DiabetesAsia Journal

Diabetes Asia Journal
Vol. 2, Issue 2, July 2025, ***Edition****: Online*
Publisher*: Diabetes Asia Journal under JHRC*
eISSN*: 3048-8192*
Journal Homepage*: https://diabetesasia.org/journal/*
Cross Ref DOI: *https://doi.org/10.62996/daj.61042025*

Research Article

The Glycaemia Outcomes of Metformin with Add-on Vildagliptin or Sitagliptin in T2 Diabetes Mellitus

Nallandhigal Harini[1], Burra Sindu Priya[2], Yeddanapudi Sree Himaja[3], Dr. Mohammed Abubakar[4*]

[1,2,3]Interns Department of Pharmacy Practice, Geethanjali College of Pharmacy, Cheeryal (V), Keesara (M), Medchal-Malkajgiri District, Telangana – 501301, India.
[4]Associate Professor, Department of Pharmacy Practice, Geethanjali College of Pharmacy, Cheeryal (V), Keesara (M), Medchal-Malkajgiri District, Telangana – 501301

[4*]Corresponding Author:
Dr. Mohammed Abubakar Pharm. D, Associate Professor, Department of Pharmacy Practice, Geethanjali College of Pharmacy, Cheeryal (V), Keesara (M), Medchal-Malkajgiri District, Telangana – 501301, India
Email: abukhan253@gmail.com, Mobile: 8712247800

Abstract

Introduction:
T2DM is a global health concern requiring effective glycaemia management to reduce complications. While DPP-4 inhibitors like vildagliptin and sitagliptin are widely used in combination with metformin, limited studies have compared their efficacy in lowering plasma glucose levels. This study aims to address this gap by evaluating the effectiveness of these combinations in glycemic control.

Methods:
A comparative observational study on 172 Patients with T2DM patients (⩾30 years) was done with comorbidities like hypertension, dyslipidaemia, and obesity. Inclusion required lab data (FBG, PLBS, HbA1c, Cr, TG) and consent, while exclusions included T1DM, gestational diabetes, insulin therapy, alcohol use, and emergencies. Outcomes assessed were primary (HbA1c), secondary (Cr, TG)

Results and Conclusion:
The study showed that adding vildagliptin or sitagliptin to metformin significantly improved glycaemia control in T2DM over six months. Both combinations effectively reduced FBS, PLBS, HbA1c, and TG without affecting renal function.
In this cohort, patients receiving vildagliptin + metformin demonstrated a greater reduction in blood glucose levels compared to those receiving sitagliptin + metformin.

Keywords

T2DM, Metformin, Vildagliptin, Sitagliptin, Glycaemia control, HbA1C, DPP-4inhibitor

Background

DM encompasses metabolic illnesses distinguished by relentless hyperglycaemia, Stemming from modulation of insulin release and its physiological effects, insulin action, or both. [1]
The yield of insulin spawned by Langerhans organ is crucial for facilitating the body's assimilation of glucose. For an individual who is non-diabetic, Langerhans organ generates more insulin. Whenever BSL rises, insulin signals the bodily cells to ingest glucose. In DM, Langerhans's organ capacity to yield insulin and adaptation are altered. Metformin, a biguanide, primarily reduces hepatic glucose production, while DPP-4 inhibitors enhance incretin activity, offering complementary mechanisms for glycaemia control. [2,10]
T1DM embodies a persistent autoimmune dysfunction primarily distinguished via the devastation of insulin-yielding β - cells which being the principal source of insulin integrated via the Langerhans organ, directing to an absolute deficiency in insulin. [3]

T2DM comes about when bodily cells become inferior and responsive to insulin's efforts to drive glucose onto cells, an illness known as defiance to insulin. Consequently, glucose begins to linger in the blood. [4]
Increment in BSL and prolonged unavailability of hormone may cause ketoacidosis, which accrues ketones within the bloodstream when uses Fat rendering as energy rather than glucose. Ketone makes blood acidic and reduce all body functions. This also eventually render to death. Patients treated with vildagliptin + metformin showed a greater

reduction in blood-glucose levels than those on sitagliptin + metformin, at a time when the 2025 IDF Diabetes Atlas reports approximately 589 million adults (1 in 9) are living with diabetes worldwide—more than 40% of whom remain undiagnosed, underlining the urgent need for effective therapeutic strategies. IDF 2025 data: about 589 million adults (20–79 years) have diabetes, corresponding to 11.1% of that age group (1 in 9). Over 40% of adults with diabetes are undiagnosed, emphasizing the global burden and need for improved treatments. According to the International Diabetes Federation (IDF) Diabetes Atlas 2025, 11.1% of Indian adults aged 20–79 years—approximately 1 in 9—are living with diabetes, and over 4 in 10 of these individuals are unaware of their condition. India remains one of the countries with the highest diabetes burden worldwide, although the prevalence in China is even higher in absolute numbers [2]

"Patients receiving vildagliptin + metformin showed a greater reduction in blood-glucose levels compared to those on sitagliptin + metformin, with the cardiovascular safety of sitagliptin previously established in the TECOS study (Trial Evaluating Cardiovascular Outcomes with Sitagliptin) [Green JB, Bethel MA, Armstrong PW, et al. NJEM 2015;373(3):232-242. doi:10.1056/NEJMoa1501352]. [11] .DPP-IV inhibitors and biguanides, particularly metformin, are frequently articulated in combined therapeutic approaches to manage T2DM. [8]

Prevalence

Global wise

The substantial increment in 2024 is serious worldwide health concern. This increase is causing a strain on worldwide health network and provoking complications for those affected.
In the 2024 epidemiology study the worldwide extensiveness concerning T2DM aged twenty- seventy-nine years is approximately 10.5%. The fast-paced metropolitan growth, dietary changes, and habitual inactivity are significant contributors to this emerging prevalence, with India exhibiting overwhelming rates globally [5]

National wise

India has an estimated 89.8 million adults aged 20–79 years living with diabetes. Additionally, the Atlas estimates that 38.6 million adults in India have UN-diagnosed diabetes, pertaining preponderance of cases. The inquiry implies that nascent DM paces are coupled with socioeconomic disparities,
impacting both awareness and conceptualization of treatment

State-wise

Recent surveys signify that 25% of grouping in Ranga Reddy district suffers from diabetes, as revealed by door-to-door inquiries undertaken between January and August 2024. [6] Another nationwide health inquiry conveyed that around 18% in Telangana are living with high BSL. [7]

This data emphasizes a concern about increasing rates of diabetes, predominantly in certain ages in assorted geographic areas.

Study Design and settings

The Randomized, observational, and prospective inquiry was carried out at Dept. of General Medicine, RVM Hospital (RVM Institute of Med. Science and Research Centre) [Laxmakkapally (V), Mulugu (M), Siddipet (D), TG], from Aug 2024 to Jan 2025.

