

Assessment of Atherogenic Indices after treating with *Sookshma Eladi Churnam* in Hyperlipidaemia - A Case Study

Case Report

Harinatha Chary B^{1*}, Manu R², Gnana Prasuna S³

1. Ph.D. Scholar, 2. Professor, 3. Ph.D Scholar,
Department of Kayachikitsa, Parul Institute of Ayurved, Parul University, Vadodara.

Abstract

Background: Hyperlipidaemia is one of the most important conditions to cause atherosclerosis. Atherosclerosis is a major risk factor for coronary artery disease (CAD). CAD has become the epidemic of modern civilization in which Hyperlipidaemia predominantly contributes to its pathogenesis. There are certain atherogenic ratios that are strongly predictive of CAD. Three important atherogenic ratios are Atherogenic Index of Plasma (AIP), Castelli's Risk Index I & II (CRI-I & CRI-II). We studied the significance of these atherogenic ratios in a case study having hyperlipidaemia by giving Ayurvedic drug *Sookshma eladi choornam*. **Methods:** A 53-year-old patient presented with tiredness, shortness of breath on exertion, heaviness of the body parts for the past 4 months. Management was done on OPD based treatment. The patient was administered 3 grams of *Sookshma eladi choornam* orally with *go ghrta* as *anupana*. **Result:** There was a marked reduction in symptoms like tiredness, heaviness and shortness of breath with three months of treatment. The lipid values after three months of treatment and follow up of one month showed a marked reduction in TC (Total Cholesterol), TG (Triglyceride), LDL-C (Low density lipoprotein – Cholesterol) and increase in HDL (High density lipoprotein – Cholesterol). **Conclusion:** Significant result was observed in both subjective symptoms and in objective parameters after administering *Sookshma eladi choornam*.

Key Words: Hyperlipidaemia, Atherosclerosis, Coronary artery disease, Atherogenic Index of Plasma, Castelli's Risk Index I & II.

Introduction

One-third of deaths worldwide are due to Cardiovascular diseases. The risk is still being in an increased scenario in both developing and developed countries because of increasing risk factors like obesity, hyperlipidaemia, diabetes mellitus, poor physical activity and smoking (1). Among them hyperlipidaemia is the dominant risk factor and strong predictive indicator of Coronary artery disease (CAD) (2).

According to Ayurveda the etiological factors like *medhyanam chaatibhakshanam* (excess intake of fatty food), *varuni sevana* (excess alcohol consumption), *Ayayama* (lack of physical exercise), *Diwasawapna* (day sleep) lead to accumulation of morbid *medas* or lipids contributing to hyperlipidaemias.

Hyperlipidaemia is a condition where there is elevated plasma concentration of lipids (total cholesterol (TC), triglyceride (TG) and their blood transporting lipoproteins namely Low density lipoproteins (LDL-Cholesterol), Very Low density

lipoproteins (VLDL-Cholesterol) and decreased plasma concentration of High density lipoproteins (HDL—Cholesterol). Hyperlipidemia is always considered being a risk factor for ischaemic heart disease (IHD) and peripheral vascular disease. (4)

It is an established fact that there is a strong association of CAD with high concentrations of LDL-C along with low levels of HDL-C. (5), (6)

Indeed high concentrations of TG also contribute to CAD. The identification of high risk individuals can be done with different combinations of these lipid profile parameters like Atherogenic Index of Plasma (AIP), Castelli's Risk Index I (CRI-I) & Castelli's Risk Index II (CRI-II). (7)

Material and Methods

This is a single case study. Before starting the treatment informed consent was taken from the patient in her own language.

Case Study

A 53 years old female patient presented with tiredness, shortness of breath on exertion, heaviness of the body parts and lack of enthusiasm for the past 4 months associated with occasional giddiness since last month at Kayachikitsa department OPD (OPD No: 3051.) of S.V. Ayurvedic College, TTD, Triupati, AP. on 11-01-2020

* Corresponding Author:

Harinatha Chary B

PhD scholar,

Department of Kayachikitsa,

Parul Institute of Ayurveda,

Parul University, Vadodara, Gujarat. India.

Email Id: drbnchary@gmail.com

History of present illness

Patient was normal before four months. Gradually she developed mild shortness of breath after walking for one kilometer. She was feeling tired even during rest. She was also experiencing heaviness of body parts and lack of enthusiasm. All these symptoms were of four months duration. Since last month she was having occasional giddiness especially in the morning time. Patient was at times experiencing excess sleep. She is neither diabetic nor hypertensive. So, patient visited our hospital.

