

## **ROLE OF VIRECHANA IN METABOLIC SYNDROME WSR TO DYSLIPIDEMIA- A CONCEPTUAL ANALYSIS**

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### **ABSTRACT**

Metabolic syndrome is cluster of associated symptoms composed of impaired fasting glucose, abdominal obesity, hypertension and dyslipidemia. It is also associated with cardiometabolic risk factors associated with increased risk of multiple chronic diseases, including cancer and cardiovascular disease. The increased amount of visceral fat together with a chronic inflammatory state predisposes to the development of arteriosclerosis leading to further arterial complications like TAO and arteritis.

Metabolic Syndrome is a complex of clinical conditions caused by Santarpanakaraka Nidana leading to Medodushti. Pittadosha is responsible for inflammatory process (Shopha) in the affected Medo dhatu. Moreover Atisweda, Ati kshudha, Atipipaasa, Paka, Angagandha are also mentioned as Pitta vikaras which are also features of Medodushti. Santarpana karaka Nidanas like Snigdha Madhura Guru Pichhila Ahara, Navaanna, Aanoopa Mamsa, Diwaswapna, Avyayama will lead to the diseases like Prameha, Pidaka, Kotha, Kandu, Pandu Jwara, Kushta, Atisthoulya, Gurugatrata and so on. It is stated that the Rasa dhatu enriched with the qualities like Ati Snehamsa and Madhuratara Guna produces excess Medo dhatu and causes Sthoulya.

To alleviate this Vaikarika Pitta, Meda, Kapha and Vata dosha together Virechana is the treatment and it is the treatment of choice for Pitta dosha as well as inflammatory conditions.

Virechana by means of acting directly on the Dushta medo dhatu, reducing inflammation and also corrects the metabolic process in the Dhatu.

**Key words:** Metabolic Syndrome, Dyslipidemia, Inflammation, Medoroga, Virechana,

## **INTRODUCTION:**

Major health problems globally are Obesity and Metabolic syndrome. Large amount of fat deposited around the visceral organs, otherwise known as visceral adiposity is the major factor for manifesting metabolic disorganization and even cardiovascular diseases<sup>1</sup>. Metabolic syndrome is not a disease in itself. Instead, it's a group of risk factors that include high blood pressure, high blood sugar, higher cholesterol levels, low HDL and excess abdominal fat. The metabolic error that is initiated due to wrong food habits, lifestyle, sedentary life, physical inactivity, excessive physical and mental stress lead to establishment of morbidity in various components of the body, finally makes the person land up in severe complications also.

## **AIMS AND OBJECTIVES:**

In the article, an attempt is made to analyze the altered state of metabolism of Medodhatu that leads to manifestation of various resultant disorders. An analysis is made to understand the effect of Santarpana in causing Medodushti.

A review is made on Virechana Karma and its applicability in various conditions of altered metabolic states and in Metabolic Syndrome.

A diligent review and a critical analysis of the literature and research outcomes is attempted to state the Virechana Karma is beneficial in reducing the morbid factors involved in Metabolic Syndrome and also the mode of action of the procedure in correcting the metabolic errors to the possible extent.

## **METABOLIC SYNDROME AND MEDOROGA :**

The term Metabolic syndrome is a group of symptoms that includes impaired fasting glucose, abdominal obesity, hypertension and dyslipidemia. It is also associated with cardiometabolic risk factors associated with increased risk of multiple chronic diseases, including cancer and other occlusive and inflammatory disorders of the vessels.<sup>2</sup> The excessively deposited amount of visceral fat together with a chronic low grade inflammatory state predisposes to the development of arteriosclerosis manifesting into further arterial

complications like TAO, arteritis, etc<sup>3</sup>. Metabolic syndrome is not restricted to vessels or fat, it is also connected with development of fatty liver diseases, endocrine dysfunctions and psychiatric disorders<sup>4</sup>.