Study Population and sample size:
The study population will be recruited using a convenient sampling method, targeting both inpatients and outpatients from the RVM hospital across age groups from 30 years. The sample size was determined using the Raosoft online sample size calculator, considering T2DM patients based on 95% confidence level ,5% margin of error and assuming 50% response rate. The estimated sample size was found to be 180 participants. However, the final size obtained was 172. Despite this minor reduction, the remains statistically sufficient for meaningful analysis.

Study Criteria

Inclusion Criteria and Exclusion Criteria:
The study included both male and female of T2DM using metformin with add-on vildagliptin or sitagliptin. Age above 30 years. Subjects with co-morbid conditions, common comorbidities include: HTN, Dyslipidemia, MASLD, Heart disease, Sleep disorders, Cancer, Obesity, and Thyroid Disorders', PLBS, HbA1c, Cr, TGs values available. Outpatients and Inpatients' is interested in participating. Conversely, patients with T1DM, GDM, Denovo DM, Candidates on insulin and or other hypo glycaemia agents, Pregnant, pediatrics, mentally disabled, emergency cases, subjects whose lab data is unavailable, Surgical condition, Patients who consume alcohol.

Randomization and Group Allocation
Eligible participants were randomized using a simple randomization method. Each participant was assigned to one of the two treatment groups using a computer-generated random number table. Both inpatients and outpatients from the general medicine department were considered.

Data Collection Procedure
Data were collected using a standardized patient data form. The following parameters were recorded at three time points: baseline (initial visit), 3rd month, and 6th month:

- Fasting Blood Sugar (FBS)
- Post-Lunch Blood Sugar (PLBS)
- Glycated Hemoglobin (HbA1c)
- Serum Creatinine (Cr)
- Triglycerides (TG)

Participants were followed up through reminders and regular hospital visits to ensure timely laboratory assessments.

Ethical Considerations

The study protocol was reviewed and approved by the Institutional Human Ethics Committee (IHEC) of Geethanjali College of Pharmacy (Ref no: GCPK/PD24/09). Written informed consent was obtained from all participants prior to enrolment. Confidentiality and data privacy were maintained throughout the study.

Statistical Analysis

All collected data were entered into Microsoft Excel (version 2412) and analysed using SPSS version 27 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation (SD), and categorical variables were presented as frequencies and percentages.

Independent t-tests were used to compare mean values between the two treatment groups at each visit.

- Paired t-tests were used for within-group comparisons across time points (initial, 3rd, and 6th months).
- Chi-square test was used to analyse categorical variables (e.g., gender distribution).

And p-value of <0.05 was considered statistically significant

Results

Response Rate: *Here in inquiry, 182 forms were distributed, with 91 forms allocated to regimen1, 91 forms to regimen2. 86 forms were returned from regimen 1, 86 forms from regimen 2, resulting in 172 forms returned. This shows a pace of responsiveness of approximately 94.56%, suggesting a strong engagement from participants in both groups.*

Table 1: Dissemination of subjects by sex

		Number	Percentage
Gender	**Male**	95	55
	Female	77	45
Total		**172**	**100**

Fig 1: Dissemination of subjects by sex

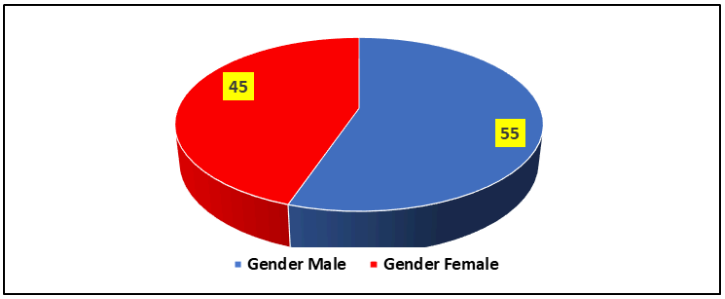
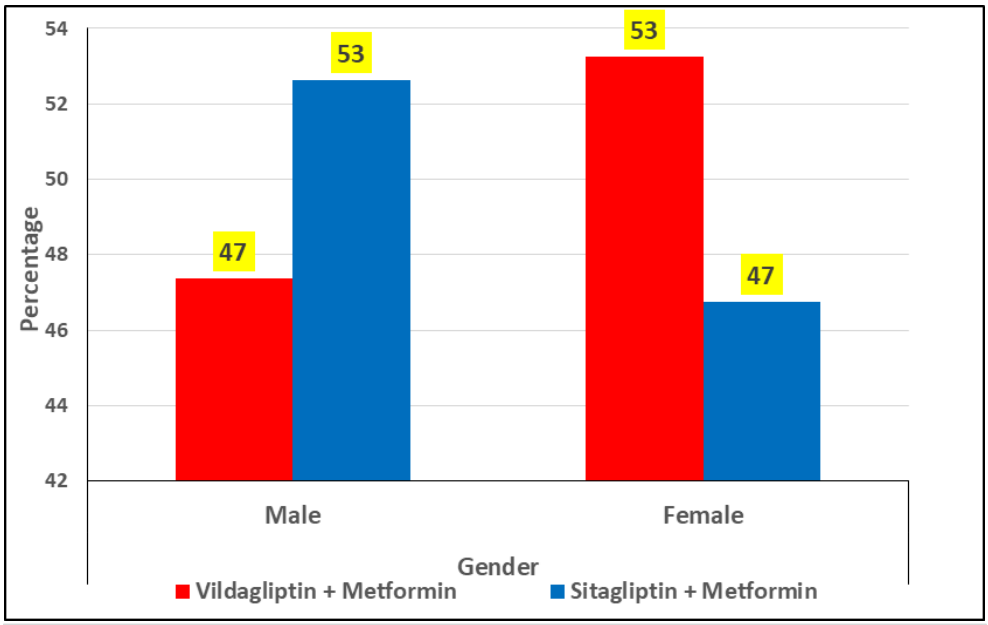


Table 2: Distribution of Gender among 2 treatment groups

		Group				Total		Chi-square	P Value
		Vildagliptin + Metformin		Sitagliptin + Metformin					
		No.	%	No.	%	No.	%		
Gender	**Male**	45	47	50	53	95	55	.588a	0.443
	Female	41	53	36	47	77	45		
Total		86	50	86	50	172	100		

