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Research Article

# A CLINICAL STUDY TO EVALUATE THE EFFICACY OF *VAMANA KARMA* IN THE MANAGEMENT OF DYSLIPIDEMIA

**SHIPRA SINGH*, ALOK KUMAR SRIVASTAVA**

**Department of Panchakarma, Rishikul Campus, Uttarakhand Ayurved University, Dehradun, Uttarakhand, India.**
**Email: rajshipra90@gmail.com**

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**ABSTRACT**

**Objective:** The aim of the present study is to evaluate the efficacy of *Vamana karma* in the management of dyslipidemia.

**Methods:** Patients were selected from the OPD and IPD at the Department of *Panchakarma*, Hospital of Rishikul Campus, Uttarakhand Ayurved University, Haridwar. Patients in Group A will be administered with two sittings of *Vamana* procedure. In Group B, 20 patients will be treated with atorvastatin for 60 days in dose of 10 mg once daily after meals with water.

**Results:** The overall assessment of the therapy was decided on the basis of improvement in biochemical parameter (serum lipid profile) by applying statistics. *Vamana karma* had statistically highly significant result in all the objective parameters except high-density lipoprotein [HDL].

**Conclusion:** Thus, it can be concluded that dyslipidemia is a form of *Kaphavikara* specifically may be *Medodushti* in the form of *Abaddha meda. Vamana karma* is highly effective in correcting serum lipid profile except HDL and very low-density lipoprotein but have better effect than the standard drug in both of them. *Vamana karma* can be used for the effective and safe management of dyslipidemia.

**Keywords:** Dyslipidemia, *Medodushti, Abaddha meda, Kaphavikara, Vamana.*

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## INTRODUCTION

Disorders of lipoprotein metabolism are collectively referred to as dyslipidemias [1]. It is an important risk factor in the initiation and progression of atherosclerosis and coronary heart disease [2]. The association of dyslipidemia with Type 2 diabetes mellitus (DM) as comorbidity for cardiovascular events, leading eventually to a high rate of mortality, has been a growing concern for the medical fraternity [3]. Dyslipidemia is now becoming the cause of most complicated and life-threatening disorders such as coronary artery disease, ischemic heart disease (IHD) (responsible for 56% global IHD) [4], cerebrovascular accidents, myocardial infarction (responsible for 18% global cardiovascular disease's) [4], arthritis, and various other disorders like hypertension, leading to multiorgan damage [3].

Dyslipidemias are generally characterized clinically by increased plasma levels of cholesterol and triglycerides or both, variably accompanied by reduced levels of high-density lipoprotein (HDL) cholesterol [1]. It has been proved that elevated plasma levels of cholesterol are responsible for atherosclerosis in man, and epidemiological data suggest that elevated plasma levels of HDL have a protective effect [5]. The majority of patients with dyslipidemia have some combination of genetic predisposition and environmental contribution [1]. Various allopathic drugs are being used for the management of hyperlipidemia. Statins are the most effective drugs, possess a very good lipid-lowering action, but various serious side effects such as myopathy, rhabdomyolysis, elevation in hepatic enzyme levels, memory loss, and mental confusion [6], and hence, cannot be continued for a longer duration. Hence, there is need to spread *Ayurvedic* treatment.

In Ayurveda, dyslipidemia is described under various nomenclatures such as *Medodushti*, *Atisnigdhadhatu*, and *Dushit kleda*. Dyslipidemia is a form of *Kaphavikara* specifically may be *Medodushti* in the form of *Abaddha meda. Abaddha Meda* as described by *Acharya Chakrapani* - *"Abbadhamitiasahatam"* which means the *Poshaka* or *Asthayi Medo Dhatu* which is mobile in nature and circulates in whole body with *Rasa-Rakta Dhatu* [7]. As per the Ayurveda classics, *Samshodhana* therapy is very effective in treating any disease (especially chronic illness), as it eliminates *Dosha* from the body (root of causing disease) [8]. As *Acharya Charaka* also has clearly mentioned *Vamana* in the treatment of *Santarpana Janya Vyadhi* [9]. Therefore, the current research work was carried out to evaluate the efficacy of *Vamana Karma* in the management of dyslipidemia.