### CRITERIA FOR DIAGNOSIS OF METABOLIC SYNDROME:

The diagnostic criteria for metabolic syndrome are not universal. Even if one is diagnosed with metabolic syndrome, a patient only receives recommendations to improve lifestyle habits such as meals and exercise; medication or surgical treatment is not carried out immediately<sup>4</sup>

The WHO (1999) criteria require the 1. Presence of any one of these, (i) diabetes mellitus, (ii) impaired glucose tolerance, (iii) impaired fasting glucose or insulin resistance, and two of the following criteria defined below<sup>5</sup>:

- Blood pressure: > 140/90 mmHg
- Dyslipidemia: triglycerides (TG): > 1.695 mmol/L and highdensity lipoprotein cholesterol (HDL-C) < 0.9 mmol/L (male), < 1.0 mmol/L (female)

- Central obesity: in male waist: hip ratio > 0.90; in female waist: hip ratio > 0.85, or body mass index > 30 kg/m<sup>2</sup>
- Microalbuminuria: urinary albumin excretion ratio >20 µg/min or albumin: creatinine ratio > 30 mg/g

### CONCEPT OF SANTARPANA VIKARAS AND MEDOROGA:

The concept of Medoroga is detailed narration in the Brihatrayees under the broad spectral heading of Santarpana janya vikaras. **Medorogah – Medodhatu dushti janya rogah**<sup>6</sup>. Medoroga means the cluster of disorders manifested as a consequential of altered and affected metabolism of Medodhatu. It is so mentioned in the classics that the MedovahaSrotas that represents or carries Medodhatu gets affected as a result of excessive indulgence in the following factors like Avyayama- physical inactivity, Divaswapna- sleeping during the hours between the sunrise and sunset, Medya ahara ati bhakshana- consumption of fat and calorie rich diet and also Varuni madya sevana- consumption of a specific variety of alcoholic beverage called Varuni Madya<sup>7</sup>.

Thus manifested disorders of altered and affected metabolism of various body factors especially due to excessive unhealthy nourishment are considered as Santarpana janya vikaras<sup>8</sup>. The list of Santarpana janya vikaras as mentioned in the classical text books includes – Prameha, Prameha pidaka, KoTHa, Kandu, Pandvamaya, Jwara, Kushta, Visuchika like Ama pradoshaja vikara, Mutra kricchra, Arochaka, Tandra, Klaibya, Atisthoulya, Alasya, Guru Gatrata, Indriya lepa, Sroto lepa, Buddhi Moha, Prameelaka, Shopha<sup>9</sup>. Medoroga is an example at par for such disorder established as a result of Santarpana<sup>10</sup>. Lack or minimum of physical activity, sedentary/sophisticated life style, lowered physical and mental endurance, erratic, unhealthy eating habits; physical and mental stress, excessive and repeated hormonal inductions, alcohol consumption, smoking and altered sleep wake cycle are considered to be the common factors that induce metabolic errors<sup>11</sup>.

The Ahara which is taken in 4 forms namely Ashita Kahadita, Peeta and Leedha<sup>12</sup> finally end up in the

formation of Sapta Dhatu otherwise termed as Dhatu utpatti ktama. The entire process is governed and conducted by the Dhatu ushma, Vayu and Srotas being in their excellence. The 3 levels of Agni, namely Jatharagni, Dhatvagni and Bhutagniplay a key role to support the accomplishment of the process of Dhatu formation as well as entire the metabolic processes. These 3 Agnis at their respective order act upon the Ahara and Ahara rasa to form 2 specific Dhatu components, namely – Sthayi Dhatu and Asthayi Dhatu<sup>13</sup>. The Asthayi Dhatu are nothing but the circulating components which are yet to be converted into Sthayi Dhatu, hence they are also can be called as precursors of the Dhatu. Asthayi means, the Dhatu component which is not stable or constant. It is changing. Whereas Sthayi Dhatu is the one which is completely converted to final form of Dhatu which is stable. Sthayi Dhatu is the one that does Dharana karma of the Shareera.