Personal History

Diet: Mixed diet, Diet pattern: *adhyasana*, Bowel: Regular (1 or 2 times/day), Micturition : 5-6 times/day, Sleep: Normal or excess (occasional), Addictions: No addiction, *Agni: Vishama*, life style: Mostly sedentary, *Rasa pradhana ahara: Madhura*

Occupational History:

House wife

Socio-economic status & Habitat:

Lower-middle class; Urban

On Examination

1. Physical examination

a. Built: Obese, b. Body weight (kg):108, c. height: 157cm d. BMI: 43.8. e. Pulse: 92, f. B.P:140/80mm of Hg. g. Respiratory rate: 20/mt h. CVS: S1, S2 heard. No murmur, i. Respiratory system: Normal, No added sounds

2. Dasavidha pareeksha

1. *Prakruti:Kaphavata*, 2. *Vikruti:Kaphameda*, 3. *Sara:Madhyama*, 4. *Samhanana:Pravara* 5. *Pramana: Pravara*, 6. *Satmya: Madhyama*, 7. *Satva: Madhyama*, 8. *Ahara shakti:Madhyama*, 9. *Vy a y a m a shakti:Avara*, 10. *Vayah:Madhyama*

3. Investigations done:

a. Lipid profile

Lipid profile (12.01.2020) showed TC - 274.2 mg/dl, TG - 356 mg/dl, LDL-C - 175 mg/dl and HDL-C - 28 mg/dl.

b. Thyroid profile

Thyroid profile (12.01.2020) showed T3 – 1.24 ng/dl, T4- 9.63 ng/dl, TSH – 3.56 µIU/ml.

4. Diagnosis: Hyperlipidaemia

Therapeutic intervention

She was advised to take *Sookshma eladi choornam* (8) in a dose of 3 grams with *goghrita* as *anupana dravya*, twice, after morning breakfast and night after dinner for 3 months. After the completion of three months of study again lipid profile was done. Weight and BMI were also observed.

Pathya-apathya:

There was no specific diet schedule advised. The patient was asked to continue her normal routine regular diet.

Results

The results were drawn basing on the below reference values.

According to Adult Treatment Panel III (2001) [2], plasma levels for TC <200 mg/dL, for TG<150 mg/dL, for LDL-C<130 mg/dL, and for HDL-C >40 mg/dL are considered as normal otherwise abnormal.

Atherogenic Index of Plasma (AIP) is calculated as log TG/HDL-C. If the values are from -0.3 to 0.1, indicate low risk, 0.1 to 0.24 with medium risk and above 0.24 with high risk of Caronary vascular disease. Castelli’s Risk Index (CRI-I) is calculated as TC/HDL-C. The values are below 3.5 are considered as ideal and above 5 considered as high risk for cardiovascular disease. Similarly Castelli’s Risk Index (CRI-II) is calculated as LDL-C/HDL-C and the ideal range is below 2 and above 5 considered to be high risk for cardiovascular disease.

Subjective symptoms were graded from 0 to 4.

Table no: 1: Grading of Subjective symptoms

Grading	Shortness of breath (SOB)	Tiredness	Heaviness of body parts
0	No SOB after heavy work	With heavy work for more than 1 hr	Absence of heaviness of the body
1	SOB after heavy work	With heavy work for more than 30 min	Feeling of heaviness of the body after walking for 1 min
2	SOB after moderate work	With moderate work for 15 min	Feeling of heaviness after walking for 30 sec
3	SOB after little work	With mild work for 5 min	Feeling of heaviness after walking for 15 sec
4	SOB at rest	Even at rest	Feeling of heaviness even at rest

Table no: 2: Assessment of lipid profile

Lipid Parameters	BT(mg/dl) (12.01.2020)	AT(mg/dl) (13.04.2020)	FU(mg/dl) (15.5.2020)
Total Cholesterol	274.2	169	163
Triglycerides	356	140	130
LDL Cholesterol	175	102	110
HDL Cholesterol	28	39	27
VLDL Cholesterol	71.2	28	26
TC/HDL Ratio	9.79	4.33	6.03
LDL-C/HDL-C	6.25	2.61	4.07

BT – Before treatment, AT- After treatment, FU- Follow up

Graph no: 1

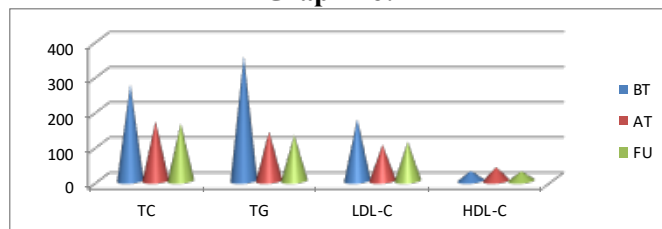


Table no: 3: Assessment of AIP, CRI-I & CRI-II

Parameter	BT	AT	FU
AIP	0.744	0.195	0.323
CRI-I	9.79	4.33	6.03
CRI-II	6.25	2.61	4.07

