REVIEW ARTICLE

ROLE OF LEEKHANA BASTI IN THE MANAGEMENT OF METABOLIC SYNDROME – A REVIEW

PRIYANKA SHARMA¹ ALOK KUMAR SRIVASTAVA² SHASHI KANT TIWARI³ PARUL SHARMA⁴

ABSTRACT

Metabolic Syndrome is a complex metabolic disorder and an emerging clinical challenge in society as 11% - 41% Indians and around 1 out of 4 adults worldwide are suffering from this syndrome. It is associated with the development of CVD, Type 2 DM and other life threatening problems. It arises due to fatty rich diet, sedentary lifestyle, stress, excessive alcohol, overweight, age etc. It is clinically recognized when at least 3 out of 5 biochemical and physiological abnormalities like visceral obesity, dyslipidemia, hypertension, raised blood sugar, insulin resistance etc are found in the body. Acharya Charaka has mentioned a group of diseases namely santarpana nimittaj vikara (diseases due to over nutrition) which can be symptomatically co-related with Metabolic Syndrome. Treatment offered by modern science does not deal with the removal of harmful metabolites created in the body during the development of diseases. Ayurvedic treatment like lekhana basti (medicated enema) emphasize mainly in the removal of vitiated doshas (three humours-vata,pitta,kapha)and cleansing congested srotas (channels) helping in removing harmful metabolites from the body which not only prevents but also uproots the cause which may further manifest into more complicated conditions.

Key words: Metabolic Syndrome, santarpana nimittaj vikara, lekhana basti

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INTRODUCTION
In recent years Metabolic Syndrome is gaining too much importance because of its complex etio-pathogenesis, clinical presentation, management and major complications. It consists of various components which are result of defective metabolism and increases the risk of Coronary Artery diseases and Diabetes Mellitus \(^1\). It is a major health hazard in the developed countries and gradually accruing its place in developing countries too, which leads to other hazardous complications such as Chronic Artery Disease, Chronic Kidney Disease, Non Alcoholic Fatty Liver Disease and Poly Cystic Ovarian Disease etc \(^2\). Initially Metabolic Syndrome was known as Syndrome X or Insulin Resistance syndrome \(^3\). Syndrome X was the name proposed by Reaven (1988) in a lecture of the American Diabetes Association \(^4\). The sedentary life style and unhealthy food habits contributes a lot in rising rates of obesity, which is a major contributor to develop Metabolic Syndrome \(^5\).

Disease review (modern):
Metabolic Syndrome is clinically recognized when at least 3 out of 5 biochemical and physiological abnormalities like visceral obesity, elevated triglycerides, dyslipidemia, hypertension, raised blood sugar, insulin resistance etc are found in the body and collectively share some common signs and symptoms like belly fat, fatigue, breathlessness, polyuria, high appetite etc. In Metabolic Syndrome different diseased conditions arise due to disturbed metabolism of lipids esp. FFA (free fatty acids) which further affects functioning of liver, pancreas, kidneys, heart and worsening the biochemistry of blood by increasing the level of VLDL, LDL, TGL, glucose insulin, endocrine secretions of triglycerides like TNF, interleukins etc. Many definitions of Metabolic Syndrome have been proposed from time to time. But the most widely accepted definition worldwide is of the NCEP ATP III. According to this definition, a subject has Metabolic Syndrome if he or she has three or more of the following criteria \(^6\).

1. Abdominal obesity: WC ≥102 cm in men and ≥88 cm in women
2. Hypertriglyceridemia: ≥150 mg/dl (1.695 mmol/l)
3. Low HDL-C: <40 mg/dl in men and <50 mg/dl in women
4. High blood pressure (BP): >130/85 mmHg
5. High fasting glucose: >110 mg/dl

Subsequently, the NCEP ATP III has also suggested that the fasting plasma glucose concentration for diagnosing Metabolic Syndrome be lowered to 100 mg/dl \(^7\). Researchers worldwide preferred using the NCEP ATP III definition because it was relatively simple and clinically applicable.
Ayurvedic review:
The classical Ayurvedic texts have vividly described *santarpana nimittaj vikara* comprising diseases due to over nutrition and defective tissue metabolism seem to have similarity with Metabolic Syndrome. Following table shows aetiopathogenic factors of Metabolic Syndrome.

