 vs 6 months in intra group comparison.

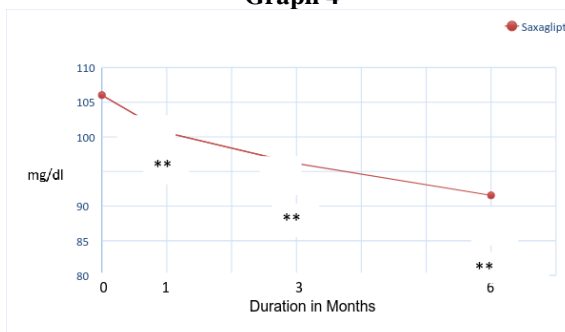
Table 4: Changes in LDL levels over a period of 6 months

Investigation	Duration (Month)	Saxagliptin (Mean \pm SD)
LDL	0	103.73 \pm 15.38
	1	99.15 \pm 15.38**
	3	94.50 \pm 13.91**
	6	90.30 \pm 13.67**

Unit – mg/dl, Normal value: 60-130 mg/dl

Mean change in LDL from baseline at 24 weeks is 14.87%.

Graph 4



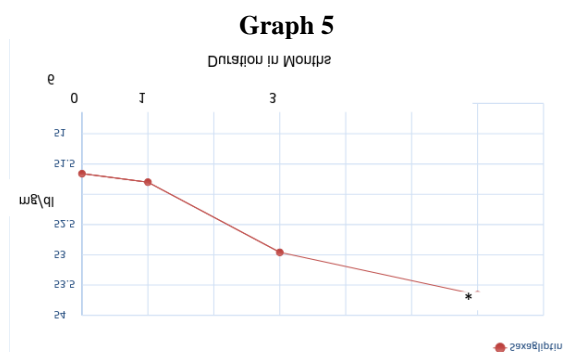
** P value \leq 0.001 at 0 vs 1, 0 vs 3 and 0 vs 6 months in intra group comparison.

Table 5: Changes in HDL levels over a period of 6 months

Investigation	Duration (Month)	Saxagliptin (Mean \pm SD)
HDL	0	52.34 \pm 5.41
	1	52.23 \pm 4.39
	3	52.88 \pm 4.23
	6	55.46 \pm 4.02*

Unit – mg/dl, Normal value: 30-65 mg/dl

Mean change in HDL from baseline at 24 weeks is 5.63%.



* P value ≤ 0.05 at 0 vs 6 months in intra group comparison.

Discussion

It is well established that patients with type 2 diabetes mellitus (T2DM) are at increased risk of cardiovascular (CV) disease.^(5,6) Therefore, it is important to consider the effects of glucose-lowering medications not only on glycemic control, but also on cardiovascular risk.^(7,8) Saxagliptin belongs to dipeptidyl peptidase inhibitors which prevent deactivation of glucagon like peptide (GLP-1) and glucose dependent insulinotropic polypeptide. Both GLP-1 and glucose dependent insulinotropic polypeptide are secreted from gut, they decrease glucose level by secreting insulin.

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