



ORIGINAL ARTICLE

“Changes In Lipid Profile Among Patients With Dyslipidemia Associated With *Gridhrasi* Undergoing *Rukshana* Based Ayurvedic Management – An Observational Pilot Study”

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Abstract

Background

Dyslipidemia is a major global health concern characterized by abnormal lipid levels in the blood, affecting both urban and rural populations. In Ayurveda, dyslipidemia can be correlated with excessive *Santarpana* (overnourishment), leading to *Santarpanajanya Vikaras*, particularly involving disturbances in *Medo Dhatu* (fat tissue). *Rukshana* (drying) therapies mentioned in Ayurveda can be indicated for such conditions.

Objective:

To evaluate the effectiveness of *Rukshana* based treatment protocols in the management of dyslipidemia associated with *Gridhrasi* by assessing changes in lipid profile parameters.

Methods:

An observational study was conducted from March to December 2024 at the Government Ayurveda College Hospital, Kannur. Twenty-five patients aged 30–64 years diagnosed with both dyslipidemia and *Gridhrasi*, undergoing *Rukshana* therapies were included in the study. Lipid profile parameters were assessed before and after treatment. Statistical analysis was performed using descriptive statistics and paired t-test.

Results:

The mean total cholesterol level significantly decreased from 236.80 mg/dL before treatment to 207.36 mg/dL after treatment, with a mean reduction of 29.44 mg/dL ($p < 0.05$). LDL levels showed statistically significant decrease after treatment, with the mean dropping from 156.64 to 133.32 mg/dL. Triglyceride levels showed a slight decrease after treatment, with the mean dropping from 191.12 to 181.08 mg/dL.

Conclusion:

Rukshana therapies demonstrated significant improvement in total cholesterol and LDL cholesterol levels among patients with dyslipidemia. These findings suggest a possible association between *Rukshana* based Ayurvedic management and improvements in the selected lipid parameters control studies are required to establish the efficacy.

Introduction

Dyslipidemia refers to abnormal levels of lipids in the blood, including cholesterol, low-density lipoproteins (LDL), triglycerides, and high-density lipoproteins (HDL).¹ In India, high cholesterol is reported in approximately 25–30% of urban populations and 15–20% of rural populations.² Lipids play essential roles in various physiological functions, and cholesterol, triglycerides, LDL (low-density lipoproteins), and HDL (high-density lipoproteins) constitute key components of the lipid profile.³ Dyslipidemia occurs when these lipid or lipoprotein levels become altered due to genetic or environmental factors affecting the synthesis, metabolism, and clearance of plasma lipoproteins.⁴

In Ayurveda, conditions arising from excessive nourishment (*Santarpana*) are termed *Santarpanajanya Vikaras* (diseases caused by overnourishment).⁵ Dyslipidemia can be correlated with *Santarpanajanya Vikara*, primarily involving vitiation of *Medo Dhatu* (fat tissue). Ayurveda advocates *Apatarpana Chikitsa* (depleting therapy) for the management of such disorders.⁵ Acharya Charaka described *Shadvidhopakramas* (six therapeutic modalities), namely *Langhana* (lightening therapy), *Brimhana* (nourishing therapy), *Rukshana* (drying therapy), *Snehana* (oleation therapy), *Swedana* (sudation therapy), and *Sthambhana* (astringent therapy).⁶ Among these, *Rukshana* is considered a form of *Apatarpana Chikitsa* suitable for conditions associated with excessive unctuousness, obstruction of bodily channels, and vitiation of *Kapha* and *Meda*.⁷

Rukshana therapy can be administered both internally and externally and is known to induce dryness (*Roukshya*), roughness (*Kharatwa*), and clarity (*Vaishadya*) in the body, thereby facilitating detoxification and restoration of metabolic balance.⁷ These therapies are commonly employed as a *Purvakarma* (preparatory procedure) in the management of *Vatavyadhis* before administering *Brimhana* therapies. Among *Vatavyadhis*, *Gridhrasi* is one of the most frequently encountered conditions in clinical practice. According to Ayurveda, aggravated *Vata* situated in the *Sphik* (hip region) produces symptoms such as *Stambha* (stiffness), *Ruk* (pain),

