*International Journal of Health Sciences and Research*
*[Indexed, Peer-Reviewed Journal]*
*Volume 15; Issue: 4; April 2025*
*Website: www.ijhsr.org*
*Original Research Article* *ISSN: 2249-9571*

# Correlation of Lifestyle Changes with Glycemic and Lipid Profile Improvements in 90-Day Retrospective Study

**Dr. Manisha Ghurde[1], Dr. Rajesh Ingole[2], Dr. Prabha Acharya[3]**

[1]Director, VRT's Madhavbaug Institute of Preventive Cardiology, Thane, India.
[2]Senior Consultant Pathologist & Senior Consultant Medical Administration, Dr. Hedgewar Hospital and Research Center, Aurangabad, India.
[3]Mentor, VRT's Madhavbaug Institute of Preventive Cardiology, Thane, India.

Corresponding Author: Dr. Manisha Ghurde

**DOI: https://doi.org/10.52403/ijhsr.20250448**

## ABSTRACT

**Introduction:** Diabetes and triglycerides (TG) are closely linked metabolic parameters, significantly impacted by lifestyle management. This study evaluates the effect of lifestyle modifications on glycemic control and lipid parameters.
**Methods:** A retrospective study was conducted from January 2024 to September 2024, including 201 patients (166 males, 35 females) aged 25–80 years. Inclusion criteria: HbA1c <6, TG <150 mg/dL. Exclusion criteria: HbA1c >6, Type 1 Diabetes Mellitus, and absence of lipid profile. Primary efficacy endpoints: HbA1c and TG levels; secondary endpoints: weight, systolic blood pressure (SBP), diastolic blood pressure (DBP), and random blood sugar (RBS). Data were analyzed using paired t-tests.
**Results:** Significant improvements were observed from Day 1 to Day 90: TG (257.12±117.46 to 246.88±113.98 mg/dL), HbA1c (9.03±2.08 to 8.35±2.13%), weight (79.77±15.61 to 76.97±15.55 kg), SBP (135.41±16.57 to 128.92±16.57 mmHg), DBP (85.55±11.03 to 81.45±10.41 mmHg), and total cholesterol (201.52±46.98 to 198.47±47.70 mg/dL). Medication dependence reduced significantly.
**Conclusion:** Lifestyle modifications positively impact diabetes and triglycerides, reinforcing their co-relation and emphasizing non-pharmacological interventions for better metabolic control.

***Keywords:*** Diabetes, Triglycerides, Lifestyle Management, Blood Pressure

## INTRODUCTION

Diabetes Mellitus (DM) and dyslipidaemia are metabolic disorders that significantly increase the risk of cardiovascular diseases. Elevated triglycerides (TG) and poor glycemic control are commonly observed in individuals with diabetes, contributing to higher morbidity and mortality rates [[1], [2]]. The American Diabetes Association (ADA) and several clinical studies emphasize that lifestyle interventions, including diet modification, regular physical activity, and weight management, play a crucial role in improving these metabolic parameters [[1], [3], [4]].

Insulin resistance, which is commonly associated with type 2 diabetes, leads to abnormalities in lipid metabolism, resulting in elevated TG levels [[5]]. High TG levels are associated with increased very-low-density lipoprotein (VLDL) particles, which further promote the development of atherosclerosis and cardiovascular complications [[6]]. Several large-scale studies, such as the Diabetes Prevention Program (DPP) and Look AHEAD trials, have demonstrated that structured lifestyle interventions can significantly reduce HbA1c and TG levels while improving overall cardiometabolic health [[4], [7], [8]]. Weight loss has been identified as an essential factor in improving insulin sensitivity and reducing TG levels [[9]]. Studies show that even a modest weight reduction of 5–10% can significantly lower TG levels and improve glycemic control [[10], [11]]. Dietary interventions focusing on reduced carbohydrate intake, increased fiber, and omega-3 fatty acids have also been shown to positively impact diabetes and lipid profiles [[12]]. Given this background, the present study aims to evaluate the correlation between diabetes and triglycerides in response to lifestyle interventions and assess the impact of non-pharmacological strategies in improving these parameters.

## MATERIALS & METHODS

This retrospective study was conducted from January 2024 to September 2024, including 201 patients. Data on HbA1c, TG, weight, blood pressure, and lipid profile were analyzed. HbA1c and TG levels. Secondary endpoints: weight, SBP, DBP, RBS. Data were collected at baseline (Day 1) and post-intervention (Day 90).

Paired t-tests were used to analyze changes in metabolic parameters. A p-value <0.05 was considered statistically significant.