Table 1: The *samprapti ghataka* (aetiopathogenic factors) of Metabolic Syndrome[^8].

| *dosha* | predominantly *kapha* (mainly *kledaka*)  
|---------|------------------------------------------  
|         | *pitta* (mainly *pachaka*)                
|         | *vata* (mainly *samana* and *vyana*)     |
| *dushya* | *rasa*, *rakta*, *mamsa*, *meda*, *majja*, *shukra* and *oja* (mainly *meda*) |
| *Agni* | *medodhatu agramandya*              |
| *srotas* | *rasavaha*, *maktavaha*, *mamsavaha*, *medovaha*, *majjavaha* and *shukravaha* (mainly *medovaha*) |
| *strotodushthi* | *sanga*, *vimarga gamana*, *Atipravritti* |
| *adhishtana* | *sarva shaira* |
| *ubhavasthana* | *Amashaya* |
| *prasara* | *rasayani* |
| *Ama* | *dhatvagni mandata janya* |

In the pathogenesis of Metabolic Syndrome, *agni* (biochemical transformers) plays a very important role since beginning to the end. In the cases of Metabolic Syndrome, *agni mandata* (slow digestion) especially at the level of *medo dhatu* (adipose tissue). *Agni* is the root cause of Metabolic Syndrome. *Dhatvagni* are seven in numbers. Each one is located in its specific dhatu to permit its moieties from the circulating substances derived after *bhutaagni paka* (digestion) to form its own tissue. In the process of *dhatvagni paka* (metabolic transformation)) *asthayi dhatu* (mobile or non-static, meant to nourish) or *sthayi dhatu* (fixed, already formed and existing) are formed. Metabolic Syndrome is caused by the excessive intake of *madhura ahara* (food with sweet taste) *snigdha ahara* (fat rich diet), *adhyashana* (eating before digestion of previous food) and sedentary life style etc. Due to these *nidana* (causes), as *ahara* (diet) taken is not properly digested. This may lead to formation of *ama* (un-metabolized food) i.e. a reactive species. This form of *ama* is distributed all over the body with *ahara rasa* and mainly increases the *sama meda dhatu* (visceral adiposity) because of its excessive unctuous and sweet nature. This *ama* formation suggests that there is *dhatvagni mandata* (slow tissue metabolism) at the level of *meda dhatu*. It is pointed out by Dalhana and
Chakrapani in their commentaries on Sushruta Samhita that formation of ama need not necessarily be due to the jatharagni mandata (weak gastrointestinal metabolism) only and it may also occur due to impairment of dhatvagni vyapara (tissue metabolism) [10]. Following flowchart shows pathogenesis of Metabolic Syndrome-

![Pathogenesis of Metabolic Syndrome](image)

**Management:**
In Modern medical science—moderate calorie restriction, fiber rich diet, increase in physical activity and quitting addiction (smoking & alcohol) is followed as primary intervention in treating metabolic syndrome. Further symptomatic drug therapies are used to pacify different diseased conditions like antihypertensive drugs for hypertension, cholesterol reducing drugs, anti-diabetic drugs, Liposuction for removing subcutaneous fats etc. Treatment offered by modern medical science does not deal with the removal of harmful metabolites that are created in the body during the development of diseases.
Acharya Charaka and Shushruta described the treatment for santarpana nimittaj roga by samshodhana (purification and cleansing) procedures like lekhana basti, medicines, dietary changes and exercise[11], [12]. Ayurvedic treatment includes nidana parivarjana (removal of cause) and use of drugs for the treatment of santarpana nimittaj roga like modern medicines but the main difference is in the concept of removal of doshas and cleansing congested srotas which in turn helps in removing harmful chemical metabolites from the body. Lekhana basti is an important samshodhana karma in the treatment of Metabolic Syndrome.