This way, it is clear that according to the principle of **Dhatavo dhatvaaharah**, the Asthayi form of medo dhatu is the Poshaka bhava

for the Sthayi medo dhatu. In other words, the circulating lipids and lipoproteins are the precursors of the adipose tissue. When the amount of circulating lipids is more, the deposition of the adipose tissue is also relatively increased<sup>14</sup>. And also it is to be noted that, the hypo functioning of the Agni leads to reduction in the metabolic activity and vice versa. Hypo functioning of Medo dhatwagni leads to declined metabolic activity in Medodhatu and favors deposition of excess Medodhatu<sup>15</sup>. Hyper functioning of Medo dhatwagni or otherwise, leads to enhanced metabolic activity resulting in declined deposition of adipose tissue and thereby reducing body fat.

#### **RATIONALE BEHIND OPTING FOR VIRECHANA IN THE CONTEXT:**

Pancha shodhana karma (biopurificatory / cleansing methods) are the prime modes of Ayurvedic methodology of management of morbidities. The fivefold techniques of body purification are specially designed operative procedures in order to cleanse the body and mind internally<sup>16</sup>. These bio purifications allow the various affected

systems and morbid factors to return to homeostasis, there by supporting the revitalization and rejuvenation process instantly through therapeutic cleaning effect of the medicine used for the purpose.<sup>17</sup>

Elimination of waste products and unwanted components is known as Shodhana<sup>18</sup>. These are performed in 3 phases—pre- operative/ preparatory phase, operative /main procedure, and post-operative phase<sup>19</sup>. Virechana karma (therapeutic purgation) is the prime therapeutic cleansing intervention among the Panchakarma procedures<sup>20</sup>. Virechana proves its clinical efficacy in metabolic disorders like obesity, diabetes mellitus and other disorders.<sup>21</sup> It has been clearly mentioned in the classical texts that these procedures, especially Virechana, can act as a curative, preventive, and health-promoting measure.<sup>22</sup> This may be brought about by subtle changes at the cellular level by modulating physiological, biochemical, and immunological activities at the molecular level. Virechana is capable of operating and modulating the bio chemical

components, body fluids, and also fluid and electrolyte balance.

### **VIRECHANA AS TREATMENT OF CHOICE IN....<sup>23</sup>:**

The Virechana karma is considered as treatment of choice or a major impactful intervention in the following conditions like-

- Pitta vikara- due to Vriddhi or Prakopa
- Pttanubandha kapha
- Pittanubandha vata
- Pittasthanagata Anya Dosha
- Pitta Prakriti
- Kapha vikara
- Kapha vata vikara
- Mriduvirechanain vata
- Vata margavaranyaby anya dosha
- Tridoshaja vikara
- Essential treatment in manovahasroto vikara

### **VIRECHANA KARMUKATA:<sup>24</sup>**

- The drugs used for Virechana karma possess the qualities like Ushna, Tikshna, Sukshma, Vyavayi and Vikasi. They reach the Hridaya by virtue of

their own Veerya and from Hridaya they move through the Dhamanis and pervade into the entire body. After reaching the macro and micro channels the Dravya veerya penetrates in to the Dosha complex.

- By virtue of Agneya guna they bring Vishyandana in the doshas and facilitate them to become a solvent component. By virtue of Teekshna guna the dravya veerya disintegrates the doshas and brings them into simpler molecules. The doshas now in disintegrated and dissolved state begin movement towards the Koshtanga as they are not able to stick to the srotas anymore that is in oleated state.
- The veerya of the dravya make the minute channels permeable and thus move towards Amashaya. The Dravya having Agneya and vayu predominance imbibe the power of upward movement, thus inducing Vamana. Whereas the dravya composed of Jala and Prithvi mahabhuta attain the power of downward movement and induce Virechana effect.



**MODUS OPERANDI VIRECHANA KARMA:**

Virechana drugs carry out the therapeutic purgation by virtue of their Prabhava (special attributed potency).

