

Role of *Virechana Karma*, *Vidangadi Churna* and lifestyle modification in Metabolic syndrome (*Medoroga*): A Case Study

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Abstract:

Metabolic syndrome is a group of co-morbidities which pose as a risk factor for cardiovascular disease. It comprises of hypertension, central obesity, impaired glucose metabolism and dyslipidemia. It can be considered under broad umbrella of *Santarpaka Nimittaja Vyadhi* and can be managed using *Chikitsa Sutra* for *Santarpanotha Vyadhi*. In present case study, *Virechana* was performed to a diagnosed patient of metabolic syndrome, followed with oral medication *Vidangadi Churna* for 30 days (total duration 45 days). Strict dietary and lifestyle modification including regular physical activity were also suggested to the patient during this period. Patient was assessed on certain symptoms like *Kshudra Shwasa*, *Trisha*, *Atinidra*, etc. together with NCEP ATP III criteria, 2001 before initiation and after the treatment. Symptoms related to *Medodushti* relieved and also body weight (93 to 81 kg), BMI - 25.3- 24.89, FBS- 118.90 - 103.80, Triglycerides- 239.5-105.3, Total Cholesterol-217.2-191.6 mg/dl, LDL-127.3-112.7 mg/dl, VLDL- 47.9-21.1 mg/dl, HDL- 42.0- 57.8, Average blood pressure - 150/ 100 to 130/ 90 mm. of Hg decreased after treatment. *Virechana* and *Vidangadi Churna* accompanied by lifestyle modification are effective in the management of metabolic syndrome.

Keywords: Atherogenic dyslipidemia, Atherosclerotic disease, Cardiovascular disease, *Dhatvagnimandya*, *Medoroga*.

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Introduction:

The metabolic syndrome refers to the co-occurrence of several known cardiovascular risk factors, that increase the early development of cardiovascular disease and type 2 diabetes mellitus. The syndrome comprises of multiple ailments such as elevated blood pressure, impaired glucose tolerance or insulin resistance, atherogenic dyslipidemia (i.e. high levels of triglycerides, low-density lipoprotein particles and low high-density lipoprotein cholesterol), and abdominal obesity. ^[1] These conditions are interrelated and share underlying mediators, mechanisms and pathways. Metabolic syndrome is a serious matter of concern now a days due to the factors like poor dietary habits, sedentary life style and obesity. Nearly 20%–25% of the total adult population all over the world is affected by metabolic syndrome. Study on underdeveloped urban locale of eastern India reported that age standardized prevalence rates of metabolic syndrome were 24.9% in males, 42.3% in females and in overall 33.5%. ^[2] In urban population of India, Metabolic syndrome is more prevalent in 41–60 years age group.

Patients suffering from metabolic syndrome are two to three times more prone to develop cardiovascular disease, five times more to risk of developing diabetes and are at high risk of early death. Early detection of metabolic syndrome is necessary for early identification of patients who are at high risk of developing atherosclerotic disease and type 2 diabetes, to understand the correlation between the pathophysiology of the diseases of metabolic syndrome and their relation with risk of cardiovascular disease. Therefore, there is a need for urgent development of effective approaches for preventing and managing the syndrome. According to the NCEP ATP III definition, metabolic syndrome is present if three or more of the following five criteria are met: waist circumference over 40 inches (men)

or 35 inches (women), blood pressure over 130/85 mmHg, fasting triglyceride level over 150 mg/dl, fasting high-density lipoprotein (HDL) cholesterol level less than 40 mg/dl (men) or 50 mg/dl (women) and fasting blood sugar > 100mg/dl. ^[3]