Fig 2: Distribution of Gender among 2 treatment groups

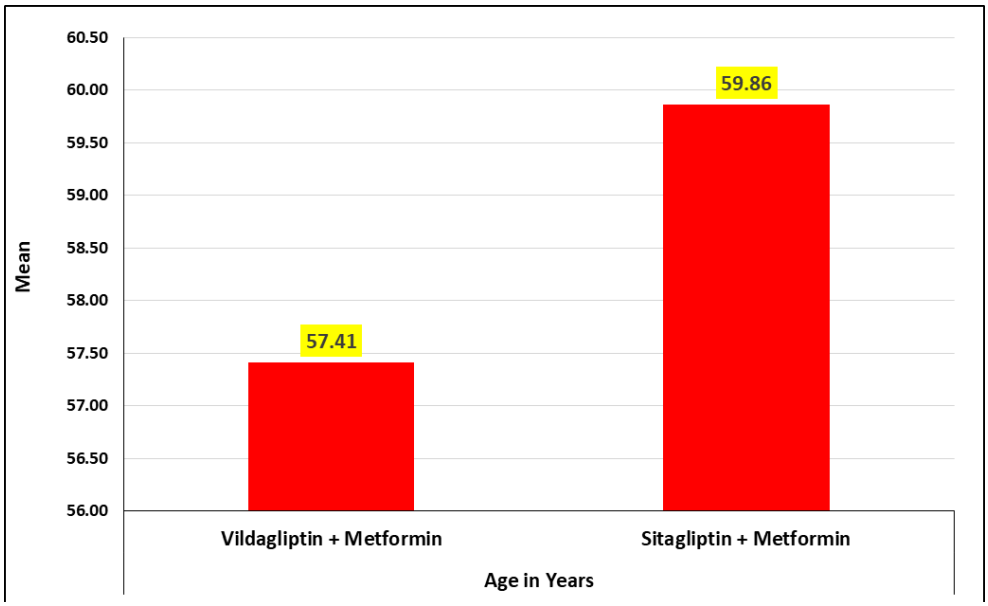


Chi-square=0.588	P = 0.443

Table 3: Distribution of Age among 2 treatment Groups

		N	Mean	Std. Deviation	" t" Value	P Value
Age in Years	**Vildagliptin + Metformin**	86	57.41	12.01409	1.348	0.179
	Sitagliptin + Metformin	86	59.86	11.8512		

Fig 3: Distribution of Age among 2 treatment Groups



Vildagliptin +Metformin-S. D-12.01409	t value - 1.348 P value - 0.179
Sitagliptin Metformin -S. D 11.85120	

Table 4: Glycaemic and Biochemical Outcomes at the Initial Visit

			N	Mean	Std. Deviation	" t" Value	P Value
1st month visit	FBS	Vildagliptin + Metformin	86	146.49	33.208	0.747	0.456
		Sitagliptin + Metformin	86	142.53	36.138		
	PLBS	Vildagliptin + Metformin	86	214.95	43.45	0.959	0.339
		Sitagliptin + Metformin	86	208.01	51.185		
	HbA1c	Vildagliptin + Metformin	86	7.36	0.689	0.331	0.741
		Sitagliptin + Metformin	86	7.4	0.784		
	Cr	Vildagliptin + Metformin	86	1.01	0.276	1.544	0.125
		Sitagliptin + Metformin	86	1.08	0.352		
	TG	Vildagliptin + Metformin	24	189.79	100.992	1.308	0.198
		Sitagliptin + Metformin	22	248.36	192.553		

Fig 4: Glycemic and Biochemical Outcomes at the Initial Visit

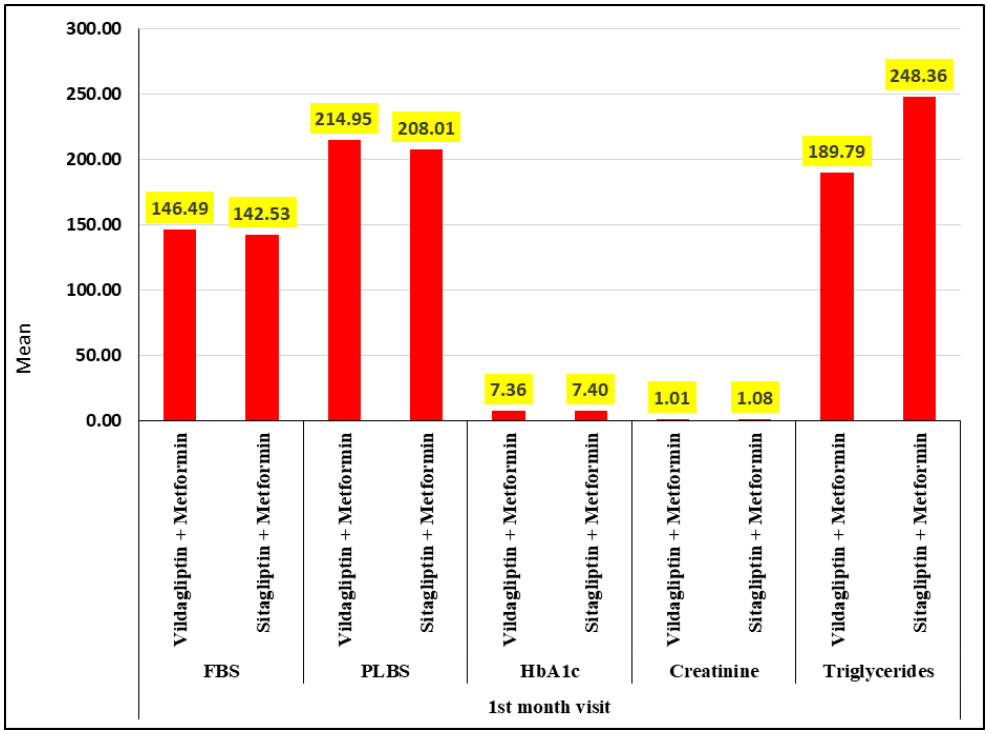


Table 5: Glycaemic and Biochemical Parameters at 1st Follow-Up (3rd Month)

Group			N	Mean	Std. Deviation	"t" Value	P Value
3rd month visit	FBS	Vildagliptin + Metformin	85	131.64	33.388	0.015	0.988
		Sitagliptin + Metformin	86	131.56	36.088		
	PLBS	Vildagliptin + Metformin	85	194.61	43.701	0.287	0.774
		Sitagliptin + Metformin	86	192.57	49.101		
	HbA1c	Vildagliptin + Metformin	85	7.18	0.661	0.901	0.369
		Sitagliptin + Metformin	86	7.28	0.788		
	Cr	Vildagliptin + Metformin	85	0.98	0.25	1.443	0.151
		Sitagliptin + Metformin	86	1.03	0.259		
	TG	Vildagliptin + Metformin	22	162.5	107.909	0.528	0.601
		Sitagliptin + Metformin	22	180.82	121.959		

Fig 5: Glycaemic and Biochemical Parameters at 1st Follow-Up (3rd Month)

