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PHARMACOTHERAPEUTIC ASSESSMENT OF SITAGLIPTIN-METFORMIN COMBINATION FOR DIABETICS

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ABSTRACT

The glycemic effectiveness and safety of the formulation of sitagliptin-metformin were evaluated in type 2 diabetics. In this analysis, 40 drug-naive type-2 diabetics were randomized on an average to receive sitagliptin/metformin 100/500mg OD. Fasting glucose levels, postprandial plasma glucose levels, glycated haemoglobin levels, total cholesterol levels, triglycerides levels, high density lipoproteins levels, low density lipoproteins levels and very low density lipoproteins levels were taken as parameters. Initial management by sitagliptin-metformin FDC resulted in better glycemic regulation, identical weight reduction and fewer stomach pain and diarrhea cases.

KEYWORDS

Diabetes mellitus, DPP-4, Biguanides, Metformin and Sitagliptin.

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INTRODUCTION

Diabetes is a chronic and intermittent disorder characterized by insulin resistance, impaired insulin production and abnormal glucose release. All diabetic patients require the same amount of insulin to maintain glycemic control, according to the findings of the UK Prospective Diabetes Research and the Diabetes Management and Complications Trial. A general carbohydrate treatment target of 7% for HbA1c is recommended. An expert panel has established a goal of 6% HbA1c. Although data from the 1988-1994 National Health and Nutrition Examination Survey and the 1999-2000 National Health and Nutrition Examination Survey shows that rates of HbA1c levels of 43 percent and 44.3

percent are effective, respectively, of all anti-diabetic agents function in metformin's use as the primary anti-only drug, these guidelines are not always pursued (AHA). Patients taking metformin alone can struggle to retain glycemic control. Furthermore, owing to the progressive nature of Type 2 DM, patients who achieve their glycemic goal on monotherapy will need further care in the future. Volume sitagliptin is the first-line therapy for Type 2 diabetes mellitus in patients with low to medium HbA1c levels. Sitagliptin is a DPP-4 dipeptidase inhibitor that prolongs the hydrolysis and inactivation of glucagon-like peptide-1 (GLP-1) and glucose-dependent insulinotropic peptide (GIP) levels in people with type 2 diabetes. Sitagliptin 100mg once daily helps people with type 2 diabetes manage an average glucose level. Sitagliptin may not seem to be associated with an elevated risk of hypoglycemia, whether administered individually or in combination with other non-hypoglycemic medicines. In people with type 2 diabetes, the combination of sitagliptin and metformin reduces blood glucose levels. With HbA1c levels ranging from 7.5 to 11%, the effects of beginning sitagliptin and other therapies are additive. In a long-term trial, it was discovered that glycemic products would last for up to 54 weeks. A fixed-dose combination (FDC) tablet has been developed and approved to treat Type 2 diabetes. This research aimed volumes to see whether sitagliptin/metformin has any benefits or side effects in newly diagnosed type 2 diabetes patients with moderate hyperglycemia.

OBJECTIVES

- To study the effects on fasting plasma glucose and glycated hemoglobin.
- To observe the results of these drugs on lipid profile in the same patients.
- To observe the effects of these drugs on renal functions in the same patients.

METHODS

The present study entitled "Comparison of efficacy and safety of Sitagliptin-Metformin in Type 2 Diabetes Mellitus patients" was conducted in the Department of Pharmacology and Department of Medicine, NIMS and R, Jaipur. A was prospective study was conducted on the patients of Type 2 Diabetes Mellitus attending or admitted in OPD or IPD of Department of Medicine, NIMS and R and Jaipur.

Ethical clearance

The Institutional ethics committee approved the study protocol and was approved by the Institutional ethics committee of NIMS and R, Jaipur.

Informed and Written Consent

The participants were told of all potential consequences of the research, including sound and immoral. Before enrolling patients in the study, researchers obtained informed permission from them.

Study design

The design of the study is randomized, open-label, prospective, parallel-group. Patients enrolled were randomized into a group of 49 Participants.