Lekhana Basti:
The word lekhana (scraping) itself indicates its action means - "lekhanam patlikaranam". "lekhanam karshanam"[13]. Thus lekhana is nothing but a process of emaciation while Sarangadhara considered lekhana in a wide sense i.e. Lekhana is a process of drying up or desiccation of all excess dosha, dhatu and mala i.e. "deha vishosanam"[14]. "Dhatun - malan va dehsya vishoshya lekhayechha yat lekhanam"[15]. That means the drug which rarifies the protoplasmic contents of tissue cells and thus gradually clears the system of its deranged constituents is known as lekhana. This basti is prepared by following the method of asthapana basti. Ingredients of lekhana basti are taken from Sharangdhar Samhita which comprise of triphala kwatha, gomutra, honey, yavakshara and ooshakadi gana[16].

DISCUSSION:
Many works have been done on lekhana basti in obesity, hyperlipidaemia etc but not much work has been done on the role of panchakarma (the five cleansing procedures) therapies in Metabolic Syndrome.

Chaturvedi A, Rao PN, Kumar MA, Ravishankar B, Rao N, Ravi M.et al conducted a study on Wistar strain albino rats entitled “Effect and mechanism of virechana karma (therapeutic purgation) over fructose-induced Metabolic Syndrome: An experimental study. They found virechana karma to be effective in the management of Metabolic Syndrome[17]. Chaudhary Nidhi conducted a clinical trial on 30 patients with two sittings of virechana entitled” Clinical evaluation of virechana in management of Metabolic Syndrome” and she concluded that virechana had significant effect in the management of Metabolic Syndrome[18].

As far as lekhana basti is concerned, Auti S. Swapnil, Thakar B. Anup, Ravishankar B. et al conducted a clinical trial on 22 patients of hyperlipidemia entitled “Assessment of lekhana basti in the management of hyperlipidemia “which were divided randomly into two groups (lekhana basti group and standard control group). The trial was conducted for 21 days and it was concluded
that lekhana basti had significant effect in reducing the symptoms of medo dushti and in reduction of objective parameters like weight, body mass index (BMI), body circumferences etc [19].

Another clinical trial entitled “Lekhana basti: an alternative for Bariatric Surgery” was conducted by Gupta Arun, Sharma Pushpa, Kajaria Divya et al. They selected 10 patients of obesity and administered them with udvartana and lekhana basti (kala basti - 6 nirooha basti and 10 anuvasana basti schedule) in 2 sittings with one month gap in between. It was concluded that lekhana basti produced significant result in both subjective and objective parameters of obesity [20].

Sreelakshmi Chaganti, Kumari Shylaja R., Sanpeti V. Rajashekhar, Dasari Srilakshmi et al conducted a single blinded randomized controlled study entitled “Evaluation of efficacy of ooshakadi lekhana basti in hyperlipidemia-A single blinded randomized controlled study” on 45 hyperlipidemic patients divided into three groups, (a) kalabasti- in patients associated with obesity, (b) kalabasti in those not associated with obesity, (c) those with or without obesity administered with antihyperlipidaemic drug atorvastin. It was found that, ooshakadi lekhana basti is effective in hyperlipidemia and more efficacious in the group of non-obese hyperlipidemic patients [21].

Nisargi Ramachandra, Pathak Pankaj, C R Mythrey et al conducted a clinical trial on 22 patients entitled “The effect of lekhana basti in the management of sthoulya” It was a randomized controlled single blinded study with two groups, (a) lekhana basti (kala basti schedule), (b) standard control group. It was concluded that lekhana basti has a significant role in reducing BMI, VLDL cholesterol and triglyceride level [22].

All the above mentioned studies prove lekhana basti to be highly efficacious in obesity and hyperlipidemia. As these are the key components of Metabolic Syndrome, lekhana basti would be highly effective in Metabolic Syndrome too.

In this article, the role of lekhana basti on Metabolic Syndrome is being described.