and *Toda* (pricking sensation), radiating to the *Kati* (low back), *Prishta* (back), *Janu* (knee), *Jangha* (calf), and *Pada* (foot).⁸ In *Vatakaphaja Gridhrasi*, symptoms such as *Tandra* (drowsiness), *Gourava* (heaviness), and *Arochaka* (loss of appetite) are also observed, indicating the involvement of *Kapha* and *Meda*.⁸ Although various therapeutic interventions are employed in the management of *Vatavyadhis*, with *Brimhana* being a primary approach, Ayurvedic treatment typically commences with *Laghu Rukshana*.⁹ This *purvakarma* is done to eliminate the *Upasthambha* (obstruction) caused by other *Doshas*, in accordance with the *Ruksha* (dry) and *Laghu* (light) properties of *Vata*.

Commonly practiced *Rukshana* procedures include *Churna Pinda Sweda*, *Valuka Sweda*, *Udvarthana*, *Dhanyamladhara*, and *Kashayadhara*. These therapies may help reduce excessive *Meda*, remove channel obstruction, and improve metabolic functions, thereby contributing to better lipid regulation.

Considering the increasing prevalence of dyslipidemia and the frequent association of metabolic disturbances in patients with *Gridhrasi*, *Rukshana* therapies may offer beneficial therapeutic potential. However, scientific evidence evaluating their effect on lipid profile parameters in such patients remains limited.

Therefore, the present study was undertaken to evaluate the effectiveness of *Rukshana* therapies in patients with dyslipidemia associated with *Gridhrasi*. The primary outcome assessed was the reduction in total cholesterol levels following treatment. Secondary outcomes included changes in serum LDL, HDL, and triglyceride levels

Subjects and Methods

Patients diagnosed with dyslipidemia associated with *Gridhrasi* and satisfying the eligibility criteria were recruited from the Inpatient Department (IPD) of Government Ayurveda College Hospital, Kannur, during the period from March 2024 to December 2024. Written informed consent was obtained from all participants prior to enrolment and initiation of treatment.

Study Design

Observational hospital-based pilot study.

Study Duration

10 months (March 2024 – December 2024)

Study Population

Individuals aged between 30 and 64 years diagnosed with both dyslipidemia and *Gridhrasi*, undergoing *Rukshana* therapy in the IPD of Government Ayurveda College Hospital, Kannur.

Sampling Method

Consecutive sampling.

Sample Size

A total of 25 participants were included in the study. The sample size was selected pragmatically for this pilot observational study to evaluate the feasibility of recruitment, intervention implementation, outcome assessment, and data collection procedures. The findings are intended to provide preliminary data and support planning for future large-scale studies.

Eligibility Criteria

Inclusion Criteria

Patients aged 30–64 years.

Patients diagnosed with dyslipidemia confirmed by fasting lipid profile showing one or more of the following abnormalities:

Total cholesterol >200 mg/dL, LDL cholesterol >130 mg/dL, Triglycerides >150 mg/dL, HDL cholesterol <40 mg/dL in males and <50 mg/dL in females.

Patients diagnosed with *Gridhrasi* based on classical signs and symptoms such as:

Ruk (pain), *Toda* (pricking sensation), *Stambha* (stiffness), radiating pain from *Sphik* (gluteal region) to *Pada* (lower limb), and difficulty in leg movements

Patients willing to undergo Rukshana therapy and willing to provide informed consent.

Exclusion Criteria

Patients with severe systemic illnesses such as uncontrolled diabetes mellitus, hepatic disorders, renal disorders, or cardiovascular diseases.

Pregnant and lactating women.

Patients with traumatic spinal injuries, malignancy, or neurological disorders affecting lower limbs.

Intervention

All participants underwent *Rukshana* therapy in dyslipidemia associated with *Gridhrasi*. The therapy included appropriate external and internal *Rukshana* measures based on the patient's clinical condition.

Outcome Measures

The primary outcome measure was change in serum total cholesterol levels before and after completion of therapy.

Secondary lipid profile parameters assessed included:

Low-density lipoprotein (LDL), High-density lipoprotein (HDL), Triglycerides (TG)

Clinical assessment of *Gridhrasi* symptoms such as pain, stiffness, radiating pain, and difficulty in movement was also documented using standard clinical assessment criteria.