Patient inclusion criteria

- Newly detected type 2 DM patients.
- Poorly controlled diabetics on oral hypoglycemic agents.
- Adults of either sex

Patient exclusion criteria

- Type 1 Diabetes Mellitus
- Diabetic Nephropathy
- Diabetic Ketoacidosis (DKA)
- Patients on insulin
- Congestive Heart Failure (CHF)
- Acute infection
- Psychotic patient
- Pregnancy
- HIV/HBsAg/Anti-HCV and immuno-compromised patients
- Patients on corticosteroid therapy
- Patients with other comorbid condition such as HTN, CAD, CVA
- Patients on Drugs (other than for T2DM), which are known to affect the blood sugar levels Patients not willing to sign a consent/participate in the study.

Diagnosis of DM

The diagnosis of Type 2 Diabetes Mellitus was made based on definite clinical history, assessment and examinations according to Performa enclosed here with.

Study Groups

Patients were assigned to a study group after final diagnosis and implementation of inclusion and exclusion criteria. They received Tab. Sitagliptin 100mg OD + Tab. Metformin 500mg OD.

The drugs under study were obtained from the same Pharmaceutical company/Brand throughout the study.

All the participants were regularly followed at 6, 12, 18 and 24 weeks with undergoing investigations:

- Haemogram
- Glycosylated Hemoglobin HbA1c
- Urine - Routine

Plasma Glucose (PG)

a. Fasting PG

b. 2 hours PPG

- Lipid Profile (TC, TG, HDL, LDL, VLDL)
- Hepatic Function Test
- C-reactive protein
- Electrocardiogram (ECG)

Laboratory investigation methodology

The investigations were carried out in laboratories of NIMS and R, Jaipur.

Haemoglobin percent

Hemoglobin percent was Low-density estimation was carried out by Lab Life H3D Premier, Auto Hematology Analyzer from RFCL Limited.

Principle

It uses Colorimetric method for Hb percent evaluation

Normal Hb% value in adults = 11 - 16g%

Blood Glucose estimation (done by Autozyme Kit, Accurex Biomedical Pvt. Ltd.)

Method

Glucose Peroxidase and oxidase methods were used.

Principle

Enzyme Glucose oxidase tends to convert glucose to gluconic acid. During the reaction, $H_2O_2$is formed, which in the average presence of peroxidase couples with 4-amino-antipyrine to develop red-colored volumes dye quinone imine.

$$\beta\text{-D-Glucose} + \text{oxygen water} \xrightarrow{\text{Glucose oxidase}} \text{Gluconic acid} + \text{hydrogen}$$

$$\text{Hydrogen Peroxide} + \text{4-aminoantipyrine} + \text{phenol} \xrightarrow{\text{Catalase}} \text{Red dye} + \text{water}$$

Sample collection

Fasting Plasma Sugar (FPS): A blood sample was collected after overnight fasting.

Postprandial Plasma Sugar (PPS): A blood sample was collected 2 hours after meal ingestion.

Reagents

- Reagent I: Enzyme
- Reagent II: Glucose diluents
- Reagent III: Glucose standard, 100mg/dl

Preparation of working glucose solution

100ml of reagent II is dissolved in 1 vial of reagent I.

Procedure

After mixing correctly, absorbance was measured at 505nm.

Calculation: Glucose in mg %= (Abs. of test / Abs. of std.) × 100

Lipid profile tests

Estimation of total cholesterol (by Enzokit, RFCL Limited)

Method

Total cholesterol estimation by enzymatic estimation

Principle

At 500nm, the strength of the color produced is proportional to the cholesterol concentration.

Reagents

Reagent I: Buffer (PIPES Buffer + Phenol + Sodium Cholate)

Reagent II: Enzymes (Cholesterol esterase + Cholesterol oxidase + Peroxidase + 4-amino antipyrine)

Reagent III: Standard (Cholesterol 200mg/dl)

Preparation of working solution

Equal volume of reagent I and II were mixed.

Procedure

Mixed and incubated for 5 min. At 37°C. Absorbance measured at 500 nm.

Calculations

Cholesterol conc. (mg/dl) = (Abs. of test - Abs. of blank) x 200 / (Abs. of standard - Abs. of blank)

Normal values in adults = <200mg/dl

Estimation of triglyceride (by Enzokit, RFCL Limited)

Method

Enzymatic estimation by Glycerol phosphate oxidase and peroxidase method.

Principle

Lipase

Triglyceride + water ----------> Glycerol + free fatty acids

At 546nm, the absorbance of the pigment is equal to the triglyceride concentration.

