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Evaluating the Effects of a 1000kcal Low Carbohydrate Diet and Panchakarma on Cardiovascular Risk Factors in Hypertriglyceridemia

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ABSTRACT

Background: Elevated triglyceride (TG) levels are a significant risk factor for cardiovascular disease. This retrospective study investigates the impact of a 1000kcal/day low-carbohydrate diet, combined with Panchakarma, on TG levels in individuals with hypertriglyceridemia. Purpose: To evaluate the effectiveness of a 12-week intervention combining a 1000kcal/day low-carbohydrate diet and Panchakarma therapy in reducing triglyceride (TG) levels and improving other cardiometabolic parameters with hypertriglyceridemia.

Methods: A retrospective, Multicentric, observational study was conducted from January 2024 to September 2024. A total of 52 patients aged 30-80 years with TG levels >150mg/dL and followed a 1000kcal low-carbohydrate diet for 12 weeks, with Panchakarma were included in this study. The primary endpoint was improvement in Cholesterol Levels from baseline to the 90-day follow-up. Secondary endpoints were improvement in weight, ABG (Abdominal Girth), Heart Rate and reduction in dependency on allopathic medication from baseline to the 90-day follow-up.

Results: Mean age of the study was 53.37±14.17 years. Primary finding (Mean ± SD, Baseline Vs. 90-days): TG improved from 246.56±82.14 to 230.35±90.55, p=0.0 at the 90-day follow-up. Secondary endpoints of Weight (day 1: 75.60±13.64% and day 90: 72.78±13.01%, p=0.00), ABG (day 1: 101.02±10.66 and day 90: 97.46±9.22, p=0.00), Heart Rate (day 1: 81.98±12.56 and day 90: 77.87±11.46, p=0.03), and BMI parameters also improved at the 90-day follow-up. Reduction in allopathic medication doses was also observed.

Conclusions: A 12-week intervention with a 1000kcal/day low-carbohydrate diet and Panchakarma displayed positive impact on reduced TG levels and various health parameters.

Keywords: Hypertriglyceridemia, Low-Carbohydrate Diet, Triglycerides, Panchakarma, Ayurveda

1.0 INTRODUCTION

Lipid metabolism is regulated by complex interactions between hormonal, genetic, and dietary factors [1,3]. Hypertriglyceridemia, characterized by elevated triglyceride levels in the blood, is a significant risk factor for

cardiovascular disease [2]. Given the increasing global burden of cardiovascular disorders, there is a growing interest in dietary and alternative therapeutic approaches to manage lipid imbalances. One such dietary intervention is a low-carbohydrate diet, which has been shown to influence lipid metabolism and cardiovascular risk factors [5,6,7]. Simultaneously, Ayurvedic therapies such as Panchakarma have been explored for their potential in regulating lipid profiles [4,9]. Additionally, findings suggest that Panchakarma therapy may exert beneficial effects on lipid metabolism through detoxification and metabolic regulation mechanisms [9].

Previous research has demonstrated that low-carbohydrate diets can improve lipid profiles by reducing triglycerides and increasing high-density lipoprotein (HDL) cholesterol [10]. Despite the established benefits of these interventions individually, the potential synergistic effect of a 1000 kcal low-carbohydrate diet in conjunction with Panchakarma on cardiovascular risk factors in individuals with hypertriglyceridemia remains underexplored. Dietary guidelines for cardiovascular disease prevention continue to evolve, with various organizations providing differing recommendations on carbohydrate intake and dietary fat composition [11]. However, there is a need for more targeted research that integrates both conventional dietary interventions and alternative medical therapies to optimize cardiovascular health outcomes.

This study aims to evaluate the combined effects of a 1000 kcal low-carbohydrate diet and Panchakarma therapy on lipid metabolism and cardiovascular risk factors in individuals with hypertriglyceridemia. Ayurveda is a traditional medicine system used to treat a range of disease [4]. Panchakarma, an ancient Ayurvedic therapeutic approach, is being explored as a potential adjunct treatment for IHD [9]. Madhavbaug's non-invasive heart treatment also included different types of therapies such as an ischemia reversal program (IRP). The Ischemia Reversal Program (IRP) integrates Panchakarma and allied therapy. It consists of 3 steps: Swedana, Snehana, and Basti [9]. This holistic method involves detoxification procedures such as Swedana, Snehana, and Basti to eliminate toxins and restore balance in the body, with the aim of addressing underlying factors contributing to cardiovascular issues. Daily intake of 1000Kcal diet was made such that the patient would be calorie deficit and, ultimately to meet the normal requirement of 1500 Kcal/ day, body fats would be utilized leading to a reduction in visceral obesity [8]. This study retrospectively investigates the impact of a 1000kcal/day low-carbohydrate diet combined with Panchakarma on TG levels and other metabolic parameters in individuals with hypertriglyceridemia.

2.0 MATERIALS AND METHODS

2.1 Study design & patient population

This retrospective study was conducted from January 2024 to September 2024. A total of 42 patients (30-80 years old) were included TG level >150 mg/dL, adherence to a 1000 kcal/day low-carbohydrate diet were included in this study. Patients with No adherence to the diet plan, TG level <150 mg/dL and incomplete treatment of 90 days were not included in this study. All patients provided written informed consent.