Having stronger composition of Jala and Prithvi Mahabhuta, they have a natural tendency to move downwards and thus Purgation is induced. The

Virechana Dravyas act during their Pachyamana Avastha meaning while they are undergoing the process of digestion.

The morbid Doshas are to be expelled out from their nearest route. Kapha dosha is evacuated by inducing Vamana karma and Pitta dosha through Virechana. The effect of Virechana is brought by 4 major mechanisms.<sup>25</sup>The Process of Anulomana expels the Apakva Mala and thus facilitates Agni deepana in due course. Sramsana removes the Shlishta Mala and clears the Srotas. The Rechana drains the Mala and excess Kledamsha from the body and thus reduces the accumulated Kleda. The Bhedanadoes Mala Bhedana and thus removes the complexity of the Doshas. Thus the waste products wherever present in the body, are forced towards the GIT and expelled which ensures the homogeneity in the gut and also cleansing the intra and extra cellular components of the body.

- When the Virechana Dravya is consumed, it induces mass peristaltic movements in the entire GIT propelling the contents downwards filling the rectum primarily.

- The rectal wall gets distended and in turn stimulates the stretch receptors.
- The stimulation is carried to the CNS to generate the motor impulses which pass through the parasympathetic pathway to reach the descending colon, sigmoid colon, rectum and finally anus.
- These impulses initiate the Defecation reflex to empty the rectum by contracting and shortening the rectum to increase the pressure within.
- This pressure supported by the voluntary contraction of the abdominal wall, diaphragm, opens the internal sphincter of anus and defecation occurs.

When a purgative drug is given it induces hyperemia and acute, mild inflammation by irritating the mucous membrane. Large amount of fat administered during Snehana also induces inflammation in the GIT. The inflamed surface drains the fluid. As the area of the intestine is quite large, the area inflamed is also wide. Therefore this inflammation will become potent enough to drain the contents of the body to a large extent. Various biochemical components, intra cellular and extra cellular fluid, circulating fluid, mobilized fat,



excessively deposited and dissolved contents are effectively drained into the gut and expelled out.

### **DISCUSSION:**

Factors like vaso- active amines, mast cells, platelets, vaso active polypeptides, lysosomal enzymes, prostaglandins lymph node permeability factor etc. induce hyperemia, inflammation, hyper permeability and exudation in the intestines. The purgative (Castor oil) gets hydrolyzed in small intestine by lipase to give ricinoleic acid, which irritates and requires bile for hydrolysis. Bile serves as a means for excretion of several important waste products from the body. These include bilirubin, an end-product of hemoglobin destruction and excesses of cholesterol synthesized by the liver cells. This makes Virechana karma applicable in wide spectrum of diseases particularly the disorders of metabolic error.

- Hypertension
- DM -2, Insulin resistance, Hyperglycemia, Dyslipidemia
- Sthoulya, Medoroga, Prameha, Hridroga, Vatarakta, Amavata,
- Raised CRP, Inflammation
- Cardiac ailments

- Autoimmunity, RA, SLE, CKD
- Anemia, ITP
- Infertility
- Bronchitis, COPD, ILD
- Obstructive / Haemorrhagic stroke

### **VIRECHANA ON PRAMEHA AND STAULYA:**

The therapy showed the decrease fatty acid in the storage like liver, kidney, heart, and adipose tissue can also indirectly increase the insulin sensitivity in insulin receptor present at skeletal muscles and decrease in resistance.<sup>26</sup>

- On bahu abaddha meda, bahu drava shleshma – through Rechana and Sramsana
- Virechana is highly effective on the site of Pitta- Agnistaana

By acting primarily on liver and pancreas it may help to reduce hepatic glucose production and overcome the impaired insulin secretion. Virechana is effective in the management of the metabolic syndrome with decrease in the fecal fat content, fasting blood glucose, serum triglyceride, and reduced fatty changes in liver, heart, and kidney.<sup>26</sup>