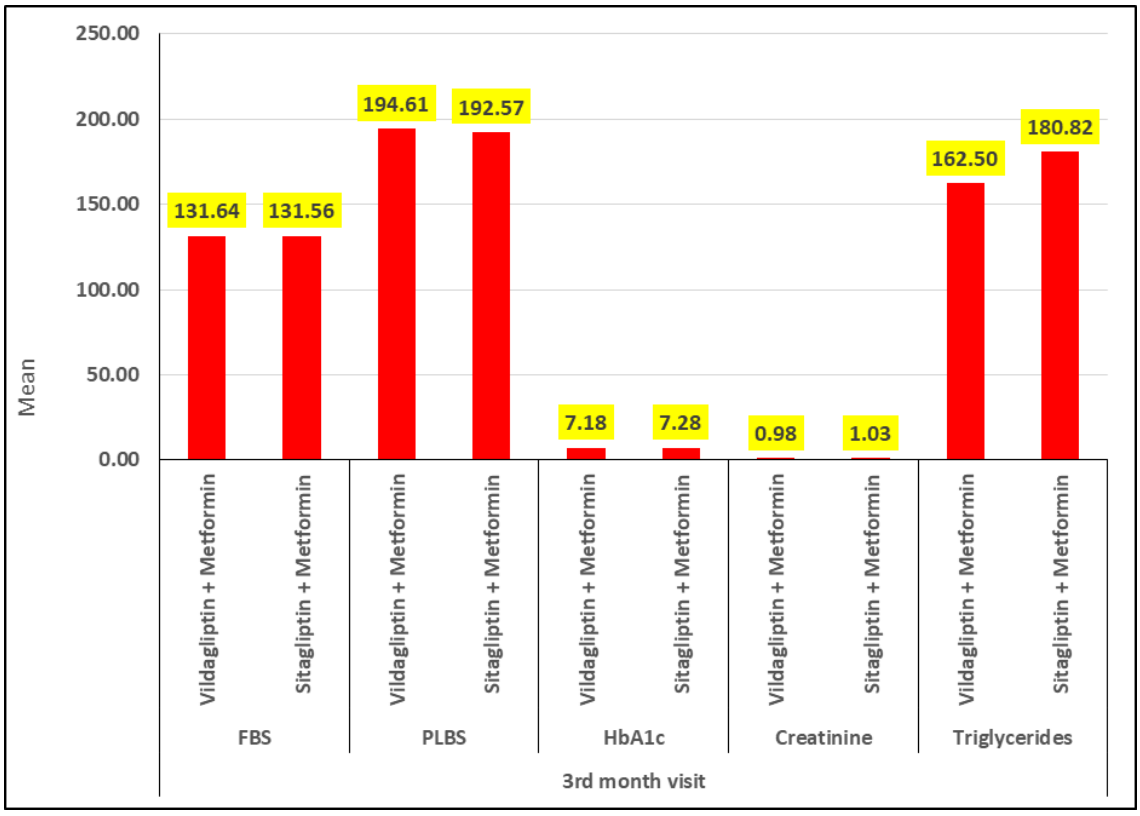


Table 6: Glycaemia and Biochemical Parameters at 2nd Follow-Up (6th Month)

Group			N	Mean	Std. Deviation	" t" Value	P Value
6th month visit	FBS	Vildagliptin + Metformin	50	121.38	33.298	0.767	0.445
		Sitagliptin + Metformin	57	126.16	31.103		
	PLBS	Vildagliptin + Metformin	50	172.76	42.91	0.645	0.521
		Sitagliptin + Metformin	57	178.33	46.054		
	HbA1c	Vildagliptin + Metformin	50	7.01	0.662	1.094	0.276
		Sitagliptin + Metformin	57	7.16	0.775		
	Cr	Vildagliptin + Metformin	50	0.93	0.233	0.007	0.994
		Sitagliptin + Metformin	57	0.93	0.236		
	TG	Vildagliptin + Metformin	14	111.07	61.782	0.037	0.971
		Sitagliptin + Metformin	17	110.35	46.579		

Fig 6: Glycaemic and Biochemical Parameters at 2nd Follow-Up (6th Month)

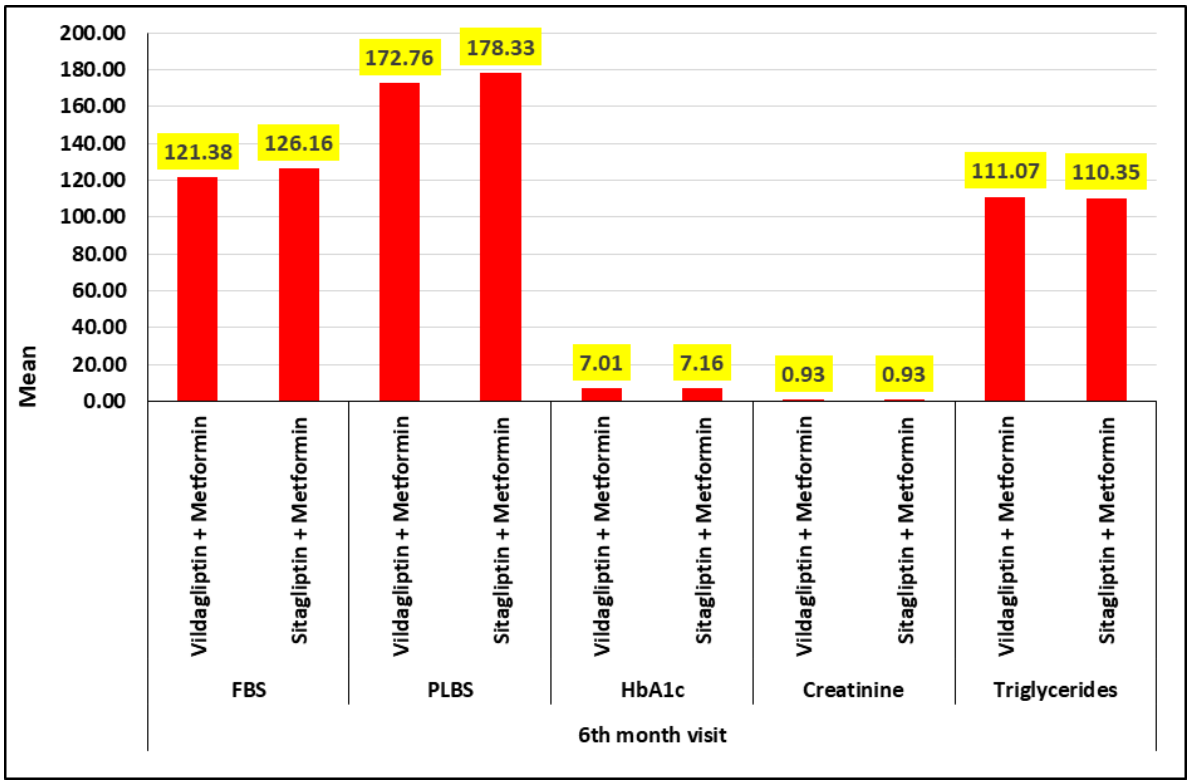


Table 7:Impact of Vildagliptin + Metformin on FBS, PLBS, HbA1c, Creatinine, and Triglyceride Levels over Initial Visit, 3rd and 6th months.

