



## **Impact of Panchakarma Therapy and Diet Modification on Lipid Level on known Dyslipidemia Patients**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. Author RS conception, design and critical analysis of the study. Authors RM, GA and PG materials, data collection, analysis and interpretation of the study results, literature review and writing guidance of this manuscript. All authors read and approved the final manuscript.*

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### **ABSTRACT**

**Aim:** To study the impact of panchakarma treatment and diet modification on the reduction of lipid levels in known dyslipidemia patients.

**Study Design:** Single-arm pilot study

**Place and Duration of the Study:** 50 centres of Madhavbaug clinic, Maharashtra, India, between March 2020 to September 2020.

**Methodology:** We included 35 known coronary artery disease patients (mean age 56.55±10.20 years) of which 74.29% were males and 25.71% were females that had a total cholesterol count of more than 200mg/dL. The study therapy viz. Ischemia Reversal Therapy included: herbal detoxification (minimum 14 sittings of 90 minute each) and the diet prescribed was low calorie : <800. The study time points were baseline and 90 days post treatment. The patients were

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screened for reduction in total cholesterol, low density lipids and weight and an increase in high density lipids.

**Results:** Primary finding (Mean±SD, Baseline Vs. 90-days): reduced Low Density Lipoproteins (LDL) ( $142.37\pm 42.33$  Vs.  $106.42\pm 37.60$ ,  $p=0.0001$ ) and Total Cholesterol ( $240.88\pm 52.30$  Vs.  $174.91\pm 39.61$ ,  $p=0.001$ ) levels while secondary findings (Mean±SD, Baseline Vs. 90-days): marginal increase HDL-C ( $41.66\pm 11.77$  Vs.  $42.8\pm 9.49$ ,  $p=0.67$ ) and reduction in weight ( $66.35\pm 13.15$  Vs.  $62.3\pm 11.78$ ,  $p=0.19$ ). Reduced dependency on statins by 83.33% post treatment whilst maintaining TC levels within normal range.

**Conclusion:** This Study results highlight the benefits of herbal detoxification therapy and diet modification to treat Dyslipidemia thereby reducing the dependency on statin therapy.

**Keywords:** *Dyslipidemia; Ischemic reversal programme; natural detoxification; low calorie diet; total cholesterol; lipid profile.*

## 1. INTRODUCTION

The term dyslipidemia is used to address any abnormal changes in the lipid profile. These changes may be seen in the high density lipoprotein (HDL), low density lipoprotein (LDL) or very low density lipoprotein (VLDL) cholesterol and triglyceride levels. Dyslipidemia is a metabolic disorder and can be predicted by checking the patient's lipid profile. It is closely associated to type 2 diabetes mellitus (DM) with over 70% patients showing at least one type of dyslipidemia. Along with glucose regulation, insulin is responsible in regulating the enzymatic activity of proteins involved with breakdown of cholesterol. Thus, insulin deficiency leads to development of dyslipidemia. Dyslipidemia does not have any specific symptoms of its own but it is manifested due to other underlying conditions[1].

Dyslipidemia may be a result of other underlying issues like Hypothyroidism, chronic kidney disease and obesity. These are the secondary causes of dyslipidemia[2].

The association between an individual's weight/body mass index (BMI) and dyslipidemia has also been demonstrated in a study conducted on obese Americans with BMI greater than 30[3]. Obesity is the root cause of many lifestyle diseases. The presence of excessive fats in the form of cholesterol leads to metabolic burden on the body.

Presence of excessive LDL cholesterol in the blood can lead to arteriosclerotic conditions due to the deposition of cholesterol in the coronary arteries leading to cardiovascular diseases (CVD). A proper balance between the LDL cholesterol and HDL cholesterol needs to be

maintained in order to treat dyslipidemia and CVD[4].

Statins are generally used to treat diseases like dyslipidemia and coronary heart disease (CHD) which are a result of increased cholesterol levels in the plasma. Statins lowers the plasma LDL cholesterol levels by inhibiting the synthesis of cholesterol in the liver which leads to the utilization of LDL cholesterol from the plasma [5].

Statins have an adverse effect on the muscles causing pain, cramps or stiffness[6]. The use of statin has some side effects on the body and there is a need to use alternative methods for the treatment of dyslipidemia.

Our study uses the methods of Ayurveda, like herbal detoxification and low calorie diet, to control the weight, BMI and cholesterol levels, thus reversing the effects of dyslipidemia.

## 2. MATERIALS AND METHODS

### 2.1 Study Population

The study was carried on known coronary artery disease (CAD) patients with TC more than 200 mg/dL from multiple centres of Madhavbaug between March 2020 and September 2020. CAD patients showing normal lipid levels at the start of the study were excluded. A written consent was obtained from all the patients that were selected for the study.

### 2.2 Study Evaluation

The study was conducted for a period of 90 days in which the patients were primarily screened for a reduction in TC and LDL levels and secondarily for an increase in HDL levels and a reduction in weight.