## RESULT

A total of 201 patients were included in this study. The mean age of the study population was 48.39±11.07 years and there were 166 (82.59%) males in the study population. TG improved from 257.12±117.46 to 246.88±113.98, p=0.02 and HBA1C 9.03±2.08 to 8.35±2.13, p=0.00 at the 90-day follow-up. Secondary endpoints of weight (day 1: 79.77±15.61 kg and day 90 : 76.97±15.55 kg, p=0.00), ABG (day 1: 102.20±11.78 and day 90: 99.44±12.49, p=0.00), and HR (day 1: 87.36±12.77 and day 90: 83.97±12.77; p=0.02), SBP (day 1: 135.41±16.57 and day 90: 128.92±16.57; p=0.00), DBP (day 1: 85.55±11.03 and day 90: 81.45±10.41; p=0.00), Total Cholesterol (day 1: 201.52±46.98 and day 90: 198.47±47.70; p=0.01) improved at the 90-day follow-up. The demographics of the study population are detailed in Table **1**. Age, Triglycerides and HBA1C wise changes at baseline and 90-day follow-up according to underlying comorbidities of the study population are given in Table **3,4,5**.

**Table 1: Demographics of the study population**

| Variable | Day 1 | Day 90 | p value |
|---|---|---|---|
| Age, years | 53.37±14.17 | | |
| Gender | 45 (86.45%), 7 (13.46%) | | |
| Weight, kg | 75.60±13.64 | 72.78±13.01 | 0.00 |
| Abdominal Girth | 101.02±10.66 | 97.46±9.22 | 0.00 |
| HR | 81.98±12.56 | 77.87±11.46 | 0.03 |
| Total Cholesterol | 199.23±53.29 | 194.92±51.99 | 0.04 |
| TG | 246.56±82.14 | 230.35±90.55 | 0.03 |
| HDL | 41.88±14.44 | 40.96±13.63 | 0.04 |
| LDL | 112.07±48.13 | 109.04±46.30 | 0.03 |

All data are expressed as number (percentage) or mean ± standard deviation.

p value ≤0.05 was considered statistically significant.

TG – Triglycerides, HDL- High-density lipoprotein, LDL- Low-density lipoprotein, HR- Heart Rate

**Table 2: Weight and ABG and Triglycerides changes at baseline and 90-day follow-up according to underlying comorbidities of the study population**

| Diagnosis | Weight Day 1 | Weight Day 90 | Change % | ABG Day 1 | ABG Day 90 | Change % | triglycerides Day 1 | triglycerides Day 90 | Change % |
|---|---|---|---|---|---|---|---|---|---|
| Dyslipidemia (n=11) | 80.36 | 77.45 | -3.62 | 98.91 | 97.73 | -1.19 | 241.27 | 211.16 | -12.36 |
| Diabetes mellitus (n=29) | 74.02 | 70.79 | -4.36 | 102.31 | 97.45 | -4.75 | 254.87 | 251.42 | -1.35 |
| Hypertension (n=24) | 72.94 | 70.71 | -3.07 | 100.17 | 95.79 | -4.37 | 225.60 | 199.26 | -11.67 |
| Obesity (n=14) | 85.04 | 81.04 | -4.71 | 107.36 | 99.00 | -7.78 | 226.06 | 190.70 | -15.64 |
| Ischemic Heart Disease (n=15) | 73.02 | 71.41 | -2.20 | 99.87 | 97.13 | -2.74 | 260.07 | 239.80 | -7.79 |

**Table 3: Demographic and anthropometric measurements according to age of the study population**

| Variables | N | Weight Day 1 | Weight Day 90 | Change % | ABG Day 1 | ABG Day 90 | Change % | triglycerides Day 1 | triglycerides Day 90 | Change % |
|---|---|---|---|---|---|---|---|---|---|---|
| **Age, years** | | | | | | | | | | |
| 30-55 | 24 | 77.57+13.50 | 74.73+12.64 | -3.66 | 98.77+9.82 | 95.31+8.61 | -3.5 | 266.89+89.40 | 260.46+94.04 | -2.41 |
| 56-80 | 22 | 73.62+13.50 | 70.82+13.07 | -3.8 | 103.27+10.98 | 99.62+9.31 | -3.54 | 226.23+68.38 | 200.23+75.78 | -11.49 |

All data are expressed as mean ± standard deviation.

ABG – Abdominal Girth index

**Table 4: Demographic and anthropometric measurements according to BMI of the study population**

| Variables | N | Weight Day 1 | Weight Day 90 | Change % | ABG Day 1 | ABG Day 90 | Change % | Triglycerides Day 1 | Triglycerides Day 90 | Change % |
|---|---|---|---|---|---|---|---|---|---|---|
| Morbid Obesity | 15 | 86.83+12.74 | 82.32+13.98 | -5.19 | 111.07+10.54 | 104.67+10.43 | -5.76 | 212.12+58.43 | 205.46+65.35 | -3.14 |
| Normal Weight | 12 | 60.04+8.56 | 58.98+8.09 | -1.76 | 91.00+7.51 | 90.50+6.60 | -0.55 | 253.92+62.35 | 240.00+72.55 | -5.48 |
| Obess-1 | 19 | 75.06+7.69 | 72.28+7.37 | -3.69 | 98.32+5.68 | 95.68+5.98 | -2.68 | 268.16+97.13 | 237.84+112.17 | -11.31 |
| Obess-2 | 6 | 80.35+7.11 | 78.08+6.09 | -2.83 | 104.50+1.98 | 99.00+5.00 | -5.26 | 249.55+87.95 | 249.55+87.95 | 0.00 |

All data are expressed as mean ± standard deviation.