Virechana eliminates both Pitta and Kaphamorbidity and Ama meda which removes the Avarana to Vata. Along with Kapha it also eliminates Kapha

dharmiya Dravya accumulated in the body thus clearing the Srotas. The phenomenon of Virechanacauses irritation to the liver and pancreas, which induces raised secretion of intestinal secretin and also Cholecystokinin (CCK). Thus secreted CCK reduces postprandial hyperglycemia without altering post prandial insulinemia in type 2 DM.<sup>27</sup>

Virechana manipulates the gut hormones like peptide YY (PYY), pancreatic polypeptide (PP), glucagon-like peptide 1 (GLP-1), oxyntomodulin (OXM), ghrelin, amylin and cholecystokinin (CCK)<sup>37</sup> by stimulating the pancreas and liver lead to contraction of Gallbladder. These hormones are key mediators that send signals for the food intake to the brain. Raised levels of these hormones modulate the activity of gut- brain axis and modify the appetite, hunger and energy balance in the person, thus contribute to manage obesity.<sup>28</sup>

#### **VIRECHANA DRAINING KLEDAMSHA:**

- ❖ Virechana being minor inflammation of GIT induced intentionally increase permeability.
- ❖ Due to this the permeability of the membrane changes and those substances come out due to the changed permeability which cannot come out in normal condition.

- ❖ Absorption in the GIT occurs by 2 pathways namely paracellular and trans cellular. Ions and water pass through the tight junction between the cells to support absorption and secretion. This is known as paracellular pathway which is made up of small water-filled pores of channels. These channels remain closed during resting state and open and dilate during absorption.

- ❖ In the transcellular mechanism, Na<sup>+</sup> pump present in the basolateral membrane actively transports Na<sup>+</sup> out of the mucosal cells into the intracellular space. The process is reversed during secretion facilitating large amount of fluid drained towards the intestines.

#### **VIRECHANA ON HYPERTENSION**

Rakta chhapa vridhhi may be caused by various pathological events of caused by Pitta, Vata, Dhamani pratichaya, siragata vata, raktavrita vata, medasavrita vata, Rakta dhatu dushti. There may be altered viscosity of blood or cardiac, CNS, vascular or even renal pathology behind. Virechana karma removes load on vessels, reduces the tension and corrects the tissue nutrition levels. By removing excess of sodium ions and

excrete potassium through G.I.T, the bicarbonate, and maintaining electrolyte balance, Virechana proves its efficacy on Hypertention management.<sup>29</sup> Through Virechana, the Angiotensin-II enzyme mechanism is modulated, which helps to reduce retention of salt and water, which decrease extra-cellular fluid from the body, which ultimately decreases blood pressure.<sup>30</sup>

#### **VIRECHANA ON LOW GRADE INFLAMMATION IN THE DHATUS:**

The link between the gastrointestinal endocrine axis and the immune system is established through the interaction of pro-inflammatory cytokines, including TNF- $\alpha$  and the gut hormones. The immune-modulatory role of these gut hormones are capable of modulating the altered cytokine network and autoimmune inflammatory reactions. Thus Virechana prevent stimulation of inflammatory mediators by acting on gut hormones.<sup>31</sup>

#### **CONCLUSION:**

- Virechana is an effective therapeutic procedure to treat Pitta dosha as major target. It is equally beneficial in disorders of Kapha and Vata association, Vata avarana by Kapha pitta, Rakta and Meda dhatu.

- The disease caused by Ati Santarpana are effectively manageable by Virechana by acting upon the Dosha Dhatu and Kleda in the body.
- The Medoroga in terms of Metabolic Syndrome can be efficiently managed through Virechana.
- The phenomenon of purgation induces inflammation in the gut but reduces inflammation in the tissues.
- Virechana plays a major role in management of Metabolic Syndrome –
  - By evacuation of excessively deposited and circulating Lipids, excess fluid accumulated.
  - By acting on Liver and Pancreas as well as insulin resistance and hyperglycemia.
  - By cleansing and rejuvenating the body as well as by improving endurance of body and mind.

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