### 2.2.1 Anthropometric measurements

On admission, the weight, abdominal girth (ABG), BMI and blood pressure (BP) was measured at the start and the end of the study period.

### 2.2.2 Lipid profile

The patient's lipid profile was tested to measure TC, total triglycerides (TG), LDL and HDL levels at the start and the end (90 days) of the treatment.

### 2.3 Study Therapy

Thirty five patients with TC >200 selected and were given Ischemic Reversal Program consisting of herbal detoxification (minimum 14 sittings of 90 minute each) and the diet prescribed was low calorie : <800 for a period of 90 days.

Herbal detoxification is done in 3 steps:

1. Centripetal oleation ( Snehana)
2. Thermal Vasodialtion (Swedana)
3. Per rectal herb decoction administration (Basti)

Centripetal oleation is a massage done using sesame oil with essence of lavender oil. This step helps to improve the blood circulation, reduce heart rate and blood pressure.

Thermal vasodialation uses steam formed by boiling a decoction containing dashmool. This helps to eliminate excess salt, water and dilate the blood vessels.

Per rectal herb decoction administration uses Gokshura-Haridra-Amalaki decoction that is administered through the rectum using an enema can and rubber catheter. This step helps to eliminate the toxins from the body.

### 2.4 Statistical Analysis

Assessment of the primary and secondary endpoints was carried by paired t-test with  $p < 0.05$  considered as statistically significant.

The mean, standard deviation and count was calculated in order to interpret the data.

Anovasingle factor data analysis tool was used to statistically analyse the data of the study group at the baseline and 90 days period.

## 3. RESULTS AND DISCUSSION

### 3.1 Study Population and Design

A multicentre, single arm, observational type study was carried out on patients with a known case of CAD.

Screening of 56 patients from 50 centres of Madhavbaug clinic was done based on the TC levels and those with TC level of more than 200mg/dL were selected for the study. After screening, 35 patients (mean age  $56.55 \pm 10.20$  years) were selected of which 74.29% were males and 25.71% were females.

Out of the 35 patients, 15 (42.85%) had a known case of DM and were monitored for HbA1c levels.

### 3.2 Study Therapy

The selected participants were subjected to a low calorie diet and a minimum of 14 sittings of herbal detoxification as a treatment for abnormal lipid profile. Herbal detoxification helps to clean the body of disease causing impurities and imparts a relaxation effect [7]. The cleansing is done at cellular level and total body level that includes the cardiovascular, gastrointestinal tract etc [8].

Previous studies have shown that a low calorie diet focuses on reducing the TC and LDL levels than on increasing the HDL levels. Improvement in the HDL levels is majorly attributed to aerobic exercises according to Varady KA et al.[9].

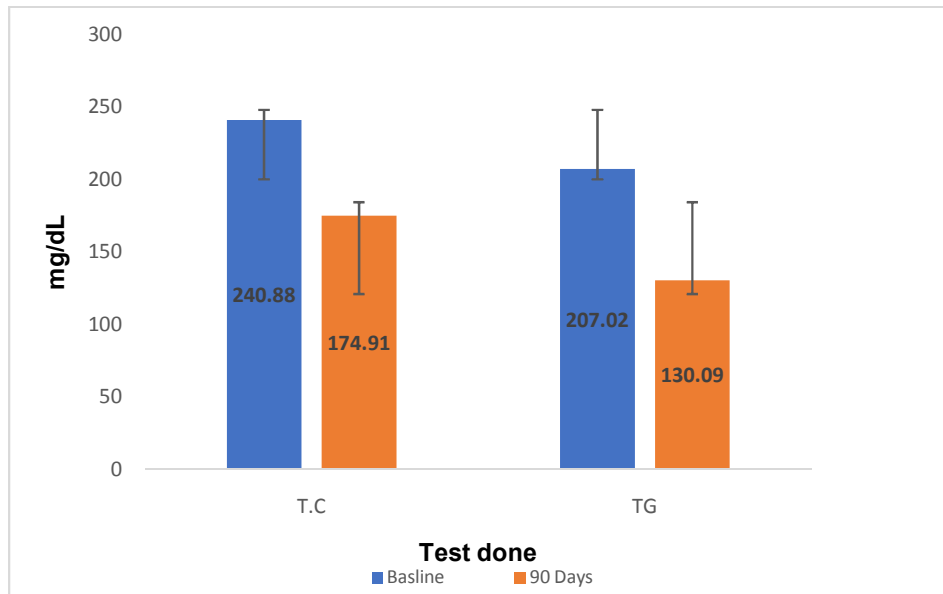
### 3.3 Anthropometric Measurements

The weight, BMI, ABG and BP were monitored at the start of the study and after 90 days of treatment (Table 1). The study showed that there was an effect of herbal detoxification along with a low calorie/high ORAC value diet on reduction of weight, BMI and ABG within a span of 90 days thus normalising the lipid profile of dyslipidemia patients. The results obtained is analogous with previous studies done with panchkarma and a low calorie diet that addresses the BMI reduction in obese patients [10,11].