Reagents

Reagent I: Triglyceride Reagent (PIPES Buffer + 4-amino antipyrine + Glycerol phosphate oxidase + Lipase + Glycerol kinase + peroxidase)

Reagent II: Standard (Triglyceride 200mg/dl)

Procedure

Mixed and incubated for 5 min. At 37°C. Absorbance measured at 500nm.

Calculations

Triglyceride conc. (mg/dl) = (Abs. of test - Abs. of blank) x 200 / (Abs. of standard - Abs. of blank)

Normal value in adults = Men: 60-165mg/dl

Female: 40-140mg/dl

Estimation of High-density lipoprotein (HDL)

Method: Direct HDL method.

Principle

By using blocking reagents, apoB-containing lipoproteins are made inactive (enzymatic cholesterol reagent). Thus, lipoproteins comprising apoB are essentially omitted from the assay, leaving only HDL-chol to be identified.

1) ApoB containing lipoproteins + SO_4 soluble □-cyclodextrins + Mg^{2+}+ Dextran ----------> non- reactive complexes with ApoB containing lipoproteins

PEG-cholesteryl esterase

2) HDL-cholesteryl esters ----------> HDL-unesterified cholesterol + Fatty acid

PEG-cholesterol oxidase

3) Unesterified chol. + O_2 ----------> Cholestenone + H_2O_2

4) H_2O_2 + 5-aminophenazone + H^+ peroxidase N-ethyl-N-(3-methylphenyl)- ----------> quinoneimine dye + H_2O

N-succinyl ethylene diamine + H_2O

Absorbance is measured at 600nm.

Normal value in adults = >40mg/dL.

Estimation of Very low density lipoprotein (VLDL)

VLDL (mg/dL) = Triglycerides/5

Normal value in adults = 2 to 38mg/dL

Estimation of Low-density lipoprotein (LDL)

LDL (mg/dL) = Total cholesterol - (HDL+VLDL)

Normal value in adults = 60 to 130mg/dL

Safety Assessments

Each visit included a report of any harmful effects encountered by the patient or witnessed by the investigator. At the outset of the baseline phase and each appointment, a medical test was conducted, including vital signs. Additional standard laboratory safety checks, such as hepatic function tests, electrocardiograms (ECGs) and X-rays for the chest, were conducted as a necessity.

Statistical analysis

- The mean and standard deviation of all values is calculated.
- The Student's Paired T-test was used to assess the statistical importance of each category's pre-and post-treatment values.
- ANOVA was used to ascertain the mathematical significance of the groups, which Turkey then evaluated.
- P0.05 was considered statistically significant.
- Statistical analysis was performed using the SPSS-20 program.

OBSERVATIONS AND RESULTS

The current research was conducted in the Department of Pharmacology and Department of Medicine, NIMS and R, Jaipur, from 1 January 2019 to 30 June 2020. It was conducted on Type 2 Diabetics in the Out-Patient Department or In-Patient Department of the Department of Medicine, NIMS and R, Jaipur. The study is randomized, open-label and prospective. All patients underwent

clinical and laboratory examination at 0, 6, 12, 18 and 24 weeks of treatment.

In all, 49 patients were included in the research, nine of which were unable to report on subsequent visits and were thereby omitted.

The observations made during the study were as follow:

Mean age of patients: volumes

Mean age of patients was 50.39 ± 11.05 {Age (in years) Mean ± SD}

Gender distribution of patients

Body Mass Index (BMI)

Body Mass Index of patients is 29.51 ±2.30 (kg/m²) {Mean ± SD}

Hemoglobin

The hemoglobin percent of patients under study is detailed in table 5. At week 0, the mean hemoglobin was not significantly different. After 24 weeks of treatment, the mean hemoglobin raised, but this increase was not statistically significant.

Fasting Plasma Glucose (FPG)

At week 0, the mean FPG was 192.94mg/dl, which was reduced to 127.97mg/dl, 122.01mg/dl, 117.87 and 103.23 mg/dl in 6, 12, 18 and 24 weeks, respectively. Details are given in Table No.6.

2 hours Postprandial Plasma Glucose (PPG)

At 0 week, mean PPG was 252.98mg/dl which reduced to 167.90mg/dl, 163.00mg/dl, 167.44mg/dl, and 159.51mg/dl in 6, 12, 18 and 24 weeks, respectively. Details are given in Table No.7.

Glycosylated Haemoglobin (HbA1c)

Mean HbA1c reduced by 44.39% in the group as illustrated in Table No.8.