Statistical Analysis

Data obtained were entered into Microsoft Excel and analysed using SPSS version 26.

Pre- and post-treatment comparisons were analysed using appropriate statistical tests. A p-value of <0.05 was considered statistically significant.

Results: Out of 25 selected cases, the distribution of therapeutic interventions was as follows:

Among 25 participants *Churna pinda sweda* was administered to 16 participants, *Dhanyamladhara* was administered for 6 participants and *Udvarthana* was administered for 3 participants.

Internal medications like *Kashayas*, *Gulikas*, *Churnams* and *Arishtas* were administered to participants according to the condition of patient.

Out of 25 participants women constituted 60%, while men comprised 40%. Numerous studies have indicated that women are more susceptible to dyslipidemia than men. This gender disparity can be attributed to postmenopausal hormonal changes, where the decline in estrogen levels leads to a shift towards a more atherogenic lipid profile which is characterized by increased LDL-C and total cholesterol, and decreased HDL-C.¹⁰

In this study, 40% of participants were from lower socioeconomic status and 60% from the middle class, reflecting Kerala's transitional socioeconomic landscape. While the state has reduced poverty and built a strong middle class, disparities persist. This distribution highlights the need for targeted interventions to address remaining economic gaps.¹¹

In the present study, 48% of participants diagnosed with dyslipidemia were classified under the "others" occupational category, encompassing professions such as drivers, accountants, and tailors. Additionally, 32% of the affected individuals were homemakers. The elevated prevalence of dyslipidemia among individuals in the "others" occupational category may be attributed to work-related factors such as sedentary behaviour, psychological stress, and irregular schedules, all of which are known to negatively influence lipid metabolism¹². Existing literature further supports the association between such occupational profiles and an increased risk of dyslipidemia and metabolic syndrome¹². Similarly, homemakers despite participating in domestic activities may encounter insufficient physical exertion, suboptimal dietary patterns, and psychosocial stressors, which collectively contribute to the development of dyslipidemia.

Table 1. Table Of Rukshana Procedures

Name of procedure	Number of patients	Number of Days of Rukshana procedure
<i>Churna Pinda Sweda</i> (<i>kolakulathadi churna</i>)	16	7
<i>Dhanyamla dhara</i>	6	7
<i>Udvarthanam</i>	3	7

Table 2. Table Of Internal Medicines

<i>Kashaya (90 ml bd)</i>	<i>Gulika (1-0-1)</i>	<i>Churnam (5gm hs)</i>	<i>Arishta (15 ml bd)</i>
<i>Gandharvahasthadi</i>	<i>Kaisora guggulu</i>	<i>Triphala</i>	<i>Abhaya</i>
<i>Amritotharam</i>	<i>Shaddharanam</i>	<i>Avipathy</i>	<i>Punarnavasavam</i>
<i>Guduchyadi</i>	<i>Sudharsanam</i>	<i>Vaiswanaram</i>	
<i>Rasnerandadi</i>	<i>Vilwadi</i>	<i>Trivrith</i>	
<i>Maharasnadi</i>	<i>Shallaki</i>		
<i>Dasamoola katutravam</i>			
<i>Punarnavadi</i>			

Table 3. Frequency Distribution Table

Category	Sub category	Frequency	Percentage
Sex	Male	10	40%
	Female	15	60%
Socio economic status	Lower	10	40%
	Middle	15	60%
	Upper	0	0%
	Labourer	5	20%
Occupation	Business	0	0%
	Govt job	0	0%
	Homemaker	8	32%
	Others	12	48%

Table 4. Assessment of Lipid Profile – Total Cholesterol

		Mean Before treatment	Mean After treatment	SD Before Treatment	SD After Treatment				
Total Cholesterol		236.80 mg/dl	207.36 mg/dl	26.231	21.585				
Paired Samples Test									
		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		T	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	TOTAL CHOLESTEROL BEFORE TREATMENT - TOTAL CHOLESTEROL AFTER TREATMENT	29.440	25.043	5.009	19.103	39.777	5.878	24	.000