Agnidushti is the major component in metabolism related disorders. *Kapha Dosha Vridhi* due to lack of exercise/ physical activity, *Divasvapa*, excessive intake of *Madhura*, *Snigdha*, *Guru* or *Kapha Vardhaka Ahara* cause *Agnimandya* (poor digestion/metabolism) in the form of *Dhatvagnimandya*, which is the root cause of *Medovaha Sroto Dushti* results in excessive increase in *Meda Dhatu*. Excessive production and accumulation of *Meda* in the body has been described as *Medoroga*. *Meda Dhatu* simulates fat or adipose tissue. Excessive deposition of *Meda Dhatu* in different parts of body, especially over abdomen cause increase in waist circumference. Aberrantly raised *Medodhatu* in the form of *Abadha Meda* circulates with *Rasa* and *Rakta Dhatu* causing raised levels of lipids, and when it reaches the *Basti* (urinary bladder) in the form of *Kleda* and is excreted with urine causing *Dhatukshaya*, it is referred to as *Prameha* including *Madhumeha*. Deposition of *Abadha Meda* in vessels can lead to a condition *Dhamanipratichaya* (Atherosclerosis), vitiated *Meda Dhatu* may result in *Vyanabala Vaishamya* (hypertension). Obesity creates all conditions of *Medoroga* with *Vyanabala Vaishamya* which simulates with metabolic syndrome. *Acharya Charaka* has also explained *Prameha* and *Atisthoulya* along with other diseases caused by similar etiological factors under *Santarpana-janya Vyadhi*.

Case Report:

A sixty years old obese male patient visited OPD with chief complaints of fatigue, feeling of heaviness, headache, weakness, shortness of breath on mild exertion, excess thirst, lethargy, joint pain, gradual increase in body weight since 3-4 years. Patient was recently retired from a government job (desk work- 6-8 hours). He was strictly vegetarian, had good appetite, fond of milk products and sweets. Patient used to take 4-5 cups of tea a day, no other addiction. He enjoyed sound sleep and slept for 9 hours in night and 2 hours in daytime. He had not undergone any major surgery. In spite of regular monitoring and allopathic medicines his weight was increasing and he had to take regular medicines to keep blood sugar levels and blood pressure in normal range. Patient came to institute's OPD to take Ayurvedic treatment for obesity, raised blood sugar, high blood pressure and raised lipids levels.

Past History:

8 years back, patient was well, gradually he felt weakness in body, higher frequency of urination at night, dryness of throat and headache. He visited allopathic hospital and got his blood sugar and blood pressure checked, and came to know that his blood sugar level and blood pressure was raised. Doctor prescribed him allopathic medicines, till then he was taking antihypertensive, cholesterol lowering and anti-diabetic modern medicines regularly and got his blood sugar and lipid profile checked on regular intervals. Two years before he got an attack of stroke and was hospitalized for 3-4 days. After discharge he felt that left portion of his body became weak in comparison to the right part. There was no past history of prolonged illness. Patient's father, mother and elder brother were also diabetic, hypertensive and obese, father had undergone coronary bypass surgery, died due to cardiac failure 10 years back.

Patient's Examinations:

Body weight was 93 Kg., Height – 169 cm., BMI 32.6 kg/m², Waist Height Ratio- 0.52, Waist Hip Ratio- 37.0, Pelvis 44 cm., Mid-Thigh- 22, blood pressure - 150/ 100 mm Hg, pulse rate- 100/min., Respiratory Rate- 18/min., Pallor- absent, Icterus, Cyanosis, Clubbing- Absent, Tongue- coated. CNS- Conscious, oriented to place, person and time. C.V.S.- S1, S2 Normal, R.S.- No added sounds, Clear chest.

Ashtavidha Pariksha:

Nadi - *Kapha Pradhana*, *Manda Vega*, *Mutra* (Urine frequency) – 4-5 times /day, 2-3 times during night, *Mala* (Bowel habits)- *Krurakoshtha*, *Nirama Mala* (constipated), *Jivha* (Tongue) – *Sama* (Coated), *Shabda* (speech) – *Aspashta*, *Sparsha* (Touch)- *Ushna* (Warm), *Drika* (Eyes)- Normal, *Akriti* (Built) - *Sthula* (Obese), *Prakriti* - *Kapha Pradhana*, *Pitta Prakriti*, *Samhanana*- *Madhyama*, *Satmya*- *Madhyam Satva* – *Madhyam*, *Abhyaharana Shakti*– *Madhyama*, *Jarana Shakti*– *Avara*, *Vyayamashakti* - *Avara* (poor)

Laboratory investigations:

showed elevated serum cholesterol- 217.2mg/dl, Serum LDL-127.3 mg/dl, Serum VLDL- 47.9 mg/dl, Serum Triglycerides- 239.5 and fasting blood sugar-118.90, Grade II fatty liver was noticed in abdominal ultrasonography. His echocardiography was reported normal with LVEF > 60%.