## METHODS

The work has been ethically certified by the institutional ethical committee (CTRI NO. CTRI/2018/01/011573). Patients were selected from the OPD and IPD at the Department of *Panchakarma*, Hospital of Rishikul Campus, Uttarakhand Ayurved University, thereafter the patients were subjected for detailed clinical history and physical examination.

### Criteria for selection of patients

#### *Inclusion criteria*

The following criteria were included in the study:

- Patients between the age group of 20 and 60 years
- NCEP ATP III Guidelines.
  S. Cholesterol - >200 mg/dl
  S. Triglyceride - >150 mg/dl
  S. LDL - >110 mg/dl
  S. very low-density lipoprotein (VLDL) -> 41 mg/dl
  CHO/HDL Ratio - >4.97 mg/dl
  LDL/HDL Ratio - >3.55 mg/dl

- Patient having anyone the above criteria
- Patients fit for *Vamana karma*

### Exclusion criteria

The following criteria were excluded from the study:

- Age <20 years or >60 years
- Patients having serious cardiac ailments such as - myocardial infarction, malignant hypertension, and cardiac failure

- Patients with clear diagnosis of DM Type I and Type II
- Patients having disordered kidney function test (KFT) or renal markers
- Patients having untreated thyroid disorders
- Drug-induced hyperlipidemia, for example, glucocorticoid induced
- Pregnant and lactating females.

*Laboratory investigations*

- Routine hematological parameters
- Complete lipid profile
- B. sugar-fasting and post-prandial (if required)
- Thyroid function test (if required)
- KFT (if required)
- Electrocardiogram (if required).

These investigations were carried out before, in between, and after completion of therapy.

**METHODOLOGY FOR GROUP A *(VAMANA KARMA)***

**Procedure of *Vamana***
All the 20 patients were treated with *Vamana karma* in two consecutive sitting with a gap of 15 days.

***Purva Karma***

*Deepana-pachana*

It is carried out with *Dravyas* having *Vayu* and *Agni* predominant properties such as *Trikatu churna and Panchakola phanta* twice in a day with lukewarm water.

*Snehapana*

*Achha sneha (Go-Ghrita)* according to *Koshtha* of patient till appearance of *Samyaka snigdha Lakshana* was given for *Abhyantara snehapana* in increasing dose.

*Bahya snehana*

*Bahya Snehana was done with Murchhita Til Taila* for 1 day.

*Bahya Swedana*

*Bahya Swedana was carried out with Nadi Swedana.*

***Pradhana karma***
It can be divided into the following steps:

- *Aakanthapana:* Performed by milk.
- *Vamana yoga:*
  - *Madanaphala churna, Vacha churna, and Saindhava in a ratio of 4:2:1 have been taken.*
  - *Madanaphala* is the best among all *Vamaka dravya*s because of its *Anapayitva* property (devoid of complications).
  - 6–8 g dose of *Madanaphala pippali churna* is given in the present clinical study.
- *Vamanopaga dravya*s: *Yashtimadhu phanta, Madhu,* and *Saindhava*.

*Vamana yoga* was given at 5 am–7 am. Process was continued till *Samyaka shuddhi lakshana* was obtained.

***Paschata karma***
*Samsarjana karma* was followed as per type of *Shuddhi.*

**METHODOLOGY FOR GROUP B (ATORVASTATIN)**

Tablet atorvastatin was given at the dose of 10 mg once a day after meals with water for 60 days.

**Follow-up**
After the completion of the treatment in both the groups, patient was advised to visit O.P.D. at interval of 30 days.

**Assessment criteria**
Objective criteria were mainly assessed on the basis of biochemical investigations of lipid profile, body weight, and body mass index (BMI), before *Vamana Karma* and after complete treatment were assessed in terms of percentage relief and statistical evaluations (Table 1).

**Statistical analysis**
The information collected on the basis of above observations was subjected to statistical analysis using GraphPad Instat, Software version 3.10 and SPSS software. The criteria selected for analysis were non-parametric, i.e., grading for objective parameters was taken except the ratios which were taken as parametric entities. Hence, "Wilcoxon signed-rank test" within the group and "Mann–Whitney test" for intergroup comparison were applied for non-parametric statistical improvement analysis, but for the ratios, parametric test applied, i.e., paired *t*-test within the group and unpaired *t*-test for intergroup comparison. In the above statistical tools, the probability value 0.05 is considered as statistically significant level.

**RESULTS**

The study sample consisted of 40 patients, 20 patients in each Group A and B, respectively.