ABG – Abdominal Girth index

## DISCUSSION

Lifestyle interventions have long been recognized as a cornerstone in managing metabolic disorders, particularly diabetes and dyslipidaemia [[1,4,7]]. Several studies, including the Diabetes Prevention Program (DPP) and Look AHEAD trials, have provided strong evidence that structured lifestyle interventions, such as dietary changes, increased physical activity, and weight loss, result in significant improvements in metabolic parameters [[4,7,8]]. The results of this study reinforce these findings, demonstrating significant reductions in HbA1c and TG levels over 90 days. Additionally, reductions in systolic and diastolic blood pressure, weight, and total cholesterol further support the effectiveness of lifestyle modifications [[6,9,10]].

Prior research has shown that insulin resistance plays a crucial role in elevating triglyceride levels and impairing glucose metabolism [[2,3,6]]. Lifestyle interventions, by improving insulin sensitivity, contribute to better glucose and lipid control [[5,9]]. Moreover, physical activity has been shown to enhance lipid metabolism, promoting the breakdown of triglycerides and reducing cardiovascular risk [[8,11,12]]. The reduction in medication dependence observed in this study also highlights the potential of non-pharmacological interventions in diabetes management [[10]].

This underscores the importance of patient education and adherence to lifestyle modifications as a primary strategy for managing metabolic disorders. While pharmacological treatments remain essential for many individuals, integrating lifestyle modifications can lead to improved long-term health outcomes and reduced healthcare costs [[5,7,12]]. Future studies should explore longer-term effects and potential genetic and behavioural influences on response to lifestyle interventions.

## CONCLUSION

This study demonstrates that lifestyle modifications improve glycemic control and lipid profiles, reducing dependence on pharmacological treatment.

### *Declaration by Authors*

**Acknowledgement:** Miss Pallavi Mohe from the Research Department of Madhavbaug Cardiac Clinics took an all efforts for data collection and data analysis.

**Source of Funding:** None

**Conflict of Interest:** The authors declare no conflict of interest.

## REFERENCES

1. American Diabetes Association. Standards of Medical Care in Diabetes—2024. Diabetes Care. 2024;47(Suppl 1):S1-S300.
2. Reaven GM. Role of insulin resistance in human disease. Diabetes. 1988;37(12):1595-607.
3. Grundy SM. Hypertriglyceridemia, insulin resistance, and the metabolic syndrome. Am J Cardiol. 1999;83(9B):25F-29F.
4. Knowler WC, Barrett-Connor E, Fowler SE, Hamman RF, Lachin JM, Walker EA, et al. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med. 2002;346(6):393-403.
5. Look AHEAD Research Group. Long-term effects of a lifestyle intervention on weight and cardiovascular risk factors in individuals with type 2 diabetes mellitus: four-year results of the Look AHEAD trial. Arch Intern Med. 2010;170(17):1566-75.
6. Haffner SM, Mykkänen L, Festa A, Burke JP, Stern MP. Insulin-resistant prediabetic subjects have more atherogenic risk factors than insulin-sensitive prediabetic subjects: implications for preventing coronary heart disease during the prediabetic state. Circulation. 2000;101(9):975-80.
7. Tuomilehto J, Lindström J, Eriksson JG, Valle TT, Hämäläinen H, Ilanne-Parikka P, et al. Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. N Engl J Med. 2001;344(18):1343-50.
8. Mozaffarian D, Kamineni A, Carnethon M, Djoussé L, Mukamal KJ, Siscovick D. Lifestyle risk factors and new-onset diabetes

mellitus in older adults: the Cardiovascular Health Study. Arch Intern Med. 2009;169(8):798-807.
9. Manson JE, Skerrett PJ, Greenland P, VanItallie TB. The escalating pandemics of obesity and sedentary lifestyle. A call to action for clinicians. Arch Intern Med. 2004;164(3):249-58.
10. Hu FB, Manson JE, Stampfer MJ, Colditz G, Liu S, Solomon CG, et al. Diet, lifestyle, and the risk of type 2 diabetes mellitus in women. N Engl J Med. 2001;345(11):790-7.
11. Eckel RH, Jakicic JM, Ard JD, De Jesus JM, Houston Miller N, Hubbard VS, et al. 2013 AHA/ACC guideline on lifestyle management to reduce cardiovascular risk. J Am Coll Cardiol. 2014;63(25 Pt B):2960-84.
12. Jenkins DJ, Kendall CW, Axelsen M, Augustin LS, Vuksan V. Viscous dietary fiber reduces postprandial blood glucose and insulin in patients with diabetes. Am J Clin Nutr. 2000;71(2):401-7.

How to cite this article: Manisha Ghurde, Rajesh Ingole, Prabha Acharya. Correlation of lifestyle changes with glycemic and lipid profile improvements in 90-day retrospective study. *Int J Health Sci Res.* 2025; 15(4):344-348. DOI: *https://doi.org/10.52403/ijhsr.20250448*

******