Criteria for assessment:

Patient was assessed on the basis of relief in symptoms like (*Kshudra Shwasa*, *Trisha*, *Moha*, *Atinidra*, *Kranthana*, *Angasada*, *Atikshudha*, *Swedadhikya*, *Daurgandhya*, *Alpaprana*, *Alpamaithuna*)^[4] by using Symptom Rating Scale^[5] and investigations like Lipid Profile, Fasting Blood Sugar, Body weight, Body Mass Index (BMI), circumference of Waist, regular monitoring of blood pressure, before starting the treatment and after 45 days. The patient was diagnosed as a case of *Medoroga* with *Madumeha* and *Vyanavayu Vaishamya* (Metabolic Syndrome)

according to the NCEP ATP III criteria for metabolic syndrome. (waist circumference > 40 inches, blood pressure > 130/85 mmHg, fasting triglyceride level > 150 mg/dl, fasting high-density lipoprotein (HDL) cholesterol level < 40 mg/dl and fasting blood sugar > 100 mg/dl and treatment was planned accordingly.

Treatment Protocol:

Patient had been told about benefits of *Sanshodhana Chikitsa* before oral medicines (Table-1). He had also been advised about the dietary modification like stopping intake of saturated fats, refined carbohydrate, sweetened beverages, over intake of food, day time sleep, sedentary lifestyle and suggested to take of low-fat dairy items like toned milk, avoidance of salted and processed food items, increase intake of green leafy vegetables and fruits and rich fiber diet, performing regular 30 minutes of exercises and about 03-05 Km. of brisk walk (at least 05 days/week).

Vidangadi Churna ^[6]

Contents- *Vayavidanga* (Fruit), *Nagara* (Rhizome), *Yavakshara*, *Lauh Bhasma*, *Yava* (Fruit), *Amalaki* (Fruit) were taken in equal quantity and its fine powder was made. After completion of *Virechana Karma*, *Vidangadi Churna* was given orally in dose of 3gm twice a day with Honey after breakfast and dinner for 30 days.

Follow up and Outcome:

Patient's symptoms were assessed on every 15 days interval during the treatment. Highly Significant improvement was noticed in overall symptoms like *Kshudrashwasa*, *Trishna*, Body weight, Body Mass Index (BMI), BMI Prime, Serum Triglycerides, significant improvement in Total Cholesterol, Serum LDL, Serum VLDL, Serum HDL and Fasting Blood Sugar, blood pressure, No improvement in Waist circumference (Table-2&3).

Table-1: Schedule of Virechana Karma

Steps	Medicine to be used	Duration
<i>Poorva Karma</i>	<p><i>Deepana Pachana</i> with <i>Trikatu Churna</i> (<i>Nagara</i>, <i>Maricha</i>, <i>Pippali</i>) 2gm.twice a day with hot water after meals.</p> <p><i>Snehapana</i> in <i>Arohana Krama</i> with <i>Ghrita</i> (<i>Accha pana</i>) in morning. 6.30 a.m., empty stomach with lukewarm water.(till <i>Samyaka Snigdha Lakshanas</i> (<i>Udgara Shudhi</i>, <i>Laghutva</i>, <i>Malshudhi</i>, <i>Snehavirakti</i> etc. were obtained)</p> <p><i>Abhyanga</i> with <i>Tila taila</i>, followed by <i>Swedana</i>.</p>	<p>5 days (Oral) until <i>Nirama Lakshana</i> (good appetite) was obtained.</p> <p>5 days (Oral)</p> <p>Ist Day- 30 ml. (after assessing <i>Agnibala</i>)</p> <p>IIInd Day- 60 ml.</p> <p>IIIrd day- 100 ml.</p> <p>IVth Day- 150 ml.</p> <p>Vth Day-200ml.</p> <p>3days with <i>Laghu Ahara</i></p>
<i>Pradhana Karma</i>	<i>Virechana</i> with <i>Abhayaadi Modaka</i> 6 tablets (250 mg. each) in morning at 9 a.m with cold water after <i>Snehana</i> and <i>Swedana</i> ..	1day (Oral), take <i>Munakka Sadhita</i> cold water repeatedly, don't sleep or sit under fan or expose to strong winds or sunlight during procedure, attend the urge of defecation.