Vildagliptin + Metformin		Mean	N	Std. Deviation	" t" Value	P Value
FBS	Initial Visit	146.31	85	33.361	22.555	**<0.001**
	3rd Month Visit	131.64	85	33.388		
PLBS	Initial Visit	215.42	85	43.487	35.038	**<0.001**
	3rd Month Visit	194.61	85	43.701		
HbA1c	Initial Visit	7.37	85	0.689	25.125	**<0.001**
	3rd Month Visit	7.18	85	0.661		
Cr	Initial Visit	1.01	85	0.278	3.831	**<0.001**
	3rd Month Visit	0.98	85	0.25		
TG	Initial Visit	198.91	22	100.575	5.817	**<0.001**
	3rd Month Visit	162.5	22	107.909		
FBS	3rd Month Visit	133.54	50	34.887	25.836	**<0.001**
	6th Month Visit	121.38	50	33.298		
PLBS	3rd Month Visit	194.44	50	43.074	23.801	**<0.001**
	6th Month Visit	172.76	50	42.91		
HbA1c	3rd Month Visit	7.19	50	0.677	12.86	**<0.001**
	6th Month Visit	7.01	50	0.662		
Cr	3rd Month Visit	0.96	50	0.237	2.178	**0.034**
	6th Month Visit	0.93	50	0.233		
TG	3rd Month Visit	148.46	13	61.424	7.441	**<0.001**
	6th Month Visit	114.62	13	62.806		
FBS	Initial Visit	147.5	50	35.319	44.896	**<0.001**
	6th Month Visit	121.38	50	33.298		
PLBS	Initial Visit	214.44	50	43.149	96.308	**<0.001**
	6th Month Visit	172.76	50	42.91		
HbA1c	Initial Visit	7.38	50	0.702	26.555	**<0.001**
	6th Month Visit	7.01	50	0.662		

Cr	Initial Visit	1	50	0.28	4.384	**0.034**
	6th Month Visit	0.93	50	0.233		
TG	Initial Visit	189	14	70.585	11.951	**<0.001**

Fig 7: Impact of Vildagliptin + Metformin on FBS, PLBS, HbA1c, Creatinine, and Triglyceride Levels over Initial Visit, 3rd and 6th months.

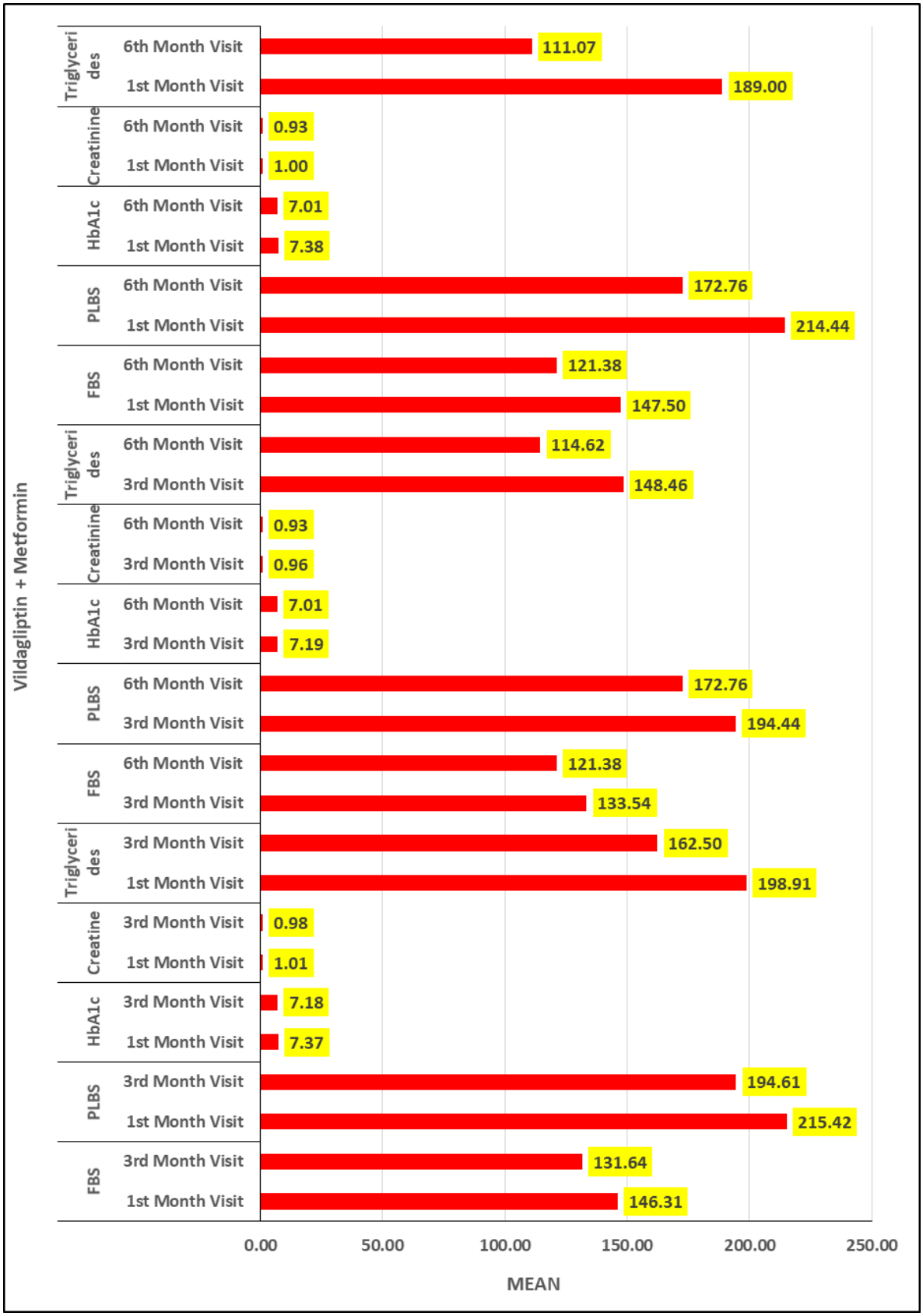
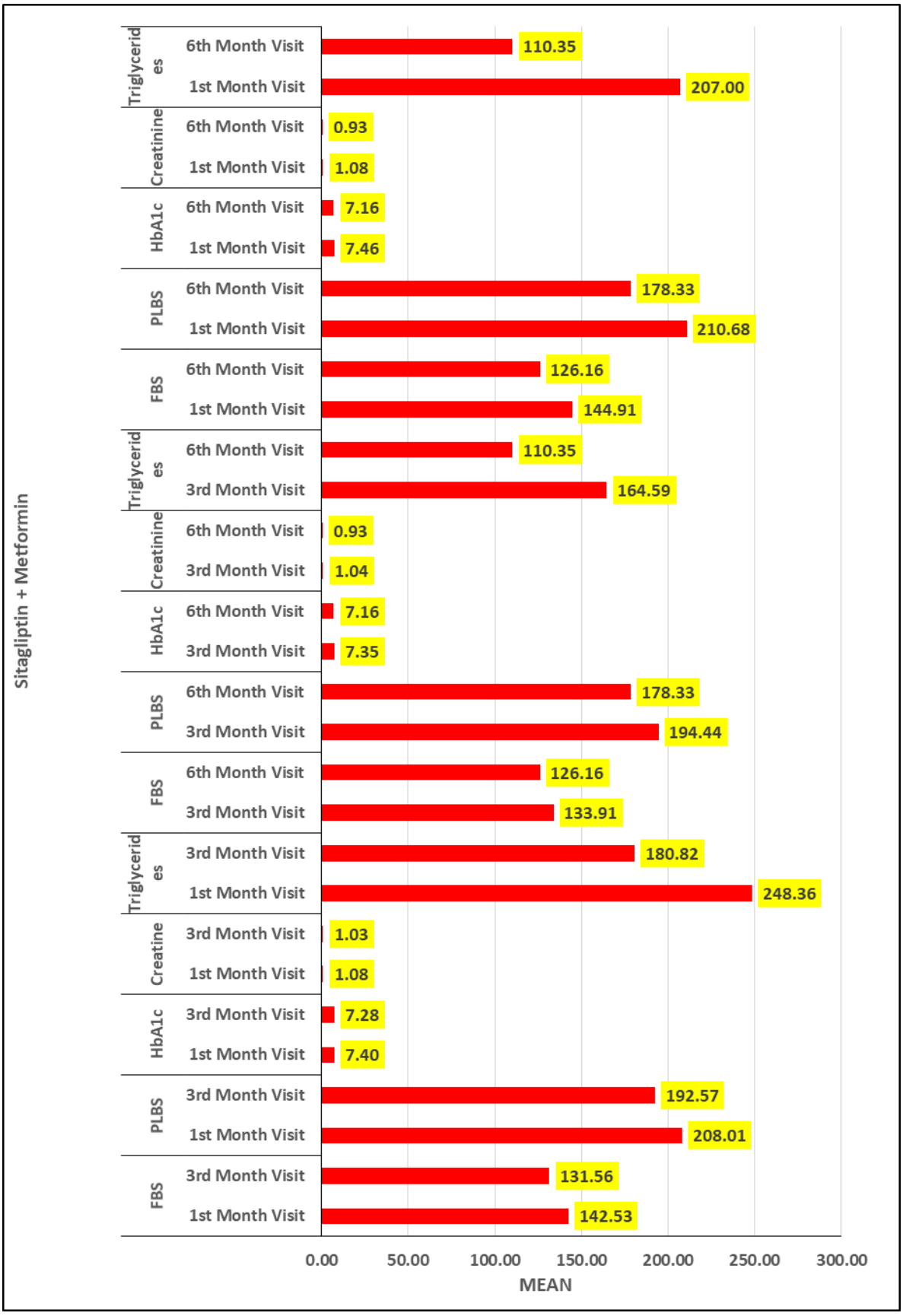