**Intragroup comparison - Group A**
As shown in Tables 2 and 3, the mean value of S. cholesterol reduced by 1.80 (76.6%), S. triglyceride reduced by 1.15(79.3%), S. VLDL reduced from 0.70 to 0.10 (85.71%), S. LDL reduced by 0.95 (67.85%), LDL: HDL reduced by 0.99 (26.80%), total cholesterol: HDL reduced by 1.59 (25.44%), increase of 0.10 (6.9%) was observed in S. HDL level, and BMI reduced from 0.90 to 0.45.

**Intragroup comparison - Group B**
As shown in Tables 4 and 5, the mean value of S. cholesterol reduced by 1.85 (78.72%) S. triglyceride reduced by 1.25 (83.3%), S. LDL reduced by 1.05 (72.41%), S. VLDL reduced by 0.75 (75%), LDL: HDL reduced by 0.89 (26.33%), total cholesterol: HDL reduced by 2.09 (31.79%), fall of 0.05 (3.22%) was observed in S. HDL, and BMI reduced from 1.20 to 1.05.

**Intergroup comparison (A and B)**
As shown in Tables 6 and 7, intergroup comparison was performed between Group A and Group B to compare the efficacy of *Vamana Karma* in comparison to the control drug, i.e., atorvastatin which showed that there was no significant difference in all the parameters taken.

*S. Cholesterol*

Tablet atorvastatin was found more effective in lowering S. cholesterol values by 0.05 as compared to results in Group A which was found statistically non-significant.

*S. Triglyceride*

Results obtained in Group B were better as compared to Group A by 0.10 with statistical non-significance.

*S. LDL*

Group B showed more effective results by 0.10 with non-significant p value.

*S. VLDL*

Group B showed mild improved result by 0.15 as compared to Group A with non-significant p value.

*S. HDL*

Group A showed much better results in improving S. HDL in comparison to negative results obtained in Group B with statistical non-significance.

**Table 1: Criteria for examination and assessment**

| Variables | Grade | Points |
|---|---|---|
| Cholesterol | | |
| <180 | Desirable | 0 |
| 180–199 mg/dl | Near optimal | 1 |
| 200–239 mg/dl | Borderline high | 2 |
| >240 mg/dl | High | 3 |
| Triglycerides | | |
| <150 mg/dl | Desirable | 0 |
| 150–199 mg/dl | Borderline | 1 |
| 200–499 mg/dl | High | 2 |
| >500 mg/dl | Very high | 3 |
| LDL | | |
| <100 | Desirable | 0 |
| 100–129 mg/dl | Near optimal | 1 |
| 130–159 mg/dl | Borderline High | 2 |
| 160–189 mg/dl | High | 3 |
| ≥190 | Very high | 4 |
| VLDL | | |
| <40 | Desirable | 0 |
| 40–60 mg/dl | High | 1 |
| >60 mg/dl | Very high | 2 |
| HDL | | |
| >60 mg/dl | Desirable | 0 |
| 40–60mg/dl | Low | 1 |
| <40 mg/dl | Very low | 2 |
| BMI | | |
| 18.5–25 | Normal weight | 0 |
| 25–30 | Overweight | 1 |
| 30–35 | Obese Class I (moderately obese) | 2 |
| 35–40 | Obese Class II (severely obese) | 3 |
| >40 | Obese Class III (very severely obese) | 4 |

LDL: Low-density lipoproteins, VLDL: Very low-density lipoproteins, HDL: High-density lipoproteins, BMI: Body mass index

**Table 2: Effect of *Vamana karma* (Group A) on objective parameters of dyslipidemia (Wilcoxon signed-rank test)**

| Variables | Sample size | Mean | | Mean difference | % change |
|---|---|---|---|---|---|
| | | BT | AT | | |
| Cholesterol | 20 | 2.35 | 0.55 | 1.80 | 76.6 |
| Triglycerides | 20 | 1.45 | 0.30 | 1.15 | 79.3 |
| LDL | 20 | 1.40 | 0.45 | 0.95 | 67.85 |
| VLDL | 20 | 0.70 | 0.10 | 0.60 | 85.71 |
| HDL | 20 | 1.45 | 1.55 | 0.10 | 6.9 |
| BMI | 20 | 0.90 | 0.45 | 0.45 | 50 |

LDL: Low-density Lipoprotein, VLDL: Very low-density lipoprotein, HDL: High-density lipoprotein, BMI: Body mass index, BT: Before treatment, AT: After treatment

*LDL: HDL*

Group A showed more effective results with statistical non-significance.