Lipid profile

Total Cholesterol

At 0 weeks, the mean total cholesterol (mg/dL) was 222.82 in the group. After 24 weeks of treatment, the mean total cholesterol was 214.92. The change was statistically insignificant, as can be seen in Table No.9 and Table No.10.

Triglycerides

At 0 week, the mean triglycerides (mg/dL) was 133.92 in the group. After 24 weeks of treatment, mean triglycerides (mg/dl) was 128.90. The change was statistically insignificant, as can be seen in Table No.9 and Table No.10.

High-Density Lipoprotein (HDL)

At 0 weeks, the mean HDL (mg/dL) was 48.02 in the group. After 24 weeks of treatment mean HDL (mg/dL) 51.33. The change was statistically insignificant, as can be seen in Table No.9 and Table No.10.

Low-Density Lipoprotein (LDL)

At 0 weeks, the mean LDL (mg/dL) was 111.73 in the group. After 24 weeks of treatment, mean LDL (mg/dL), 107.29. The change was statistically insignificant, as can be seen in Table No.9 and Table No.10.

Very Low-Density Lipoprotein (VLDL)

At 0 weeks, the mean LDL (mg/dL) was 26.92 in the group. After 24 weeks of treatment, the mean VLDL (mg/dL) was 25.78. The change was statistically insignificant, as can be seen in Table No.9 and Table No.10.

Liver Function Test (LFT)

Total bilirubin

At 0 weeks, the mean total bilirubin (mg/dL) was 0.80 in the group. After 24 weeks of treatment, the mean total bilirubin (mg/dL) was 0.81. The change was statistically insignificant, as can be seen in Table No.11 and Table No.12.

Aspartate Transaminase (AST)

At 0 weeks, the mean AST (IU/L) was 29.81 in the group. After 24 weeks of treatment, the mean AST was 27.54. The change was statistically insignificant, as can be seen in Table No.11 and Table No.12.

Alanine Transaminase (ALT)

At 0 weeks, the mean ALT (IU/L) was 24.51 in the group. After 24 weeks of treatment, the mean ALT (IU/L) was 22.60. The change was statistically insignificant, as can be seen in Table No.11 and Table No.12.

Alkaline Phosphatase (ALP)

At 0 weeks, the mean ALP (IU/L) was 50.01 in the group. After 24 weeks of treatment, the mean ALP (IU/L) was 70.02. The change was statistically insignificant, as can be seen in Table No.11 and Table No.12.

DISCUSSION

After 24 weeks of therapy, the mean hemoglobin rose, but the improvement was not statistically meaningful, meaning that the medication category had little effect on hemoglobin percent. Fasting plasma glucose levels decreased gradually in the group. After six weeks, there was a substantial decline in FPG amounts (p0.05). After 12 weeks, the Group demonstrated a highly significant decrease in FPG levels compared to their 0-week FPG levels. After 18 weeks, the Group achieved a highly substantial reduction in FPG levels relative to baseline. At the end of the analysis, the Group had decreased by a significant (p0.001) amount from its week 0 mark. After the investigation, FPG amounts had been reduced by 44.96 percent. After six weeks, the participant demonstrated a substantial drop in PPG levels (p0.05) instead of their weak 0 PPG levels (Effect of intensive blood-glucose control with metformin on complications in overweight patients with type 2 diabetes, UKPDS 34, 1998). There was no substantial decrease in PPG levels in the group. After 12 weeks, the group demonstrated a significant drop of PPG levels (p0.05) instead of week 0 PPG levels. At 12 weeks, there was no substantial decrease in PPG levels in the group. After 18 weeks, the participant demonstrated a considerable drop in PPG levels (p0.05) instead of their week 0 PPG levels. At 18 weeks, there was no substantial reduction in PPG levels in the group. After the analysis, the Group demonstrated an enormously significant drop in PPG levels instead of the baseline stage in week 0. The Group showed a 37.06 percent decline in PPG levels after the analysis. After 12 weeks of therapy, the group's HbA1c level was significantly lower than at week 0. After 24 weeks, the Group demonstrated a highly substantial decrease in glycosylated hemoglobin levels instead of baseline levels.