Table 8: Impact of Sitagliptin + Metformin on FBS, PLBS, HbA1c, Creatinine, and Triglyceride Levels over Initial visit, 3rd, and 6th months.

Sitagliptin + Metformin		Mean	N	Std. Deviation	" t" Value	P Value
FBS	Initial Visit	142.53	86	36.138	171.478	**<0.001**
	3rd Month Visit	131.56	86	36.088		
PLBS	Initial Visit	208.01	86	51.185	9.374	**<0.001**
	3rd Month Visit	192.57	86	49.101		
HbA1c	Initial Visit	7.4	86	0.784	18.882	**<0.001**
	3rd Month Visit	7.28	86	0.788		
Cr	Initial Visit	1.08	86	0.352	3.145	**0.002**
	3rd Month Visit	1.03	86	0.259		
TG	Initial Visit	248.36	22	192.553	3.145	**0.005**
	3rd Month Visit	180.82	22	121.959		
FBS	3rd Month Visit	133.91	57	33.454	8.733	**<0.001**
	6th Month Visit	126.16	57	31.103		
PLBS	3rd Month Visit	194.44	57	47.829	8.425	**<0.001**
	6th Month Visit	178.33	57	46.054		
HbA1c	3rd Month Visit	7.35	57	0.833	6.937	**<0.001**
	6th Month Visit	7.16	57	0.775		
Cr	3rd Month Visit	1.04	57	0.276	4.553	**<0.001**
	6th Month Visit	0.93	57	0.236		
TG	3rd Month Visit	164.59	17	118.005	2.45	**0.026**
	6th Month Visit	110.35	17	46.579		
FBS	Initial Visit	144.91	57	33.524	20.899	**<0.001**
	6th Month Visit	126.16	57	31.103		
PLBS	Initial Visit	210.68	57	48.957	28.507	**<0.001**
	6th Month Visit	178.33	57	46.054		
HbA1c	Initial Visit	7.46	57	0.833	10.952	**<0.001**
	6th Month Visit	7.16	57	0.775		

Cr	Initial Visit	1.08	57	0.352	4.742	**<0.001**
	6th Month Visit	0.93	57	0.236		
TG	Initial Visit	207	17	159.171	3.098	**0.007**

Fig 8: Impact of Sitagliptin + Metformin on FBS, PLBS, HbA1c, Creatinine, and Triglyceride Levels over Initial visit, 3rd, and 6th months.



Discussion

The study included a total of 172 participants, with a gender distribution of 55% male (95 participants) and 45% female (77 participants). This distribution is reflective of the general population in diabetes studies, where males often have a higher prevalence of T2DM.

Participants were divided into two treatment groups: Vildagliptin + Metformin and Sitagliptin + Metformin. Both groups showed significant improvements in FBS, PLBS, HbA1c, Cr, TG over the 6-month period.