*Cholesterol: HDL*

Group B proved better but with statistical insignificance.

*BMI*

Group A treatment was found more effective which is statistical insignificance.

**Overall assessment of therapy**

The percentage improvement of S. cholesterol, S. triglyceride, S. LDL, and S. VLDL was calculated for assessment as shown in Table 8.

**Follow-up study**

Follow-up was done after 1 month of completion of treatment. After 1 month, all the objective parameters shown slight increment in both the groups, but Group A is found to have better follow-up in S. HDL and BMI.

**Table 3: Effect of *Vamana karma* (Group A) on objective parameters of dyslipidemia (paired t-test)**

| Variables | Mean | n | SD | SE |
|---|---|---|---|---|
| LDL: HDL | | | | |
| BT | 3.71 | 20 | 0.733 | 0.164 |
| AT | 2.72 | 20 | 0.583 | 0.130 |
| CHO: HDL | | | | |
| BT | 6.25 | 20 | 1.382 | 0.309 |
| AT | 4.66 | 20 | 0.694 | 0.155 |

LDL: Low-density lipoprotein, HDL: High-density lipoprotein, CHO: Cholesterol, BT: Before treatment, AT: After treatment, SD: Standard deviation, SE: Standard error of the mean, N: Sample size

**Table 4: Effect of tablet atorvastatin (Group B) on objective parameters of dyslipidemia (Wilcoxon signed-rank test)**

| Variables | Sample size | Mean | | Mean difference | % change |
|---|---|---|---|---|---|
| | | BT | AT | | |
| Cholesterol | 20 | 2.35 | 0.50 | 1.85 | 78.72 |
| Triglycerides | 20 | 1.50 | 0.25 | 1.25 | 83.3 |
| LDL | 20 | 1.45 | 0.40 | 1.05 | 72.41 |
| VLDL | 20 | 1.00 | 0.25 | 0.75 | 75 |
| HDL | 20 | 1.55 | 1.50 | -0.05 | -3.22 |
| BMI | 20 | 1.20 | 1.05 | 0.15 | 12.5 |

LDL: Low-density lipoprotein, VLDL: Very low-density lipoprotein, HDL: High-density lipoprotein, BMI: Body mass index, BT: Before treatment, AT: After treatment

**Table 5: Effect of tablet atorvastatin (Group B) on objective parameters of dyslipidemia (paired t-test)**

| LDL: HDL | Mean | n | SD | SE |
|---|---|---|---|---|
| BT | 3.40 | 20 | 0.841 | 0.188 |
| AT | 2.51 | 20 | 0.593 | 0.133 |
| CHO: HDL | | | | |
| BT | 6.58 | 20 | 1.325 | 0.296 |
| AT | 4.49 | 20 | 1.000 | 0.224 |

LDL: Low-density lipoprotein, HDL: High-density lipoprotein, CHO: Cholesterol, BT: Before treatment, AT: After treatment, SD: Standard deviation, SE: Standard error of the mean, N: Sample size

**Table 6: Intergroup comparison (unpaired t-test)**

| Variables | Mean | n | SD | SE | Result |
|---|---|---|---|---|---|
| LDL: HDL | | | | | |
| Group a | 0.995 | 20 | 0.558 | 0.125 | NS |
| Group B | 0.896 | 20 | 0.946 | 0.212 | |
| CHO: HDL | | | | | |
| Group A | 1.590 | 20 | 1.057 | 0.236 | NS |
| Group B | 2.092 | 20 | 0.987 | 0.221 | |

LDL: Low-density lipoprotein, HDL: High-density lipoprotein, CHO: Cholesterol, NS: Non-significant, SD: Standard deviation, SE: Standard error of the mean, N: Sample size

## DISCUSSION

*Vamana* is a safe *Panchakarma* procedure if undertaken methodically. It is a cleansing process that improves appetite, regulates bowel habits, and improves sleep pattern. It decreases LDL and serum cholesterol level as a part of its *Kapha hara* action [10]. Few researches have shown the multisystem effects of *Vamana karma* without any side effects.