After the research, total cholesterol (TC), triglycerides (TG), low-density lipoprotein (LDL), and very-low-density lipoprotein (VLDL) amounts are lower than they were at the start of the study. This decline, though, is not statistically substantial. HDL levels increased at the end of the analysis as compared to the 0-week mark. This rise, however, is not statistically meaningful. At weeks 0 and 24, there is a slight difference in overall bilirubin (direct/indirect), AST, ALT and ALP amounts. This improvement, however, is not statistically significant.

Patients with type 2 diabetes are frequently prescribed metformin as a first-line medication[1]. This recommendation is based on the drug's beneficial medical effects, including elevated glycemic efficacy, reduced risk of hypoglycemia and mild weight loss[1]. In addition, metformin monotherapy was successful in a UKPDS substudy of overweight type 2 diabetes patients[2]. Despite metformin's well-documented benefits, a significant proportion of patients on metformin monotherapy struggle to achieve their glycemic targets. This is confirmed by the fact that at week 18, almost one-third of patients on metformin monotherapy had a HbA1c of 7%. Previous research[3] discovered that sitagliptin and metformin had higher glycemic potency, which can be explained by the partly complementary mechanisms by which sitagliptin and metformin improve glucose control. Metformin lowers insulin tolerance and hepatic glucose consumption, while sitagliptin slows GLP-1 and GIP inactivation, increasing insulin release and lowering glucagon secretion[4,5]. Furthermore, a previous report shows that metformin therapy improves total GLP-1 (active + inactive), potentially complementing the effects of the DPP-4 receptor sitagliptin[6]. Previous findings[6] showed that adding metformin and sitagliptin resulted in a significantly higher increase in active GLP-1 levels than either sitagliptin or metformin monotherapy. Besides better glucose balance, sitagliptin/metformin FDC improved fasting-cell function tests (HOMA- and proinsulin/insulin ratio) significantly more than metformin monotherapy. HOMA is a surrogate endpoint for determining pancreatic cells' ability to secrete insulin during fasting. The proinsulin/insulin ratio is a marker that is thought to increase in response to defective pancreatic -cells' insufficient insulin expression[7,8].

According to these cell activation markers, the use of sitagliptin and metformin FDC seems to be more successful than metformin monotherapy. To ascertain the clinical importance of these advances, further long-term data research will be needed. Patients who received metformin monotherapy and sitagliptin/metformin FDC lose almost the same volume of weight as those who received sitagliptin/metformin FDC. In AHA therapy participants, weight gain and intensive glycemic control were related[9]. The improved glycaemic control observed in sitagliptin/metformin FDC did not negate the weight loss recorded in this study of metformin monotherapy. This finding indicates that sitagliptin does not interfere with metformin-induced weight loss after a steady rise in glycemic control[10]. A significant disadvantage to combination therapies over monotherapy is the possibility of adverse side effects. However, according to this report, the overwhelming majority of patients accepted both sitagliptin/metformin FDC and metformin monotherapy.

While there was a significant increase in glycemic control in this study with sitagliptin/metformin FDC, the low occurrence of hypoglycemia is consistent with the glucose-dependent mode of action of DPP-4 inhibition[11], as shown in other studies using sitagliptin as monotherapy or in combination with AHAs that do not trigger hypoglycemia.

Like other antihyperglycemic antidepressants, Sitagliptin has been related to an increased risk of hypoglycemia when associated with insulin or sulfonylureas, non-glucose-dependent antihyperglycemic drugs[12,13]. Between the sitagliptin/metformin FDC and metformin monotherapy groups, the incidences of gastrointestinal adverse effects in general and nausea and vomiting in specific, was similar. On the other hand, stomach pain and diarrhea were less frequent with sitagliptin/metformin FDC than metformin monotherapy. This finding is in line with a previous study, which found that T2DM patients who received initial combination care with sitagliptin and metformin (administered as individual tablets taken concurrently) experienced substantially less abdominal pain and diarrhea than those who received metformin monotherapy[3]. Although the process by which sitagliptin and metformin combined therapy decreased abdominal pain and diarrhea in these trials is unclear, similar results were seen in another study using a different DPP-4 inhibitor in conjunction with metformin[14]. More research is needed to back up these conclusions. In conclusion, care with sitagliptin/metformin FDC for 18 weeks resulted in significantly more significant HbA1c decreases than metformin monotherapy, with a higher proportion of patients meeting their glycemic target. The sitagliptin/metformin FDC resulted in similar weight loss, hypoglycemia rates and abdominal pain and diarrhea rates that were marginally lower.