Table 2: Drugs used in lekhana basti
<table>
<thead>
<tr>
<th>Name</th>
<th>Rasa</th>
<th>Guna</th>
<th>Virya</th>
<th>Vipaka</th>
<th>Karma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haritiki (Terminalia chebula)</td>
<td>kashya, tikta, madhura katu, amla</td>
<td>laghu, ruksha</td>
<td>ushna</td>
<td>madhur</td>
<td>tridoshshamak Esp. vata</td>
</tr>
<tr>
<td>Bibhitak  (Terminalia bellerica)</td>
<td>kashya</td>
<td>laghu, ruksha</td>
<td>ushna</td>
<td>madhur</td>
<td>tridosh shamak Esp, kaph</td>
</tr>
<tr>
<td>Amalaki (Emblica officinalis)</td>
<td>amla, madhur, tikta, kashya, katu</td>
<td>guru ruksha sheeta</td>
<td>sheeta</td>
<td>madhur</td>
<td>tridoshshamak Esp.pitta</td>
</tr>
<tr>
<td>Goumutra</td>
<td>katu, tikta, kashya, lavana, madhur</td>
<td>tikshana ushana</td>
<td>ushna</td>
<td>Katu</td>
<td>vata kapha shamak pitta prakopak</td>
</tr>
<tr>
<td>Madhu (Honey)</td>
<td>madhurkashya</td>
<td>guru ruksha</td>
<td>sheeta</td>
<td>madhur</td>
<td>Tridoshhara</td>
</tr>
<tr>
<td>Yavakshar</td>
<td>katu</td>
<td>laghu, snigdha</td>
<td>ushna</td>
<td>Katu</td>
<td>kaph vatta shamak</td>
</tr>
<tr>
<td>Kasis</td>
<td>amlatikta</td>
<td>Laghu</td>
<td>ushna</td>
<td>Katu</td>
<td>kaph vatta shamak</td>
</tr>
<tr>
<td>Ferrous sulphate</td>
<td>Ferula narthex</td>
<td>Laghu</td>
<td>snigdha</td>
<td>tikhna</td>
<td>kaph vatta shamak</td>
</tr>
<tr>
<td>Saindhav lavana Rock salt</td>
<td>lavana</td>
<td>Laghu rooksha</td>
<td>sheeta</td>
<td>madhur</td>
<td>tridoshhara</td>
</tr>
<tr>
<td>Shilajatu</td>
<td>tikta</td>
<td>guru</td>
<td>sheeta</td>
<td>Katu</td>
<td>kaph shamak</td>
</tr>
</tbody>
</table>