Assessment of patient	Vitals Examination- BP, PR, RR. Symptoms of proper purgation <i>Kshudha Pravritti</i> , stopping of purgation on its own, amount of stool, passing of stool with white mucous or discharge in last one or two motions, feeling of lightness in the body.	Virechana Vega Time of initiation of - 11 AM Time of Stoppage - 4 PM Total number - 18
<i>Paschaat Karma</i>	Samsarjana Krama- 1. <i>Mand</i> 2. <i>Peya</i> 3. <i>Vilepi</i> 4. <i>AkritaYusha</i> 5. <i>KritaYusha</i> 6. Normal Diet followed	2 <i>Anna Kala</i> (in 1 day) 2 <i>Anna Kala</i> 2 <i>Anna Kala</i> 2 <i>Anna Kala</i> 2 <i>Anna Kala</i>

Table-2: Effect of Treatment on subjective symptoms:

Parameters	Grade (before treatment)	Grade (after treatment)	percentage Relief
<i>Kshudrashwasa</i>	2	0	100
<i>Trisha</i>	3	0	100
<i>Moha</i>	3	0	100
<i>Atinidra</i>	3	0	100
<i>Kranthana</i>	3	0	100
<i>Angasada</i>	3	0	100
<i>Atikshudha</i>	3	0	100
<i>Swedadhikya</i>	4	1	75
<i>Daurgandhya</i>	3	0	100
<i>Alpaprana</i>	3	0	100
<i>Alpamaithuna</i>	3	0	100

Table -3: Effect of Treatment on obesity parameters and Laboratory Investigations

Investigations	Before Treatment	After Treatment	% Relief
Body Weight	93 kg	81 kg	12.9
BMI	32.6 kg/m ²	28.4 kg/m ²	1.62
Waist Circumference	41.5 inches	42 inches	-0.5
Average Blood Pressure	150/100 mm. of Hg	130/ 90 mm. of Hg	
Fasting Blood Sugar	118.90 mg/dl	103.80 mg/dl	15.10
Serum Total Cholesterol	217.2 mg/dl	191.6 mg/dl	13.36
Serum Triglycerides	239.5 mg/dl	105.3 mg/dl	56.07
Serum LDL	127.3 mg/dl	112.7 mg/dl	12.95
Serum VLDL	47.9 mg/dl	21.1 mg/dl	127.01
Serum HDL	42.0 mg/dl	57.8 mg/dl	15.8

Discussion:

Virechana proved effective in subjective symptoms, body weight, BMI, Lipid profile and fasting blood sugar levels due to the fact that, *Virechana Karma* had been described in the treatment of *Santarpana Nimittaja Vyadhi* by Acharya Charaka.^[7] It is considered as best *Sanshodhana Karma* in *Pittanubandhita Kapha* for eliminating *Pitta* with *Bahu Drava Shleshma*, *Bahu Abadha Meda*, by virtue of *Rechana* and *Sramsana Karma* and thus removing the *Avarana* to *Vata* leading to clearing of *Srotasa*. Significant reduction in fasting blood sugar was possible by *Virechana*, as it stimulated liver and pancreas to secrete more amounts of intestinal secretin and Cholecystokinin enzymes that helped in reducing hyperglycaemia without altering in post prandial insulin. *Virechana Karma* corrected *Agni*, normalized the function of intestine and liver and thus prevented the production of triglyceride and total cholesterol. *Virechana Karma* stimulated the gall bladder to produce and excrete large amount of bile, which indirectly helped in the excretion of cholesterol. The site of action for *Virechana Karma* was *Adho Amashaya* (small intestine) from where the cholesterol could be reabsorbed. It helped to convert the cholesterol in the non-absorbable form to prevent its reabsorption.^[8]

The significant reduction in body weight, BMI due to *Virechana Karma* could be explained as, it induced the secretion of hormones like peptide, pancreatic polypeptide, glucagon-like peptide, CCK 37 etc. in gut by stimulating the pancreas and liver leading to contraction of gallbladder. These hormones aimed at sending signals for food intake to the brain. Raised levels of these hormones control the activity of gut- brain axis and adjusted the appetite equilibrium, thus helped to manage weight.^[9] In *Virechana Karma*, primarily vitiated *Doshas* present at the plasma and tissue level (bad

cholesterol), were brought from the peripheral tissues to the intestine by proper *Snehana* (*Abhyantara* as well as *Bahya Snehana*) and *Swedana* (*Purva Karma*), have been brought to the intestine for the excretion by therapeutic purgation. *Abhayadi Modaka*^[10] was used as main *Virechaka* (medicine for purgation) in the study. Most of the drugs in *Abhayadi Modaka* had “*Ushna*, *Tikshna* properties with *Adhobhaghara Prabhava*”.