Table No.1: Procedure for Plasma Glucose Level

S.No		Test Serum (T)	Standard (S)	Blank
1		0.1ml	0.1ml	-
2	Working Glucose solution	1.0ml	1.0ml	1.0ml
	Mixed well. Incubated at 37ºC for 7 minutes.			

Table No.2: Volumes: Procedure for Lipid Profile Test

S.No		Test(T)	Standard(S)	Blank
1	Working Reagent	1.0ml	1.0ml	1.0ml
2	Standard	-	10µl	-
3	Test Serum	10µl	-	-

Table No.3: Procedure for Triglyceride estimation

S.No		Test (T)	Standard (S)	Blank
1	Triglyceride Reagent	1.0ml	1.0ml	1.0ml
2	Standard	-	10µl	-
3	Test Serum	10µl	-	-

Table No.4: Gender distribution of patients across the group

S.No	Total (N)	Male	Percentage	Female	Percentage
1	40	21	52.5%	19	47.5%

Table No.5: Haemoglobin percentage of patients at week 0 and 24

S.No		0 week (g/dL) Mean ± SD	24 weeks (g/dL) Mean ± SD
1	**Haemoglobin Percent**	12.05 ± 1.51	12.52 ± 1.59

Table No.6: FPG Levels of patients across the study

	Baseline (mg/dl) Mean ± SD	6 weeks (mg/dl) Mean ± SD	12 weeks (mg/dl) Mean ± SD	18 weeks (mg/dl) Mean ± SD	24 weeks (mg/dl) Mean ± SD	% reduction
FPG	192.94 ± 32.03	127.97 ± 10.12^{a1}	122.01 ±8.96^{b1}	117.87±10.95^{b2}	103.23 ± 15.63^{c3}	44.96%

Note: Values are mean ± SD; a p<0.05, b p<0.01, c p<0.001 compared to the 0-week value of the group.

Table No.7: PPG Level of patients across the study

	Baseline (mg/dl) Mean ± SD	Six were weeks (mg/dl) Mean ± SD	12 weeks (mg/dl) Mean ± SD	18 weeks (mg/dl) Mean ± SD	24 weeks (mg/dl) Mean ± SD	% reduction
PPG	252.98±35.19	167.90 ± 8.00^{a}	163.00 ± 6.92^{a}	167.44± 6.77^{a}	159.51±5.97^{b}	37.06%

Note: Values are mean ± SD; a p<0.05, b p<0.01 compared to "0" week value

Table No.8: HbA1c Level of patients across the study

	Baseline (%) Mean ± SD	12 weeks (%) Mean ± SD	24 weeks (%) Mean ± SD	Percentage reduction
HbA1c	10.69±1.91	6.71±1.57^{c}	5.87±1.69^{c}	44.39%

Note: Values are mean ± SD; a p<0.05, b p<0.01, c p<0.001 compared to 0-week value.

Table No.9: Lipid Profile of patients at week 0

	Total cholesterol (TC) (mg/dl) Mean ± SD	Triglycerides (TG) (mg/dl) Mean ± SD	High Density Lipoprotein (HDL) (mg/dl) Mean ± SD	Low Density Lipoprotein (LDL) (mg/dl) Mean ± SD	Very Low Density Lipoprotein (VLDL) (mg/dl) Mean ± SD
Lipid Profile at 0 week	222.82 ±12.63	133.92 ±12.53	47.92 ± 7.28	111.73 ± 11.52	27.01 ± 2.63

Table No.10: Lipid Profile of patients at week 24

	Total cholesterol (TC) (mg/dl) Mean ± SD	Triglycerides (TG) (mg/dl) Mean ± SD	High Density Lipoprotein (HDL) (mg/dl) Mean ± SD	Low Density Lipoprotein (LDL) (mg/dl) Mean ± SD	Very Low Density Lipoprotein (VLDL) (mg/dl) Mean ± SD
Lipid Profile at 24 week	214.92±11.32	128.90±4.94	51.34±7.01	107.29±10.98	25.78±1.07

Table No.11: LFT results at week 0

	Total Bilirubin (direct/ indirect) (mg/dl) Mean ± SD	Aspartate Transaminase (AST) (IU/L) Mean ± SD	Alanine Transaminase (ALT) (IU/L) Mean ± SD	Alkaline Phosphatase (ALP) (IU/L) Mean ± SD
LFT at 0 week	0.80 ± 0.15 (0.30±0.12/0.51±0.27)	29.81 ± 6.17	24.71 ± 3.72	50.01 ± 5.43