**Mode of action of lekhana basti:**

The drugs used for the preparation of lekhana basti possess gunas (qualities) like katu (pungent), tikta (bitter), kashaya (astringent) rasa, laghu (light), ruksha (dry) and tikshna (sharp/pungent) guna, ushna (hot) virya (potent energy), katu vipaka (post digestive effect), lekhana (scrapping), kaptha vata hara, deepana (appetizer), pachana (carminative) and stroto shodhaka (channel clearing) properties.[23] Lekhana basti works on whole body after entering into pakvashaya (large intestine) or guda (rectum and anus). Guda is said as sharira mula (base of the body) having shiras (blood vessels) and dhamanis (arteries), which spreads all over the body. Basti dravya normalize apana vata (vata governing downward movements especially excretion) making it to function normal. It also enhances the function of purisha (stool). One of the functions of purisha is ‘anila anala dharana’, thus basti leads to correction of agni dushti (improper functioning of biochemical transformers). As metabolic syndrome is mainly due to agni dushti, lekhana basti helps in pacifying it’s symptoms by correction of agni dushti. As per modern appraise, the intestines are highly innervated. The basti drugs stimulate the specific receptors present in the intestines which activate the autonomic nervous system and send signals to the brain. This helps in removal of morbid doshas and excessive fat. The multidimensional actions exerted by the basti are due to the usage of various
combinations of drugs [24]. The specific formulation called “ooshakadigana dravya “mainly possesses katu, tikta, kashaya rasa ,ushna, tikshna, laghu, rooksha gunas are the inherent qualities with ushna virya and katu vipaka. These properties are tejo guna pradhana (mainly fire element) and are understood to act at the level of jatharagni enhancing the dhatvagni (metabolism). Thus the formation of ama rasa is avoided and sequential formation of rasa, rakta is achieved resulting in decreased production of medodhatu. Further it will not cause the avarana (occlusion) of vata which will not cause increased appetite which is usually set-in due to jatharagni deepti. Hence avoiding the patient in indulging in the causative factors. The kshara guna (alkaline property) effect of gomutra, yavakshara is increased by the synergistic effect of ooshakadi gana drugs as they also possess similar properties. The complete and final product of lekhana basti is a hyper tonic solution. After entering in the large intestine it creates the osmotic pressure gradient, favoring the body fluids transfer from hypotonic to hyper tonic solutions along with toxic materials like LDL cholesterol. This phenomenon preferably helps to drag the toxins (unwanted metabolites) from inter intra cellular levels to large intestine and are eliminated out of body. This LDL cholesterol has the affinity for toxins and thus becomes harmful in the body. Rectum being rich in vasculature and the unique preparations of lekhana basti yoga, the drugs are absorbed and cross the rectal mucosa through selective permeability. The major active principles present in the above formulation are of alkaline nature. This normalizes physiological PH of rectal mucosa facilitating for growth of bacterial flora which results in the stimulation of enzymes for the proper metabolism of cholesterol. Most of the ingredients used in the formulation have been screened for antihyperlipidaemic activities. As mentioned above it is proposed that the drugs absorbed either reaches portal circulation through superior haemorohoidal veins from upper rectal mucosa or directly enters into the systemic circulation through middle and inferior rectal veins from lower rectal mucosa. These active principles that reaches liver, stimulates production of bile salts resulting in regularization of emulsification of fats thus avoiding fatty accumulation in liver and in blood cells. The active principles directly entering in to circulation reduces the sandrata (density) of blood by scraping the lipids in blood vessels with their alkaline property. Thus avoids the narrowing of arteries (atherosclerosis) which is major risk factor of CHD. Large intestine contains maximum number of nerve plexuses and lumbo sacral plexus that spread all over the body. Vata
*dosha* is considered to be the entity of functions performed by the above plexuses in the present context. Here by the virtue of *basti* treatment *vata* is channelized, causing stimulation of particular endocrine glands to release their enzymes like pancreatic lipase, acetyl-a coenzyme which are responsible for metabolism of lipids. *Basti dravyas* are absorbed into *sira* or *rasayani* (channels) that generally carries *rasa* (*plasma*) along with *rakta* (blood). The increased *meda dhatu* also goes to *deha sanchari* (travel all over the body) through these *sira* and *rasayani*. It is perceived as increased lipids circulating through *rasa* and *rakta*. Hence the drugs administered in the form of *basti* have effect even on *rakta dhatu* which is having the increased circulating lipids [25].

**CONCLUSION:**

From the above discussion we can conclude that *lekhana basti* is an important *samshodhana* procedure which plays a key role in removing harmful disease causing metabolites from the body, hence pacifying the symptoms of Metabolic Syndrome by cleansing the *strotas* of the body.

**REFERENCES:**


8) Tiwari K Shashi. Characterization of the urine of patients of Metabolic Syndrome and Prediabetics and its correlation with Different Types of *Prameha*:


16) Bramhanand Tripathi (editor). Commentary: Dipika of Sharangdhar Samhita of Sharangdhar, Uttar Khand, chapter 6, verse no.21, 1st edition, Varanasi: Chaukhambha Surbharati Prakashan; 2011; 239


18) Chaudhary Nidhi. Clinical evaluation of *virechana* in management of Metabolic Syndrome, MD Thesis; Dept. of Panchakarma; Rishikul campus, UAU; 2016


23) Siddhinanda Mishra (editor). Commentary: Bhaishajya kalpana Vijnanam, chapter-Aushada
kalpana/Kwatha Kalpana, 1st edition, Varanasi: Chaukhambha Surbharati; 2007; 126-128


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