Table 5. Assessment of Lipid Profile – LDL

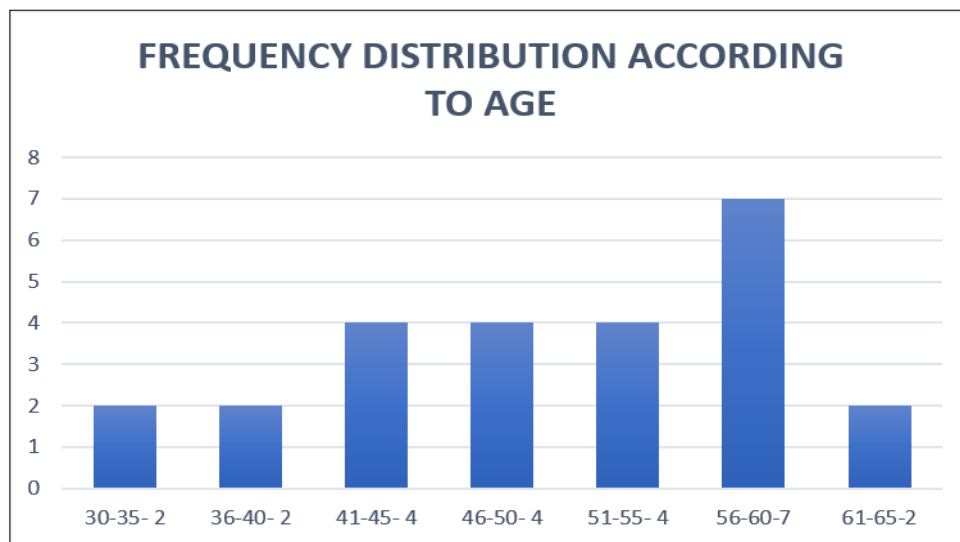
		Mean Before treatment		Mean After treatment		SD Before Treatment		SD After Treatment	
LDL		156.64mg/dl		133.32 mg/dl		25.313		20.724	
Paired Samples Test									
		Paired Differences							
					95% Confidence Interval of the Difference		t	Df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean					
					Lower	Upper			
Pair 1	LDL - BEFORE TREATMENT - LDL AFTER TREATMENT	23.320	25.865	5.173	12.644	33.996	4.508	24	.000

Table 6. Assessment of Lipid Profile – Triglyceride

	Mean Before treatment	Mean After treatment	SD Before Treatment	SD After Treatment					
Triglyceride	191.12 mg/dl	181.08 mg/dl	61.285	73.707					
Paired Samples Test									
Paired Differences									
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference	T	Df	Sig. (2-tailed)		
				Lower	Upper				
Pair 1	TRIGLYCERIDE BEFORE TREATMENT - TRIGLYCERIDE AFTER TREATMENT	10.040	66.622	13.324	-17.460	37.540	.754	24	.458

Table 7. Assessment of Lipid Profile – HDL

		Mean Before treatment	Mean After treatment	SD Before Treatment	SD After Treatment				
HDL		42.24 mg/dl	37.52 mg/dl	5.826	5.709				
Paired Samples Test									
		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		T	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	HDL - BEFORE TREATMENT - HDL AFTER TREATMENT	4.720	8.299	1.660	1.294	8.146	2.844	24	.009

Descriptive statistics**Analysis of Total Cholesterol**

t-Test: The mean difference was 29.44 mg/dL, with a 95% confidence interval from 19.103 to 39.777. The t-statistic was 5.878 (df = 24), and the p-value is 0.000, ($p < 0.05$) indicating a significant reduction in total cholesterol levels post-treatment.

Analysis of LDL

t – Test: The mean reduction in LDL levels was 23.32 mg/dl (SD = 25.87), with a 95% confidence interval ranging from 12.64 to 34.00. The t-statistic was 4.508 (df = 24) and p value is 0.000, ($p < 0.05$) indicating that the treatment significantly decreased LDL cholesterol levels.

Analysis of Triglycerides

t-Test: Triglyceride levels showed a slight decrease after treatment with a mean difference of 10.04 mg/dL, with a 95% confidence interval ranging from -17.460 to 37.540. The t-statistic was 0.754 (df = 24), and the p-value was 0.458 ($p > 0.05$), indicating that there was no statistically significant difference in triglyceride levels before and after treatment.