**Table 1. Comparison between the weight, body mass index, abdominal girth and blood pressure at baseline and after 90 days of treatment**

Test	Baseline	After 90 days	P-value
Weight	66.35 ± 13.15 kgs	62.3 ± 11.78 kgs	0.19
BMI	25.42 ± 4.78 kg/m <sup>2</sup>	23.62± 4.14 kg/m <sup>2</sup>	0.11
ABG	88.97 ± 17.73 cm	83.68 ± 15.62 cm	0.20
SBP	125.37 ± 15.70 mmHg	123.68 ± 13.75 mmHg	0.50
DBP	76.68 ± 11.56 mmHg	73.5 ± 6.97 mmHg	0.31

*Index: BMI- Body mass index, ABG- Abdominal girth, SBP- Systolic blood pressure, DBP- Diastolic blood pressure.*



**Fig. 1. Comparison of Total cholesterol (TC) and Triglycerides (TG) at baseline and after 90 days of treatment**

*Mean±SD (standard deviation) values are used to plot the graphs.*

### 3.4 Lipid Profile

The primary target was to reduce the TC and LDL levels and secondarily to increase the HDL levels with a reduction in the weight of the patients. The desired levels of cholesterol are up to 200mg/dl, of LDL cholesterol is 100mg/dl and HDL cholesterol should not be less than 50 mg/dl. [4].The 90 days treatment helped to achieve the levels closer to the desired level of TC, LDL and HDL.

For the prevention of CHD, a ratio of TC to HDL should be maintained less than 3.5. [12].The diet and herbal detoxification administered helped to reduce this ratio from 5.78 to 4.08 thus, helping to reach closer to the ideal ratio.

The prescribed diet is rich in anti-oxidant and anti-inflammatory properties thus helping to lower

the LDL and TC levels and increase HDL levels. Sharma et al. [13] suggested that ancient vegan tribal diet containing low fat can help to treat dyslipidemia.

Herbal detoxification is beneficial in eliminating toxins from the body through the alimentary canal. This observation is supported by a previous study done on 30 patients with hyperlipidaemia [14]. The use of Panchakarma techniques like centripetal oleation and thermal vasodilation resulted in the reduction of lipid levels and an increase in the HDL levels. Our study presented the combined effect of the low calorie diet and herbal detoxification in treating dyslipidemia in the study population. The results observed cannot be completely attributed to either a low calorie diet or herbal detoxification as our study did not consider a control group in

which participants were treated only with herbal detoxification.



**Fig. 2. Comparison of High density lipoprotein (HDL) and Low density lipoprotein (LDL) at baseline and after 90 days of treatment.**

*Mean±SD (standard deviation) values are used to plot the graphs*

**Table 2. Reduction in medicine uptake at day 90 post treatment**

Medicine uptake			
Type	Count at Baseline	Count at Day 90	Medicine Reduction %
Biguanide	8	2	75
Sulfonylurea	9	2	77.77
Aspirin (NSAID)	14	10	28.57
Statin	18	3	83.33
ACE Inhibitor	4	1	75
ARB	7	5	28.57
Beta Blocker	18	7	61.11
Antiplatelet	21	11	47.62

*Values denote the number of patients taking the medicine at baseline and day 90.*

### 3.5 HbA1c Analysis

Along with dyslipidemia, 15 patients were suffering from DM and had an average HbA1c value of 9.01±2.47 % which reduced to 6.58±1.11% (P- value of 0.00). The American

diabetes association states that HbA1c levels should be below 6.5 % to be considered non-diabetic [15]. The treatment helped to lower the HbA1c levels along with controlling dyslipidemia.

### 3.6 Medicine Reduction

A considerable reduction was also seen in the medicines taken by the patients at the start of the treatment. After the treatment, there was an 83.33% reduction in the dependency on statin. Statin plays an important role in the treatment of dyslipidemia, by lowering the LDL cholesterol and the TC. However, statin may react with other medication causing fatal conditions like severe myopathy and rhabdomyolysis in the patients [4]. This will affect the patients' capacity to carry out physical activities [6]. Therefore, alternate methods like herbal detoxification and a low calorie diet will prove to be a better solution to treat dyslipidemia without any side effects.

### 4. CONCLUSION

The present study was done on coronary artery disease patients with high total cholesterol levels. The treatment provided reduced the metabolic burden on the body along with a change in the TC, LDL cholesterol, TG and HDL cholesterol and this can be attributed to the combined effect of the low calorie diet and herbal detoxification. Further studies with a control may be performed to find out the major contributing factor between diet and herbal detoxification. It can therefore be concluded that the complementary medicine therapy provided in present study is effective in treating dyslipidemia in CAD patients.

### DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

### CONSENT

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images.

### ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

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