2.2 Ischemia Reversal Program

The study population were given a total of 14 Panchakarma treatments twice a day for the period of 7 days. The Panchakarma treatment consisted of 3 steps: centripetal oleation, thermal vasodilation and per rectal herbal decoction administration details of which is mentioned in previous published papers [3]. Centripetal oleation helps to improve cardiac output and vasodilation and reduces inflammation and causes the loss of excessive salts and water by sweating and per rectal herbal decoction administration reduces lipid, water overload and oxidative stress of the body. The study population

were prescribed with Tab GHA 2tb twice a day (BD) before meal and ARJ Kadha 10 ml BD post meal for 30 days. GHA is a combination of *Tribulus terrestris*, *Curuma longa*, *Phyllanthus emblica* and ARJ is a combination of *Terminalia arjuna*, *Boerhavia Diffusa*, and *Acorus calamus*. They were also advised a calorie-controlled diet for 90 days. The daily calorie intake of the study patients was 1000 calories daily.

2.3 Study endpoints and data collection

The primary efficacy endpoints of this study were the change in TG levels following the 12-week intervention. Secondary endpoints included changes in weight, Abdominal Girth (ABG), heart rate (HR), total cholesterol, HDL, and LDL levels. Data were collected at baseline (Day 1) and after 90 days of intervention.

Data for patient demographics, anthropometrics, echocardiographic findings, and medications were collected and analysed from patient medical records. On day 1 of the IRP, a detailed patient history, anthropometric measurements, and cholesterol measurements were documented. Details of medication was also recorded. This activity was repeated on day 90 of the program. Data of day 1 was compared with data of day 90. Data of only those patients who had completed a total of 14 sessions was collected and analysed.

2.4 STATISTICAL ANALYSIS

Data were analyzed using descriptive statistics (means and standard deviations). t-test was performed to evaluate the statistical significance of changes observed in the parameters between Day 1 and Day 90. Statistical significance was set at $p<0.05$.

3.0 RESULTS

3.1 Demographics of study patients

A total of 52 patients were included in this study. The mean age of the study population was 53.37±14.17 years and there were 45 (86.54%) males and 7 (13.46%) females in the study population. Weight (day 1: 75.60±13.64 kg and day 90: 72.78±13.01 kg; p=0.00), Abdominal Girth (ABG) (day 1: 101.02±10.66 and day 90: 97.46±9.22, p=0.00, HR (day 1: 81.98±12.56 and day 90: 77.87±11.46 p=0.03), and Total Cholesterol (day 1: 199.23±53.29 and day 90: 194.92±51.99, p=0.00), and TG (day 1: 246.56±82.14 and day 90: 230.35±90.55, p=0.00), and HDL (day 1: 41.88±14.44 and day 90: 40.96±13.63, p=0.00), and LDL (day 1: 112.07±48.13 and day 90: 109.04±46.30, p=0.01) improved at the 90-day follow-up. The demographics of the study population are detailed in Table 1.

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

3.2 Demographic and anthropometric measurements according to age and BMI of the study population

Weight improved for the of 30-55 year age group (day 1: 77.57+13.50 kg and day 90: 74.73+12.64 kg, change: -3.66%), 56-80 year age group (day 1: 73.62+13.50 kg and 70.82+13.07 kg, change: -3.80%). ABG improved for the of 30-55 year age group (day 1: 98.77+9.82 and day 90: 95.31+8.61, change: -3.50%), 56-80 year age group (day 1: 103.27+10.98 and day 90: 99.62+9.31, change: -3.54%). Triglyceride improved for the of 30-55 year age group (day 1: 266.89+89.40 and day 90: 260.46+94.04, change: -2.41%), 56-80 year age group (day 1: 226.23+68.38 and 200.23+75.78, change: -11.49%). The demographic and anthropometric measurements according to age at baseline and the 90-day follow-up are demonstrated in Table 3. Similarly, the demographic and anthropometric measurements according to BMI at baseline and the 90-day follow-up are displayed in Tables 4.

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

4.0 DISCUSSION

This retrospective study demonstrates that a 12-week intervention with a 1000kcal/day low-carbohydrate diet combined with Panchakarma led to a significant reduction in TG levels, along with improvements in weight, BMI, ABG, and HR in individuals with hypertriglyceridemia. The reduction in TG levels aligns with findings from other studies that have shown the effectiveness of low-carbohydrate diets in decreasing TG concentrations. These improvements are likely attributed to a combination of factors, including reduced carbohydrate intake that directly influence hepatic TG synthesis and a calorie deficit from the 1000kcal/day plan. The simultaneous reduction in weight, BMI, ABG, and HR further supports the positive impact of this integrated intervention. It is noteworthy that there were no statistically significant changes observed in total cholesterol, LDL, and HDL levels, which may require longer-term studies to investigate. Panchakarma, an Ayurvedic detoxification method, has been theorized to improve metabolic processes and contribute to the observed improvements, although the precise mechanism needs further research. Future randomized controlled trials are necessary to confirm these findings and establish a more definitive link between the intervention and changes in the lipid profile. Furthermore, the study population was predominantly male, so we must be cautious in generalizing the results to a more diverse population.

5.0 CONCLUSION

A 12-week intervention involving a 1000kcal/day low-carbohydrate diet and Panchakarma may have led to reduced TG levels in individuals with hypertriglyceridemia. This intervention may also have other cardiometabolic benefits. Further well-controlled studies with a more diverse population and longer follow-up periods are needed to validate these findings.

Declaration by Authors

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