Medoroga is a *Kaphapradhana-Medopradoshaja Vikara* having *Medavritta-Vata*. So, for *Samprapti Vighatana*, *Dravya* having properties opposite to *Meda-Kapha*, i.e. *Laghu*, *Ushna*, *Ruksha*, *Katu* and *Lekhana*, properties were selected. *Vidangadi Churna* proved effective due to its *Medo-Vatahara Pravabha*. *Vidangadi Churna* contained *Vayavidanga*, *Nagara*, *Yavakshara*, *Lauh Bhasma*, *Yava*, *Amalaki* in equal quantity in powder form. Due to *Katu Rasa Pradhanata* it was helpful in *Samprapti Vighatana* of *Medoroga* (*Vyadhipratyanika Chikitsa*).

Vayavidanga - *Vayavidanga* has been described by Acharya Charaka in perspective of *Atisthoulya*. *Vidanga* acted by its *Prabhava*.^[11] Due to the presence of a major bioactive component and a quinone derivative named embelin, it proved to be antihyperglycaemic, anti-hypertensive, anti adipogenic. Preclinical studies on *Vayavidanga* has proved its effectiveness in alleviating adiposity and dyslipidemia. The combination of *Yava* and *Amalaki* being *Madhura Vipaka* and *Sheeta Virya* fulfilled the criteria of *Guru evam Aptarpana Chikitsa* stated as best treatment for *Medoroga*.

Yava - *Yava* by virtue of *Guru* and *Pichhila Guna*, high content of water soluble fiber (3.9%) helped in *Srotovishodhana*, difficult in digestion, helped to alleviate excess *Agni* in *Kostha*, controlled appetite, as a result energy uptake and absorption of fat decreased, affected enteric reabsorption of cholesterol, thereby reduced the cholesterol level and

helped in rapid clearance of stored fat, hence proved suitable in obesity as daily food. Due to *Purisha Krit* property it facilitated elimination of excess fat out of the body in bulk with stool. [12]

Amalaki - Studies on *Amalaki Churna* proved that *Amalaki Churna* could be consumed on daily basis as food supplement in dyslipidemia. Due to *Sheeta Virya* it pacified *Jatharagni* thereby reducing appetite. Different types of tannins present in it helped in maintenance of micronutrient level in the body. [13]

Loha Bhasma- Due to antihyperlipidemic action, aqueous extract of *Trayushanadi Loha* showed a noticeable reduction in the levels of serum cholesterol and triglycerides.

Shunthi (*Zingiber officinale*)- Due to *Kaphvatahara*, *Deepana*, *Pachana* properties *Shunthi* performed hypolipidaemic and antiatherosclerotic, antidiabetic and cardiogenic activities.

Yavakshara- *Yavakshar* having *Kledahar*, *Chedana*, *Kaphanissaraka* properties caused irritation in intestinal epithelium thereby stimulating more excretion of *Malarupi Abadha Meda* (lipids) in stool, and also prevented reabsorption of fats, promoted scrapping (*Lekhana*) of lipids in blood vessels, reduced *Sandrata* (density) of the blood and prevented fat deposition in blood vessels (atherosclerosis), a major risk factor of CHD [14]

Conclusion:

Marked improvement was noticed in the overall symptoms, Body Weight, BMI, Lipid Profile and Fasting blood Sugar of the patient after *Sanshodhana* by *Virechana*, *Sanshamana Chikitsa* (*Vidangadi Churna*) and lifestyle changes.

Declaration of patient consent:

Authors certify that they have obtained patient consent form, where the patient/caregiver has given his/her consent for reporting the case along with the images and other clinical information in the journal. The patient/caregiver understands that his/her name and initials will not be published and due efforts will be made to conceal his/her identity, but anonymity cannot be guaranteed.

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