***Table 2, Fig 2**- represents the distribution of participants in the two treatment groups: Vildagliptin + Metformin and Sitagliptin + Metformin, along with their respective sex breakdowns. Both treatment groups had a similar gender distribution, The Chi-square value of 0.588 and a p-value of 0.443 indicate no significant difference in gender distribution between the two groups.*

***Table 3, Fig 3** the mean age for the Vildagliptin + Metformin group was 57.41 years, while the Sitagliptin + Metformin group had a mean age of 59.86 years. The t-value of 1.348 and p-value of 0.179 suggest no significant difference in age between the two groups.*

*In **Table 4, Fig 4** Initial visit parameters, the Vildagliptin + Metformin group exhibited a FBS of 146.49 mg/dL and a PLBS of 214.95 mg/dL, with an HbA1c of 7.36%, creatinine at 1.01 mg/dL, and TG at 198.91 mg/dL. In comparison, the Sitagliptin + Metformin group had an FBS of 142.53 mg/dL, PLBS of 208.01 mg/dL, HbA1c of 7.40%, Cr at 1.08 mg/dL, and TG at 248.36 mg/dL. These initial values indicate that both groups started with similar metabolic profiles, allowing for a fair comparison of treatment efficacy over time.*

In **Table 5, Fig 5**- By the third month, both treatment groups showed significant improvements in metabolic parameters. This is consistent with recent systematic reviews and network meta-analyses of DPP-4 inhibitors plus metformin [9]. The Vildagliptin + Metformin group recorded an FBS of 131.64 mg/dL (10.14% decrease), PLBS of 194.61 mg/dL (9.48% decrease), HbA1c of 7.18% (2.45% decrease), and Cr at 0.98 mg/dL (2.97% decrease). TG decreased to 162.50 mg/dL (18.25% decrease). The Sitagliptin + Metformin group also improved, with an FBS of 131.56 mg/dL (7.69% decrease), PLBS of 192.57 mg/dL (7.39% decrease), HbA1c of 7.28% (1.62% decrease), Cr at 1.03 mg/dL (4.63% decrease), and TG at 180.82 mg/dL (27.14% decrease). These results indicate effective management of diabetes in both groups. But overall, the Vildagliptin + Metformin group demonstrated superior reductions in FBS, PLBS, and HbA1c.

In **Table 6, Fig 6** - At the sixth-month visit, the Vildagliptin + Metformin group demonstrated further improvements, with an FBS of 121.38 mg/dL (17.14% decrease), PLBS of 172.76 mg/dL (19.59% decrease), HbA1c of 7.01% (4.76% decrease), and stable Cr at 0.93 mg/dL (7.92% decrease). TG were recorded at 111.07 mg/dL (44.04% decrease). The Sitagliptin + Metformin group also showed favourable results, with an FBS of 126.16 mg/dL (11.48% decrease), PLBS of 178.33 mg/dL (14.26% decrease), HbA1c of 7.16% (3.24% decrease), Cr at 0.93 mg/dL (13.89% decrease), and TG at 110.35 mg/dL (55.66% decrease). While both groups showed improvements, the Vildagliptin + Metformin group maintained superior control over FBS, PLBS, HbA1c.

***Table 7, Fig 7** - summarizes the mean values, standard deviations, t-values and p-values for various parameters at different visits for the Vildagliptin + Metformin group. Significant reductions were observed in FBS, PLBS, HbA1c, Cr, and TG, with p-values < 0.001 indicating strong statistical significance. These results underscore the efficacy of Vildagliptin + Metformin in managing diabetes and improving metabolic health, suggesting it may be a preferred treatment option for patients.*

***Table 8, Fig 8**, Similar to Table 7, this table summarizes the results for the Sitagliptin + Metformin group. Significant reductions were also noted across all parameters, with p-values < 0.001 for mostcomparisons. [16] However, the magnitude of improvement was generally less than that observed with Vildagliptin + Metformin.*

This indicates that while Sitagliptin + Metformin is effective, Vildagliptin + Metformin demonstrates superior efficacy in managing key metabolic parameters. [14]

Conclusion

This study evaluated the efficacy of two treatment regimens, Vildagliptin + Metformin and Sitagliptin + Metformin, in managing T2DM over six months.
The results demonstrated that both treatment groups achieved significant improvements in key metabolic parameters: in the vildagliptin + metformin group, mean FBS decreased from 162.4 ± 18.7 mg/dL to 124.8 ± 14.3 mg/dL, PLBS from 238.5 ± 22.1 mg/dL to 178.6 ± 19.4 mg/dL, and HbA1c from 8.4 ± 0.6% to 7.1 ± 0.4%, while the sitagliptin + metformin group improved from 160.9 ± 17.5 mg/dL to 134.2 ± 15.1 mg/dL (FBS), 236.2 ± 21.3 mg/dL to 190.8 ± 20.7 mg/dL (PLBS), and 8.3 ± 0.5% to 7.3 ± 0.4% (HbA1c); the greater reductions observed with vildagliptin + metformin were statistically significant (p < 0.05). Specifically, Vildagliptin + Metformin achieved greater reductions in FBS and PLBS, as well as a more significant decrease in HbA1c, in achieving optimal glycaemic control and improving metabolic health in patients with type 2 diabetes.[12]
Sitagliptin + Metformin demonstrated a modest improvement in triglyceride and serum creatinine levels compared to Vildagliptin Metformin. However, the differences in renal and lipid parameters were minimal and not clinically significant. [13]
Overall, the results support the continued use of both Vildagliptin + Metformin and Sitagliptin + Metformin in clinical practice, with a recommendation for Vildagliptin + Metformin as a preferred choice for enhanced metabolic control. [14,15,17]

Acknowledgments

This dissertation is titled "The Glycaemic Outcomes of Metformin with Add-on Vildagliptin or Sitagliptin in Type 2 Diabetes Mellitus (T2DM)" and has been completed at RVM Hospital and GCPK in Hyderabad. We would like to express our gratitude to all those who supported and guided us throughout the completion of our thesis work. First, we extend our sincere thanks to our college Secretary, Sir G. Ravinder Reddy, for his constant encouragement and support.

We are deeply grateful to our esteemed Principal, Dr. M. Ravi Kumar, M. Pharm, Ph.D., PDF (USA), for his guidance and support during our study. We would also like to express our heartfelt appreciation to our Head of Department, Dr. Abdul Nazer Ali, M. Pharm, Ph.D. (Clinical Pharmacy), Professor and HOD of Pharmacy Practice at GCPK, for his invaluable guidance and consistent support. His wisdom and expertise guided us at every step of our research, helping us overcome challenges and refine our work. We are particularly thankful to our Internal Guide, Dr. Mohammed Abubakar, for his exceptional guidance, encouragement, and motivation. His unwavering support and extensive knowledge were critical in shaping our research, and we are deeply appreciative of his patience and dedication throughout this process.