Sangeeta *et al*. found in a single case study of a 26-year-old male patient presented with increased lipid profile in which classical *Vamana karma* was done as the line of management that cholesterol and triglycerides had come down after the *Vamana* procedure [11]. According to another study carried out by Gupta *et al*. on 15 healthy

**Table 7: Intergroup comparison (Mann–Whitney test)**

| Variables | Group | n | Mean rank | Sum of ranks | Mann–Whitney U | result |
|---|---|---|---|---|---|---|
| Cholesterol | Group A | 20 | 1.800 | 406.5 | 196.5 | NS |
| | Group B | 20 | 1.850 | 413.5 | | |
| Triglycerides | Group A | 20 | 1.150 | 394.5 | 184.5 | NS |
| | Group B | 20 | 1.250 | 425.5 | | |
| LDL | Group A | 20 | 0.950 | 395.5 | 185.5 | NS |
| | Group B | 20 | 1.050 | 424.5 | | |
| VLDL | Group A | 20 | 0.6000 | 395 | 185 | NS |
| | Group B | 20 | 0.7500 | 425 | | |
| HDL | Group A | 20 | 0.1000 | 437.50 | 172.5 | NS |
| | Group B | 20 | −0.0500 | 382.50 | | |
| BMI | Group A | 20 | 0.4500 | 465.5 | 144.5 | NS |
| | Group B | 20 | 0.1500 | 354.5 | | |

LDL: Low-density lipoprotein, VLDL: Very low-density lipoprotein, HDL: High-density lipoprotein, BMI: Body mass index, BT: Before treatment, AT: After treatment, NS: Non-significant

**Table 8: Overall assessment of the therapy**

| Overall effect | Group A | Group B |
|---|---|---|
| | Frequency (%) | Frequency (%) |
| Complete resolution | 1 (5) | 0 (0) |
| Marked improvement | 4 (20) | 2 (10) |
| Moderate improvement | 11 (55) | 12 (60) |
| Mild improvement | 4 (20) | 6 (30 |
| No change | 0 (0) | 0 (0) |
| Total | 20 (100) | 20 (100) |

volunteers to evaluate the physiological and biochemical changes in *Vamana karma,* it was found that there was decrease in the LDL and cholesterol during as well as after the procedure [10]. In a study performed by Sharma *et al.* in which *Vamana karma* done with *Dhamargava kalpa* followed by *Lekhaneeya ghana vati* as *Shamana aushadhi* has given statistically significant results in lowering lipid levels. In different parameters of lipid profile, the mean reduction of serum cholesterol and serum triglycerides showed better results statistically [12].

This study is an attempt to prove the efficacy of Ayurvedic biopurificatory measure, i.e., *Vamana karma* in comparison to the prevailing allopathic treatment, i.e. atorvastatin as a control group for dyslipidemia. Thus, the lipid-lowering action of *Vamana karma* occurs mainly through two pathways -

1. By eliminating out excess circulating lipids (*Kapha Dosha*) - *Vamana* eliminates specifically *Kapha Dosha* which belongs to *MedoDhatu,* thus having its direct effect on fat tissue and thus decreasing lipid levels.
2. By correcting the lipoprotein metabolism in liver **-** *Vamana* also has moderate action on bringing *Pitta* to a state of normalcy. *Pitta* is responsible for all the digestion (*Paka*) and metabolism (*Parinama*) in the body and dyslipidemia is a disorder of deranged lipid metabolism, i.e., a disturbed state of *Pitta*. Hence, by controlling the vitiated state of *Pitta*, *Vamana* corrects the malproduction of lipids and brings a state of equilibrium. Furthermore, the main seat of *Pitta* is *Yakrita* (liver) which controls the formation of lipids and *Vamana karma* having direct effect on liver functioning controls the whole metabolism of lipid formation and excretion.

## CONCLUSION

*Vamana karma* is highly effective in correcting serum lipid profile except HDL and VLDL but have better effect than the standard drug in both of them. *Vamana karma* can be used for the effective and safe management of dyslipidemia.

## AUTHORS' CONTRIBUTIONS

SHIPRA Singh - has conducted the study clinically.Dr. Alok Kumar Srivastava - has provided the design and protocol for conducting the study along with mentorship.

## CONFLICTS OF INTEREST

The author declares that there are no conflicts of interest regarding the publication of the article.

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