Analysis of HDL

t-Test: The mean difference was 4.72 mg/dL, with a 95% confidence interval ranging from 1.294 to 8.146. The t-statistic was 2.844 (df = 24), and the p-value was 0.009 ($p < 0.05$), indicating a statistically significant difference in HDL levels is an unfavourable outcome after treatment.

DISCUSSION

Dyslipidemia is a metabolic disorder characterized by abnormal levels of lipids in the blood, including elevated total cholesterol, low-density lipoprotein (LDL), triglycerides, and/or decreased high-density lipoprotein (HDL). It is a major risk factor for cardiovascular diseases, obesity, insulin resistance, and other metabolic syndromes. In Ayurveda, dyslipidemia is viewed as a *Kapha-Medaja Vikara* and can be managed through *Rukshana* therapies administered both internally and externally.

In this study, the therapeutic effect of various *Rukshana* procedures in the management of dyslipidemia was observed, with a focus on understanding physician preferences and patient-specific *dosha* predominance. *Rukshana* therapy, by its very nature, induces *Roukshya* (dryness), *Kharatwa* (roughness), and *Vaishadya* (non-sliminess) in the body, thereby counter acting the *Snigdha* (unctuous), *Guru* (heavy), and *Picchila* (slimy) qualities associated with *Kapha* and *Meda doshas*.

Ruksha dravyas are characterized by properties such as *Ruksha* (dry), *Laghu* (light), *Khara* (rough), *Ushna* (hot), *Sthira* (stable), and *Apicchila* (non-slimy), making them suitable for conditions involving *Kapha-Meda* predominance¹³. According to Ayurveda, *Udwarthana* is considered one of the most effective *Rukshana* therapies for *Kapha-Medaja Vikaras* due to its direct action in reducing excessive *Meda* and *Kapha* through frictional massage using dry powders.¹⁴

However, in the current study, the majority of the participants (64%) were administered *Churna Pinda Sweda*, indicating a shift in therapeutic approach based on presenting clinical features. This choice appears to have been influenced by the *Vata-Kapha* predominance in the symptomatology of the patients, rather than a pure *Kapha-Meda* presentation.

Churna Pinda Sweda, a type of *Ruksha Sankara Sweda*, combines the effects of *Tikshna*, *Ruksha*, and *Ushna* qualities. The boluses used in this treatment are typically composed of medicated powders such as *Kolakulathadi Churna*, which includes ingredients like *Kola*, *Kulatha*, *Yava*, *Masha*, *Amarataru*, *Atasi*, *Kushta*, *Vacha*, *Rasna*, and *Sarshapa*¹⁵. This formulation is traditionally considered beneficial in reducing subcutaneous fat, improving circulation, and alleviating joint stiffness, which are common complaints in patients with dyslipidemia and associated metabolic disturbances.

Dhanyamladhara, administered in 24% of the cases, is primarily indicated in *Pitta-Vata* predominant conditions. The *Dhanyamla* used is a fermented liquid prepared from various grains and herbs, known for its mildly acidic, *Snigdha*, and *Ushna* properties that help balance *Vata* and *Pitta*¹⁶. Although inherently cooling in nature, when used in *Parisheka* form, it

may provide a warming therapeutic effect and support *Ama pachana* and *Srotoshodhana*.

Only a small proportion of patients (12%) were treated with *Udwarthana*, despite its classical indication in *Kapha-Medaja Vikaras*. This lower utilization may be attributed to the clinical judgment of physicians who observed a stronger *Vata* component in the majority of patients, for which *Udwarthana*, being highly drying and frictional, may not have been ideal. Patient tolerance and *Prakriti* (body constitution) may also have influenced treatment selection.