A special thank you goes to our Clinical Guide, Dr. B. Sashidhar Reddy (MBBS, DNB, MNAMS, INT MED), Associate Professor in the Department of General Medicine at RVM Hospital. His expertise, insightful suggestions, and ongoing support have been indispensable throughout our research journey. We also thank the hospital staff for their cooperation and assistance, as well as the patients who participated in this study. Without them, this research would not have been possible. Their contributions were vital to the success of this project. Finally, we wish to express our thanks to all those who assisted us in various ways during this research, even if we cannot mention every name here. Your encouragement, support, and help have been invaluable, and we will always be grateful. No funding or sponsorship was received for this study or for the publication of this article.[15]

Strengths

The study compares the efficacy and safety of vildagliptin and sitagliptin in conjunction with metformin, providing insights into their therapeutic outcomes. Emphasizing follow-up reminders enhances medication adherence, leading to improved patient outcomes. Furthermore, the study highlights outcomes that matter to patients, such as blood sugar control and potential side effects, offering a clearer understanding of how treatment affects their quality of life.

Limitations

The study may not have fully accounted for variations in lifestyle factors, such as diet and physical activity, which could influence glycaemic outcomes. Conducting the study in a single hospital limits the applicability of the findings to broader populations or different healthcare settings. Additionally, the restrictive inclusion and exclusion criteria, such as excluding patients with alcohol use, may reduce the relevance of the results to typical diabetic populations.

References

1. American Diabetes Association. Diagnosis and Classification of Diabetes Mellitus. Diabetes Care. 2010 Dec 30;34(Suppl 1): S62-9.

2. International Diabetes Federation.IDF Diabetes Atlas, 11th edn. Brussels, Belgium: 2025. Available at: https://diabetesatlas.org

3.Sjöholm Å, Nyström T. Inflammation and the etiology of type 2 diabetes. Diabetes/Metabolism Research and Reviews. 2006;22(1):4-10. Doi:10.1002/dmrr.568

4. Sunena, Mishra DN. Stress Etiology of Type 2 Diabetes. Current Diabetes Reviews. 2022 Feb 24;18(9): e240222201413. Doi:10.2174/1573399818666220224140934

5. Il'yasova D. Oxidative Status in Etiology of Type 2 Diabetes. Austin Journal of Obesity & Metabolic Syndrome. 2015;1(1):1001. https://austinpublishinggroup.com/obesity-metabolic-syndrome/fulltext/ajoms-v1-id1001.pdf

6. Sargis RM. The Hijacking of Cellular Signaling and the Diabetes Epidemic: Mechanisms of Environmental Disruption of Insulin Action and Glucose Homeostasis. Diabetes & Metabolism Journal. 2014;38(1):13-25. Doi:10.4093/dmj.2014.38.1.13.

7 . Kasina SVSK, Baradhi KM. Dipeptidyl Peptidase IV (DPP IV) Inhibitors. [Updated 2023 May 22]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK542331/

8. Biguanides. In: Cleveland Clinic [Internet]. 2023. Available from: https://my.clevelandclinic.org/health/treatments/25004-biguanides.

9. Chen R, Li J, Chen D, Wen W, Zhang S, Li J, et al. Efficacy and Safety of DPP-4 Inhibitors and Metformin Combinations in Type 2 Diabetes: A Systematic Literature Review and Network Meta-Analysis. Diabetes Metab Syndr Obes. 2024 Jun 1;17:2471-93. Doi:10.2147/DMSO.S11193992.

10. Memon N. How Do Antidiabetic Biguanides Dipeptidyl Peptidase-4 Inhibitors Work? Uses, Side Effects, Drug Names. RxList [Internet]. 2021 [cited 2025 Feb 4]. Available from: https://www.rxlist.com/how_do_antidiabetic_biguanides_dipeptidyl_peptidas/drug-class.htm.

11. Green JB, Bethel MA, Armstrong PW, Buse JB, Engel SS, Garg J, Josse R, Kaufman KD, Koglin J, Korn S, Lachin JM, McGuire DK, Pencina MJ, Standl E, Stein PP, Suryawanshi S, Van de Werf F, Peterson ED, Holman RR; TECOS Study Group. Effect of Sitagliptin on Cardiovascular Outcomes in Type 2 Diabetes. N Engl J Med. 2015 Jul 16;373(3):232-42. doi: 10.1056/NEJMoa1501352

12. Lukashevich V, Del Prato S, Araga M, Kothny W. Efficacy and safety of vildagliptin in patients with type 2 diabetes mellitus inadequately controlled with dual combination of metformin and sulfonylurea. Diabetes Obes Metab. 2014 May;16(5):403-9. Doi:10.1111/dom.12157.

13. Odawara M, Hamada I, Suzuki M. Efficacy and Safety of Vildagliptin as Add-on to Metformin in Japanese Patients with Type 2 Diabetes Mellitus. Diabetes Therapy. 2014 Mar;5(1):169-81. Doi:10.1007/s13300-014-0054-x.

14. Han N, Kim MK, Park JH, Kim TK, Rhee BD, Kim TN, et al. Comparative efficacy of vildagliptin and sitagliptin with type 2 diabetes mellitus in real-life clinical practice. Int Congr Diabetes Metab. 2014;(0):178-8.

15.Ji LN, Pan CY, Lu JM, Li H, Li Q, Li QF, et al. Efficacy and safety of combination therapy with vildagliptin and metformin versus metformin up-titration in Chinese patients with type 2 diabetes mellitus: Study design and rationale of the VISION study. Cardiovascular Diabetology. 2013; 12:118. Doi:10.1186/1475-2840-12-118.

16.Guerci B, Monnier L, Serusclat P, Petit C, Valensi P, Huet D, et al. Continuous glucose profiles with vildagliptin versus sitagliptin in add-on to metformin: Results from the randomized OPTIMA study. Diabetes Metab. 2012 Oct;38(4):359-66. Doi: 10.1016/j.diabet.2012.04.007.

17.Signorovitch JE, Wu EQ, Swallow E, Kantor E, Fan L, Gruenberger JB. Comparative Efficacy of Vildagliptin and Sitagliptin in Japanese Patients with Type 2 Diabetes Mellitus. Clinical Drug Investigation. 2011 Sep;31(9):665-74. Doi:10.2165/11590080-000000000-00000.

Ethical approval *was taken from the Institution's Ethical Committee.*

Informed Consent: *The written Informed consent from all the Participants was taken*

Conflict of Interest Statement

The authors declared "No Conflict of Interest" with this publication.

Additional Information

DOI: *https://doi.org/10.62996/daj.61042025*

Cite this Article:

Nallandhigal Harini, Burra Sindu Priya, Yeddanapudi Sree Himaja, Mohammed Abubakar. The Glycemic Outcomes of Metformin with Add-on Vildagliptin or Sitagliptin in T2 Diabetes Mellitus. Diabetes Asia Journal;2(2):86-99. https://doi.org/10.62996/daj.61042025