Table No.12: LFT results at week 24

	Total Bilirubin (direct/ indirect) (mg/dl) Mean ± SD	Aspartate Transaminase (AST) (IU/L) Mean ± SD	Alanine Transaminase (ALT) (IU/L) Mean ± SD	Alkaline Phosphatase (ALP) (IU/L) Mean ± SD
LFT at 24 week	0.81 ± 0.21 (0.19±0.15/0.71±0.24)	27.53 ± 3.71	27.53 ± 3.71	70.02 ± 11.01

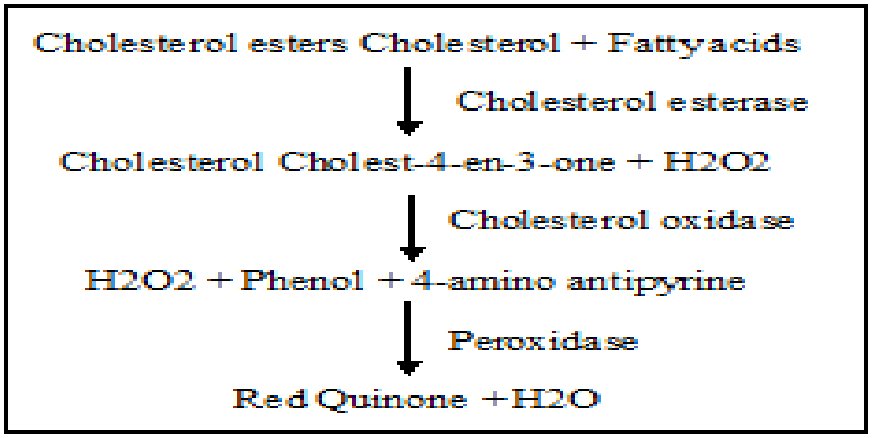

Figure No.1: Principle for Total Cholesterol Estimation

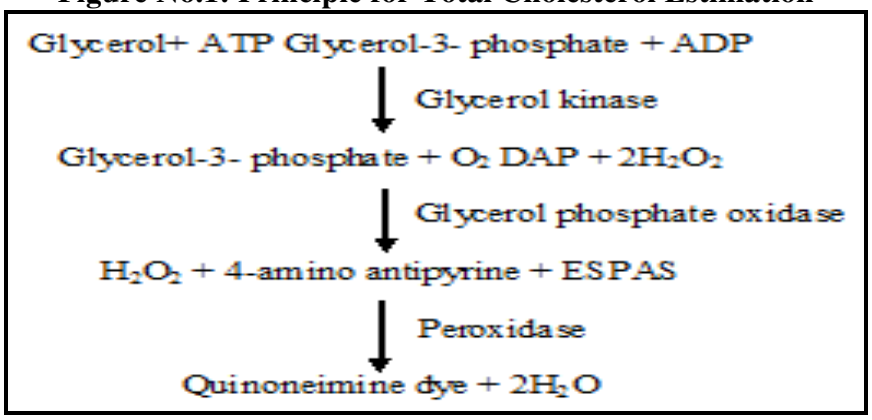

Figure No.2: Principle for Triglyceride Estimation

CONCLUSION

According to this report, the over whelming majority of patients received sitagliptin/metformin fixed dose formulation of 100mg/500mg OD. There was no effect on weight loss, the low occurrence of hypoglycemia is consistent with the glucose-dependent mode of action of DPP-4 inhibition. To ascertain the clinical importance of these advances, further long-term data research will be needed. In this study, the researchers found that the use of sitagliptin and metformin FDC seems to be more successful than metformin monotherapy for improving glycemic control. The incidences of gastrointestinal adverse effects were negligible. On the other hand, stomach pain and diarrhea were less frequent with sitagliptin/metformin. More research is needed to back up these conclusions. In conclusion, care with sitagliptin/metformin FDC for 24 weeks resulted in significantly more HbA1c decreases than metformin monotherapy and thus the efficacy and safety of this formulation was well established in a north-Indian tertiary care hospital.

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CONFLICT OF INTEREST

We declare that we have no conflict of interest.

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