EFFECT OF RUKSHANA THERAPY ON LIPID PROFILE

TOTAL CHOLESTEROL

Rukshana therapy led to a significant reduction in total cholesterol (mean drop: 29.44 mg/dL, $p < 0.05$), indicating improved lipid metabolism. This effect could be due to enhanced LDL receptor sensitivity, increased reverse cholesterol transport, and reduced hepatic VLDL production each contributing to lower circulating cholesterol.¹⁷

LDL

Rukshana therapy resulted in a statistically significant reduction in LDL-C (mean drop : 23.32 mg/dl, $p < 0.05$). This suggests enhanced LDL receptor sensitivity, promoting hepatic clearance of circulating LDL particles. Additionally, the therapy may support reverse cholesterol transport and reduce hepatic VLDL production, limiting LDL formation.¹⁸

Triglyceride

Triglyceride levels showed a slight decrease after treatment with a mean difference of 10.04 mg/dL, indicating a favourable metabolic shift. This trend may be attributed to improved insulin sensitivity, which enhances lipid utilization and reduces hepatic triglyceride synthesis. Additionally, increased lipoprotein lipase activity could facilitate peripheral breakdown of triglyceride-rich lipoproteins.¹⁹

HDL

HDL level showed an unfavourable outcome after treatment because there was significant reduction after treatment. While HDL is protective due to its role in reverse cholesterol transport, certain therapies may paradoxically lower HDL levels through redistribution of cholesterol fractions or increased catabolism of HDL particles.²⁰ Although total cholesterol and LDL improved, the significant reduction in HDL represent a potentially adverse effect.

The study was conducted at a single center with a relatively small sample size and short duration of observation, which may limit the strength and external validity of the findings. In addition, the absence of randomization and

standardized allocation of therapies introduces the possibility of selection bias and physician-related treatment preference bias. Since treatment decisions were based primarily on individualized clinical judgment and *dosha* assessment, variations among physicians may also have influenced therapeutic selection and outcomes.

The generalizability of these findings beyond the study setting, particularly outside Kerala or in populations with differing dietary habits, lifestyle patterns, and clinical practices, remains uncertain. Furthermore, as this was an observational study without a control group, inferences regarding the superiority or comparative efficacy of one *Rukshana* therapy over another cannot be established.

Further large-scale, multicentric, randomized controlled studies with longer follow-up periods are required to validate these observations and establish standardized treatment protocols for dyslipidemia in Ayurvedic practice.

Conclusion

This pilot observational study suggests the potential effectiveness of *Rukshana* therapies, particularly *Churna Pinda Sweda*, *Dhanyamladhara*, and *Udwarthana*, in the management of dyslipidemia associated with *Gridhrasi*. A statistically significant reduction in total cholesterol levels was observed following treatment, with a mean decrease of 29.44 mg/dL ($p < 0.05$), indicating a possible beneficial role of these interventions in correcting lipid imbalances associated with metabolic disorders. Similarly, LDL cholesterol levels showed a significant reduction, with a mean decrease of 23.32 mg/dl ($p < 0.05$). Triglyceride levels showed reduction after treatment, with a mean difference of 10.04 mg/dL ($p > 0.05$), indicating that the reduction was not statistically significant. HDL levels decreased after treatment, with a mean difference of 4.72 mg/dL, ($p < 0.05$), indicating an unfavourable outcome after *Rukshana* therapy. Observed reduction in the total cholesterol and LDL may indicate improved lipid metabolism, however the exact mechanisms were not evaluated in the present study.

Churna Pinda Sweda was the most commonly administered *Rukshana* procedure in this cohort. The use of internal medicines such as *Gandharvahasthadi Kashaya*, *Kaisora Guggulu*, *Triphala churna*, etc may have contributed to the observed therapeutic outcomes.

Rukshana therapies, such as *Dhanyamladhara* and *Udwarthana*, were administered to a smaller group of participants than *Churna Pinda Sweda*, based on the patients' *dosha* predominance and clinical condition.

However, as this was a pilot observational study, larger randomized controlled trials with longer follow-up periods are needed to confirm these results, evaluate long-term safety and efficacy, and support the development of evidence-based clinical guidelines for the management of dyslipidemia associated with conditions such as *Gridhrasi*.

LIMITATIONS

The concurrent administration of multiple internal medicines may have contributed to the observed changes in the lipid profile.

While total cholesterol and LDL levels showed significant improvement, the marked reduction in HDL represents an unfavourable outcome that warrants further investigation.

Dietary intake was not standardised during the study.

Assessment of physical activities were not done.

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