Graph no: 2

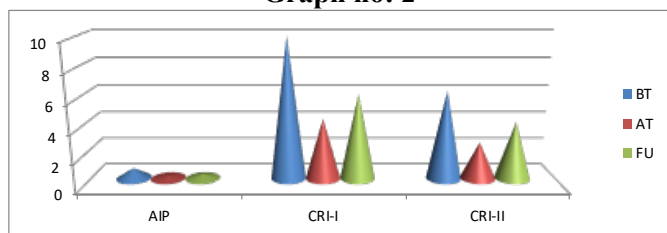


Table no: 4: Assessment of Weight & BMI

Parameter	BT	AT	FU
Weight	108	105	105
BMI	43.8	42.6	42.6

BMI – Body Mass Index

Graph no: 3

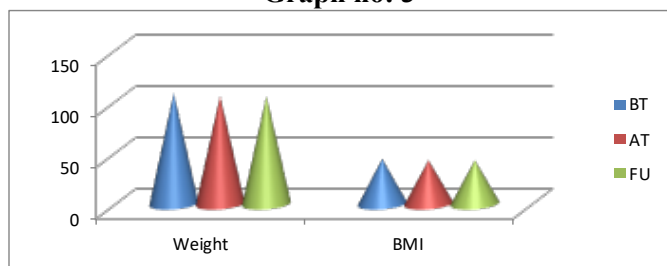
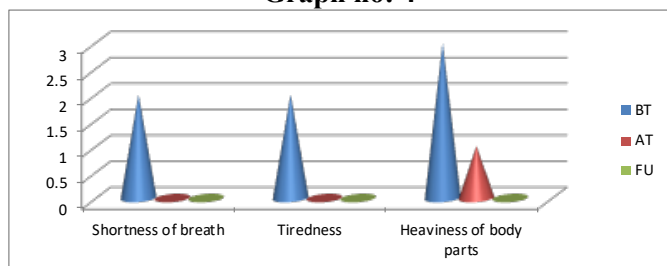


Table no: 5: Assessment of subjective and symptoms

Parameter	BT	AT	FU
Shortness of breath	2	0	0
Tiredness	2	0	0
Heaviness of body parts	3	1	0

Subjective symptoms graded & assessed according to patient relief

Graph no: 4



Discussion

Hyperlipidaemia refers to a condition where there is a presence of increased levels of lipoproteins in circulating blood. According to Ayurveda the pathogenesis of hyperlipidaemia is because of the hypo functioning of *medodhatvagni* along with vitiation of *kapha dosha*. The combination of morbid *kapha* and *medas* in *srotas* may cause *dhamani pratichaya*. In this condition accumulation of *medas* and *kapha* obstructs channels of circulation. *Medus* can be compared to the lipids in the body. Accumulation of *medas* along with

kapha can be compared to the accumulation of fatty plaques in the arterial walls. Hence, this can be compared to atherosclerosis which is a major contributing factor for coronary artery disease. The etiological factors which increase the quantity of *kapha* and *medas* in the body lead to hyperlipidaemia. The patient is obese and her *prakruti* is *Kaphavata*. She indulged in *adhyasana* and used to take more *madhurarasa ahara dravya*. Her weight was 108 kg. She had a habit of excess sleep during day time. All these etiological factors contributed to *kapha-medo vruddi* in the body. As a result, she developed symptoms of *medovruddi lakshanas* like *swasa* (shortness of breath), *alasya* (tiredness), *anga gaurava* (heaviness of body parts). Her lipid parameters were also increased. Many drugs are available in the modern system of medicine to counteract this problem, but the side effects concurring by them are forcing medical science to look for the best solution in alternative system of medicine. Ayurveda advocates a number of *yogas* or formulations which can reverse the pathology of *dhamani pratichaya*. One of them is *Sookshma eladi choornam*. After 3 months of treatment, there is a significant improvement in subjective and objective parameters.

Probable mode of action of *Sookshma eladi choornam*

The ingredients of *Sookshma eladi choornam* are *Sookshma ela* (*Elettaria cardamomum* (L.) Maton) and *Pippali moola* (*Piper longum* L.). These drugs are of *Katu*, *laghu* and *Ushna* in nature. Though *sookshma ela* is *seeta veerya* in nature its *vipaka* is *Katu vipaka*. Hence, both the drugs are *kapha* and *medo haras*. *Goghrita* is *anupana* of *Sookshma eladi choornam*. *Goghrita* multiply the qualities of *ela* and *pippali moola* as it is *yogavahi* in nature. Hence, *Sooskhma eladi choornam* is a unique drug with unique combination and highly effective in reversing the pathology caused by morbid *kapha* and *meda*. This might be the reason for regression or control of abnormal lipids. The AIP, CRI-I, CRI-II indices are also decreased significantly. Thus, there is a decrease in the chance of coronary vascular disease. The subjective symptoms like shortness of breath, tiredness, heaviness of body parts and giddiness were remarkably reduced. It also showed an effect on weight. The patient reduced her weight about 3kg after the treatment. When follow up study was done after one month, there was a little elevation of lipid levels.

Conclusion

From this case study we can conclude that *Sookshma eladi choornam* is a very potent and effective drug in the management of Hyperlipidaemia. No adverse effect was noted and no aggravation of symptoms observed during the whole treatment. It had shown its sustained effect even after one month of follow up. The study with a larger sample would prove *Sookshma eladi choornam* as an effective remedy for hyperlipidaemia.

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